



Grossmont Union High School District

Foothills Adult Remodel and West Hills Science Renovation Multi-Prime CN-2447 – CN-2459 Addendum 1

Date: March 11, 2021

The following changes, additions, deletions, or corrections shall become a part of the Contract Documents dated March 1, 2021, for the project named above and all other conditions shall remain the same. The bidders shall be responsible for transmitting this information to all affected subcontractors and suppliers prior to the closing of bids.

Pre-Bid RFI Submission date HAS CHANGED to March 16, 2021 @ 2PM.

NO OTHER DATES HAVE CHANGED PRIOR TO THIS DATE IN THE SCHEDULE.

CHANGES TO CONTRACT DOCUMENTS

- Item 1: **Attachment C:** Removed BP 07 Glazing and added the entire Glazing and Storefront scope of work under BP 08 Finishes. All specifications listed in the Dot Matrix under BP 07 Glazing, are hereby assigned to BP 08 Finishes. See enclosed, updated BP 08 Finishes division of work section and updated Dot Matrix. In Attachment C, inclusion items 2.8.158 through 2.8.196 have been added. NOTE: Bid Package 07 estimate value to be added to BP 08 estimate value, see additional attachment provided herein.
- Item 2: **Attachment C:** Scope added to BP 03 Plumbing to cover the railings at eye wash station and similar as required. See inclusion 2.3.29 and updated Dot Matrix for WHHS.
- Item 3: **Attachment C:** Updated Dot Matrix for WHHS and FAEC; added specification and scope re-assignments to BP 8.
- Item 4: **Front End Documents:** Clarification; District **will** provide Builders Risk.

CHANGES TO DRAWINGS

- Item 1: DSA Approved WHHS Plans, dated March 11, 2021.

CHANGES TO SPECIFICATIONS

Item 1: DSA Approved WHHS Specifications, dated March 11, 2021.

CLARIFICATIONS

Item 1: Pre-Bid RFI Answer Log

SUPPLEMENTARY ATTACHMENTS

Item 1: Job Walk Sign-in Sheets and DVBE Advertisements

Item 2: WHHS FAEC Bid Package Estimates

Chris Rizzuti, Sr. Project Manager
GUHSD



March 11, 2021

ADDENDUM NO. 1

TO THE CONTRACT DOCUMENTS

FOR

WEST HILLS SCIENCE BUILDING MODERNIZATION

FOR THE
GROSSMONT UNION HIGH SCHOOL DISTRICT
1100 Murray Drive
El Cajon, CA 92020

DSA #04-119771 FILE #37-H4 RCA Job No. 1-30-50

NOTICE TO BIDDERS

This Addendum releases the Approved Drawings and Specifications approved by DSA on March 10th, 2021.

Acknowledge receipt of Addendum No. 1 in the space provided on the Bid Form. Failure to do so may subject bidder to disqualification.

GENERAL

- Item No. 1.1 Reference Attached DSA Approved Plans and Specifications:
- 1.1.1 DSA Approved Plans and Specifications to be released as Bid Set.

ATTACHMENTS

DSA Approved Plans and Specifications

END OF ADDENDUM A

David Ruhnau, Principal

#C-20662



Attachment C - Bid Package 3
Plumbing and Underground Utilities
Supplementary Special Provisions

BID PACKAGE #03 – PLUMBING & UNDERGROUND UTILITIES DIVISION OF WORK

- 2.3. **BID PACKAGE #03 – “PLUMBING & UNDERGROUND UTILITIES”** – Prime Contractor is responsible for coordinating and providing all plant, labor, material, equipment, tools, facilities, transportation, applicable taxes, permits, services and coordination necessary for, and incidental to accomplish the work (unless specifically noted otherwise), in accordance with the complete contract documents, and ensure coordination of work between the multiple bid packages for a complete turnkey and operable system at the school sites Foothills Adult Education Center (FAEC) & West Hills HS Science Bldg. (WHHS) Modernization projects, which shall include, but not be limited to the following;
- 2.3.1 FAEC | As-Built Documents | Attachment O
 - 2.3.2 FAEC | Titan ES | Technical Specifications | Attachment G
 - 2.3.3 FAEC | Titan ES | Hazardous Materials Survey Report & Floor Plan | Attachment H
 - 2.3.4 FAEC | Titan ES | Hazardous Materials Abatement Specifications | Attachment I
 - 2.3.5 FAEC | Ruhnau Clarke Architects | Drawings | Attachment E
 - 2.3.6 FAEC | Ruhnau Clarke Architects | Specifications
 - 2.3.7 FAEC | Ruhnau Clarke Architects | 00 00 00 – Procurement & Contracting Requirements - Complete
 - 2.3.8 FAEC | Ruhnau Clarke Architects | 01 00 00 – General Requirements – Complete
 - 2.3.9 FAEC | Ruhnau Clarke Architects | 02 41 00 - Demolition
 - 2.3.10 FAEC | Ruhnau Clarke Architects | 07 92 00 – Joint Sealants
 - 2.3.11 FAEC | Ruhnau Clarke Architects | 08 31 00 - Access Doors and Panels
 - 2.3.12 FAEC | Ruhnau Clarke Architects | Division 22 – Plumbing – Complete
 - 2.3.13 FAEC | Ruhnau Clarke Architects | 31 23 16.13 – Trenching
 - 2.3.14 GUHSD | Front End Bid & Contract Documents
 - 2.3.15 WHHS | As-Built Documents | Attachment N
 - 2.3.16 WHHS | Group Delta | Hazardous Building Material Abatement Specifications | Attachment J
 - 2.3.17 WHHS | Group Delta | Technical Lead-Related Specifications | Attachment F
 - 2.3.18 WHHS | Ruhnau Clarke Architects | Drawings | Attachment D
 - 2.3.19 WHHS | Ruhnau Clarke Architects | Specifications
 - 2.3.20 WHHS | Ruhnau Clarke Architects | 00 00 00 – Procurement & Contracting Requirements - Complete
 - 2.3.21 WHHS | Ruhnau Clarke Architects | 01 00 00 – General Requirements - Complete
 - 2.3.22 WHHS | Ruhnau Clarke Architects | 07 92 00 – Joint Sealants
 - 2.3.23 WHHS | Ruhnau Clarke Architects | 08 31 00 - Access Doors and Panels
 - 2.3.24 WHHS | Ruhnau Clarke Architects | Division 22 – Plumbing – Complete
 - 2.3.25 FAEC & WHHS | Temporary Site Water

 - 2.3.26 This Prime Contractor is responsible for coordinating, laying out, providing and installing all underground utilities and plumbing complete, including but not limited to water utilities, sanitary sewer, condensate piping, sleeves, escutcheons, meters, gages, hangers, supports, vibration and seismic controls, identification, piping insulation, domestic water, piping, pumps, sanitary waste and vent, fixtures, toilets, urinals, lavatories, sinks, roof drains (including reconnection of existing), trap primers, water hammer arresters, hose bibs and all necessary accessories and sundry items required for a complete and operable system, valves, unions, vents, etc. per contract documents.

BID PACKAGE #03 – PLUMBING & UNDERGROUND UTILITIES DIVISION OF WORK

- 2.3.27 This Prime Contractor is responsible for coordinating, laying out, providing and installing all plumbing fixtures including but not limited to sink assemblies, lavatories, drinking fountains, water heaters (including relocation of existing water heaters), floor sinks, faucets, floor drains, flush valves, hose bibs, overflow drains, recirculating pumps, urinals, water closets and all necessary accessories and sundry items required for a complete and operable system, per contract documents.
- 2.3.28 This Prime Contractor is responsible for **removing, storing & reinstalling** all plumbing fixtures, appliances and equipment shown to remove and *reinstall* after improvements are complete, including but not limited to urinals, water closets, sinks, water heaters, etc. Coordinate this activity to occur before the Demolition Prime Contractor starts their work. This Prime Contractor responsible for keeping items shown to reinstall in a secured, clean and dry storage area located on site.
- 2.3.29 This Prime Contractor responsible for coordinating, laying out, providing and installing all laboratory equipment noted in WHHS keynotes as "22.xxx", including but not limited to laboratory station sink w/ faucet, glass washer, accessible sink w/ faucet, gas/air turret, accessible eye wash/face wash/shower equipment and reinstallation of existing laboratory equipment if shown to relocate. Ensure all items are fully functioning and complete. **This Prime Contractor responsible for all related railings and/or hand bars, shown as part of ADA compliance for equipment, i.e. railings at accessible eye wash/face wash/shower. Specification 05 52 13 Pipe and Tube Railings added to this Prime Contractor's scope and to the WHHS Dot Matrix.**
- 2.3.30 This Prime Contractor is responsible to connect to building plumbing systems, equipment requiring water connection. This includes but is not limited to refrigerator, glass washer, ice machine, and other items shown as CFCI, OFCI and existing to relocate, that requires water connection to properly function.
- 2.3.31 This Prime Contractor is responsible for coordinating and protecting all existing utilities scheduled to remain. Take appropriate precautions when performing work in areas of existing utilities. Any damage done to known utilities will be repaired by this Plumbing Prime Contractor, at no cost to the project.
- 2.3.32 This Prime Contractor is obligated to test all existing lines supply, return and waste lines at both projects to confirm fully functional before connecting new pipe and systems to existing. See 2.3.55 and 2.3.57 for additional requirements.
- 2.3.33 This Prime Contractor is responsible for coordinating, laying out, engineering, providing and installing all shoring, and bracing necessary to protect existing buildings, stem walls, foundations, streets, walkways, sidewalks, utilities and other improvements and excavation against loss of ground or caving embankments.
- 2.3.34 This Prime Contractor is responsible for providing dewatering measures for duration of underground work. It should be assumed that water will be encountered during even shallow underground activities. Full responsibility to properly divert water, complying with all SWPPP and City Regulations, belongs to this Prime Contractor. All water to be diverted outside of interior spaces. Interior finishes shall all remain protected from water or damage associated with this activity.
- 2.3.35 This Prime Contractor is responsible for coordinating, laying out, providing and installing building water distribution piping, all plumbing fixtures, equipment and all necessary accessories and sundry items required for a complete and operable building plumbing system per the contract documents.



BID PACKAGE #03 – PLUMBING & UNDERGROUND UTILITIES DIVISION OF WORK

- 2.3.36 This Prime Contractor is responsible for coordinating, laying out, providing, installing, protecting, maintaining construction water for all project phases including but not limited to providing and removing one (1) temporary site water risers at each site for use by all Prime Contractors during construction. This Prime Contractor is responsible to provide, install and maintain one connection to the existing domestic water system, at each site and backflow assembly for use by all Prime Contractors during construction.
- 2.3.37 This Prime Contractor is responsible for coordinating, laying out, providing and installing the domestic water system complete, including but not limited to piping, tracer wire, valves, fittings, thrust blocks, marker tape, valve boxes, junction chambers, back flow preventers and cages, concrete pads and all necessary accessories and sundry items required for a complete and operable system, per contract documents, including but not limited plans, specifications, soils report, etc.
- 2.3.38 This Prime Contractor is responsible for coordinating, providing and installing j-clamps at all sinks, with a sealant between the sink and the countertop.
- 2.3.39 This Prime Contractor is responsible to coordinate and provide chlorination or sterilization of water systems as required, including certification.
- 2.3.40 This Prime Contractor is responsible for coordinating, providing and installing all excavation, dewatering, shoring, bedding material, backfill and compaction for own work, per contract documents. Subgrade final compaction elevation shall be coordinated with Concrete Prime Contractor.
- 2.3.41 This Prime Contractor is responsible to provide insulation of own work.
- 2.3.42 This Prime Contractor is responsible for coordinating, laying out, providing and installing sanitary sewer system complete including but not limited to all waste system, piping, cleanouts, boxes, appurtenances, connecting to existing city system, and all necessary accessories and sundry items required for a complete and operable system, per contract documents, including but not limited to plans, specifications and soils report, etc.
- 2.3.43 This Prime Contractor responsible for all layout, survey and staking as required for own work.
- 2.3.44 This Prime Contractor is responsible for returning all areas previously graded back to its original state after underground utilities have been installed. This Prime Contractor responsible for rock removal, for own work.
- 2.3.45 This Prime Contractor is responsible to provide import backfill material, if required due to unsuitability of onsite materials or not enough material to meet grade.
- 2.3.46 This Prime Contractor is responsible for coordinating, laying out, providing and installing all miscellaneous metal and hardware (i.e., grates, frames, covers, ladder rungs, etc.), as required for own work.
- 2.3.47 This Prime Contractor is responsible for immediately removing their own spoils. Stockpiles will not be allowed unless otherwise authorized by the Construction Manager and/or required for follow-on work. This Prime Contractor is responsible for tarp or heavy polyethylene and sandbags covering stockpile spoils while it is being generated, and maintenance of same, as required by SWPPP compliance regulation (if stockpiling indoors is authorized by the Construction Manager) and shall be stored in such a manner that all interior conditions are protected and kept free from dirt, dust, debris, until removal of spoils.
- 2.3.48 This Prime Contractor to remove and immediately dispose of spoils from site, including their tarp, heavy polyethylene, sandbags and hay bales, that was utilized to cover own stockpiled soils, as coordinated and directed by the Construction Manager. Site is tight, stock piles will not be allowed.

BID PACKAGE #03 – PLUMBING & UNDERGROUND UTILITIES DIVISION OF WORK

- 2.3.49 This Prime Contractor is responsible for coordinating, laying out, providing and installing slurry at underground plumbing utilities that cross under footings per structural details. Coordinate the bottom of footing elevation with Concrete Prime Contractor.
- 2.3.50 This Prime Contractor is responsible for coordinating, laying out, providing and installing all concrete associated with own work, if not shown as new in contract documents (if shown as new concrete, responsibility remains with BP #4 CONCRETE) including but not limited to precast, cast-in-place, reinforcing, manholes, cleanouts, encasements, thrust blocks, etc. Includes patch back for walkways, flatwork, etc.
- 2.3.51 This Prime Contractor is responsible for dust control during own operations.
- 2.3.52 In the event of inclement weather forecasts, this Prime Contractor is responsible for coordinating, providing, installing, maintaining and removing temporary rain protection due to own work, such as visqueen, to protect finishes below. This Prime Contractor shall ensure there is no ponding and water drains off roof.
- 2.3.53 This Prime Contractor is responsible to provide all pressure tests, cross connection tests, purging, analyzing, and test reports of systems as required.
- 2.3.54 All underground utilities shall be installed and tested prior to finish work.
- 2.3.55 This Prime Contractor is responsible to provide all flushing, testing, chlorination, inspection, balancing and maintenance of own work until Owner acceptance.
- 2.3.56 This Prime Contractor is responsible to provide and install joint sealants, fire sealants, sleeves, sleeve seals, escutcheons, beauty rings, flashing, meters and gages, valves, seismic anchorage, bracing, vibration isolation, embeds, inserts, anchors, sleepers, hangers, supports, and backing plates for own work as required.
- 2.3.57 **This Prime Contractor is responsible for jetting of all sewer lines prior to start of work to confirm system is fully functioning before beginning improvements and shall jet all sewer lines again at end of project.** Pressure jetting to be from each input on site to point of connection at street. Jetting of sewer system will also include branch lines from all bathrooms and all main trunk lines inside the building. After jetting is complete, lines are to be videoed with a camera with copy of video turned over to district. The Construction Manager to be notified 48 hours in advance of any jetting and / or video activity.
- 2.3.58 This Prime Contractor is responsible for reconnecting any condensate drain systems disconnected as part of the work and ensuring reconnections are tested and confirmed fully functioning.
- 2.3.59 This Prime Contractor is responsible for connecting laboratory equipment shown as CFCl, under Division 11, and existing or Owner Furnished appliances, to building water supply, as required.
- 2.3.60 This Prime Contractor is responsible for coordinating, laying out, providing and installing blocking required to support own work.
- 2.3.61 This Prime Contractor is responsible for coordinating, laying out, providing and installing sealants, caulking, and fire stopping at own penetrations. Provide caulking at all dissimilar materials.
- 2.3.62 This Prime Contractor is responsible for coordinating, laying out, providing and installing fire stopping associated with own work. All Fire Stopping shall be "RED" in color for identification purposes. As a part of the submittal process, this Prime Contractor shall provide UL details for all penetrations, for own work. If a UL detail is not available for a specific penetration related to this Prime Contractor's work, it will be this Prime Contractor's responsibility to have an evaluation and prescription provided for all special penetrations.
- 2.3.63 This Prime Contractor is responsible to provide and install identification of own work as required.

BID PACKAGE #03 – PLUMBING & UNDERGROUND UTILITIES DIVISION OF WORK

- 2.3.64 This Prime Contractor is responsible for coordinating, laying out, providing and installing own access doors and panels, as required per code whether shown on the contract drawings or not, and is responsible for coordinating and providing other Prime Contractors with coordination drawings, rough-in drawings and detailed working drawing for coordination, layout and rough-in requirements.
- 2.3.65 This Prime Contractor is responsible to provide and install own sleeving and blockouts at wall, and floor penetrations and mechanical sleeve seals for own work. Coordinate with Concrete, Finishes and Rough Carpentry Prime Contractors as required.
- 2.3.66 This Prime Contractor is responsible to provide a competent person onsite during all concrete pours to monitor own work and ensure components in concrete are not disturbed and are at proper elevation and configuration.
- 2.3.67 This Prime Contractor is responsible to provide coring, cutting and drilling for own penetrations in any surface should Prime Contractor fail to install sleeves or block-outs or fail to layout in advance.
- 2.3.68 This Prime Contractor shall excavate, backfill, cap off and remove/demo its respective underground utilities. Removal of above-ground utilities shall be provided by the Demolition Prime Contractor after being capped and safed off by this Prime Contractor.
- 2.3.69 This Prime Contractor shall coordinate with all applicable Prime Contractors, including the Demolition Prime Contractor to expose all Above-Ground Utilities that are required to be safed off, capped off and/or relocated for this plumbing scope of work.
- 2.3.70 This Prime Contractor is responsible to provide and install flashing, caulking and sheet metal associated with own work. This Prime Contractor is responsible to provide and install dissimilar material and corrosion protection.
- 2.3.71 This Prime Contractor is responsible coordinate and provide final water temperature adjustments, prior to completion of work, to ensure equipment is set to specified water temperature requirements. In the absence of a requirement, this Prime Contractor shall submit an RFI.
- 2.3.72 This Prime Contractor is responsible to provide operational testing and instruction to Owner's personnel. Submit certificate of compliance signed by Owner's representative to Construction Manager upon completion of instruction for each site.
- 2.3.73 This Prime Contractor is responsible for providing one qualified laborer for a total of **20 hours for WHHS** and **20 hours for FAEC** for additional clean up while performing work on site per schedule as directed by Construction Manager. Each Prime Contractor still responsible for cleanup of own work. All hours to be directed and documented by Construction Manager. All unused hours will be credited back, via deductive change order.
- 2.3.74 This Prime Contractor shall coordinate their Work above ceiling, in chases, under slab, and in wall systems with the Work of other trades to insure proper space utilization and conformance with the requirements of the Contract Documents. Conflicts arising from this Prime Contractor's failure to coordinate will be the responsibility of this Prime Contractor to resolve. All applicable Prime Contractor's shall jointly prepare, with HVAC and Plumbing, Electrical, Framing, and all other pertinent Prime Contractors to overlay drawings indicating the vertical and horizontal routing of pipes, bracing and accessories so as to avoid any conflicts. All applicable Prime Contractor's, including but not limited to Mechanical HVAC, Electrical, Plumbing, will be responsible for attending weekly and or bi-weekly MEP coordination and/or BIM meetings. This Prime Contractor understands that the coordination and/or BIM meetings may begin prior to mobilization on site.

END OF BID PACKAGE

**BID PACKAGE #08 – FINISHES, CEILINGS, DRYWALL, PLASTER, DOOR FRAMES, ACCESS DOORS,
HARDWARE, INSULATION, PAINT & FINAL CLEAN DIVISION OF WORK**

- 2.8. **BID PACKAGE NUMBER #08 – FINISHES, CEILINGS, DRYWALL, PLASTER, DOOR FRAMES, ACCESS DOORS, HARDWARE, INSULATION, PAINT & FINAL CLEAN & STOREFRONT & GLAZING** – Prime Contractor is responsible for coordinating and providing all plant, labor, material, equipment, tools, facilities, transportation, applicable taxes, permits, services and coordination necessary for, and incidental to accomplish the work (unless specifically noted otherwise), in accordance with the complete contract documents, and ensure coordination of work between the multiple bid packages for a complete turnkey and operable system at the schools site Foothills Adult Education Center (FAEC) & West Hills HS Science Bldg. (WHHS) Modernization projects, which shall include, but not be limited to the following;
- 2.8.1 FAEC | As-Built Documents | Attachment O
 - 2.8.2 FAEC | Titan ES | Technical Specifications | Attachment G
 - 2.8.3 FAEC | Titan ES | Hazardous Materials Survey Report & Floor Plan | Attachment H
 - 2.8.4 FAEC | Titan ES | Hazardous Materials Abatement Specifications | Attachment I
 - 2.8.5 FAEC | Ruhnau Clarke Architects | Drawings | Attachment E
 - 2.8.6 FAEC | Ruhnau Clarke Architects | Specifications
 - 2.8.7 FAEC | Ruhnau Clarke Architects | 00 00 00 – Procurement & Contracting Requirements - Complete
 - 2.8.8 FAEC | Ruhnau Clarke Architects | 01 00 00 – General Requirements - Complete
 - 2.8.9 FAEC | Ruhnau Clarke Architects | Division 05 – Metals - Complete
 - 2.8.10 FAEC | Ruhnau Clarke Architects | 06 83 16 - Fiberglass Reinforced Paneling
 - 2.8.11 FAEC | Ruhnau Clarke Architects | Division 07 - Thermal and Moisture Protection - Complete
 - 2.8.12 FAEC | Ruhnau Clarke Architects | 08 06 71 - Door Hardware Schedule
 - 2.8.13 FAEC | Ruhnau Clarke Architects | 08 11 13 - Hollow Metal Doors and Frames
 - 2.8.14 FAEC | Ruhnau Clarke Architects | 08 31 00 - Access Doors and Panels
 - 2.8.15 FAEC | Ruhnau Clarke Architects | 08 71 00 - Door Hardware
 - 2.8.16 FAEC | Ruhnau Clarke Architects | 09 21 16 - Gypsum Board Assemblies
 - 2.8.17 FAEC | Ruhnau Clarke Architects | 09 22 36 - Lath
 - 2.8.18 FAEC | Ruhnau Clarke Architects | 09 24 00 – Cement Plastering
 - 2.8.19 FAEC | Ruhnau Clarke Architects | 09 51 00 - Acoustical Ceilings
 - 2.8.20 FAEC | Ruhnau Clarke Architects | 09 72 00 - Wall Coverings
 - 2.8.21 FAEC | Ruhnau Clarke Architects | 09 72 16.26 - Architectural Vinyl Graphic Films
 - 2.8.22 FAEC | Ruhnau Clarke Architects | 09 72 60 - Resilient Tackable Wall Covering
 - 2.8.23 FAEC | Ruhnau Clarke Architects | 09 84 30 - Sound-Absorbing Wall and Ceiling Units
 - 2.8.24 FAEC | Ruhnau Clarke Architects | 09 91 13 - Exterior Painting
 - 2.8.25 FAEC | Ruhnau Clarke Architects | 09 91 23 - Interior Painting
 - 2.8.26 FAEC | Ruhnau Clarke Architects | 10 26 00 - Wall and Door Protection
 - 2.8.27 GUHSD | Front End Bid & Contract Documents
 - 2.8.28 WHHS | As-Built Documents | Attachment N
 - 2.8.29 WHHS | Group Delta | Hazardous Building Material Abatement Specifications | Attachment J
 - 2.8.30 WHHS | Group Delta | Technical Lead-Related Specifications | Attachment F

**BID PACKAGE #08 – FINISHES, CEILINGS, DRYWALL, PLASTER, DOOR FRAMES, ACCESS DOORS,
HARDWARE, INSULATION, PAINT & FINAL CLEAN DIVISION OF WORK**

- 2.8.31 WHHS | Ruhnau Clarke Architects | Drawings | Attachment D
- 2.8.32 WHHS | Ruhnau Clarke Architects | Specifications
- 2.8.33 WHHS | Ruhnau Clarke Architects | 00 00 00 – Procurement & Contracting Requirements - Complete
- 2.8.34 WHHS | Ruhnau Clarke Architects | 01 00 00 – General Requirements – Complete
- 2.8.35 WHHS | Ruhnau Clarke Architects | 05 05 19 – Post Installed Concrete Anchors
- 2.8.36 WHHS | Ruhnau Clarke Architects | 05 50 00 – Metal Fabrications
- 2.8.37 WHHS | Ruhnau Clarke Architects | 06 83 16 - Fiberglass Reinforced Paneling
- 2.8.38 WHHS | Ruhnau Clarke Architects | Division 07 - Thermal and Moisture Protection - Complete
- 2.8.39 WHHS | Ruhnau Clarke Architects | Division 08 – Openings - Complete
- 2.8.40 WHHS | Ruhnau Clarke Architects | 09 21 16 - Gypsum Board Assemblies
- 2.8.41 WHHS | Ruhnau Clarke Architects | 09 22 36 - Lath
- 2.8.42 WHHS | Ruhnau Clarke Architects | 09 24 00 - Cement Plastering
- 2.8.43 WHHS | Ruhnau Clarke Architects | 09 51 00 - Acoustical Ceilings
- 2.8.44 WHHS | Ruhnau Clarke Architects | 09 91 13 - Exterior Painting
- 2.8.45 WHHS | Ruhnau Clarke Architects | 09 91 23 - Interior Painting
- 2.8.46 WHHS | Ruhnau Clarke Architects | 09 96 00 - High-Performance Coatings
- 2.8.47 WHHS | Ruhnau Clarke Architects | 10 26 00 - Wall and Door Protection
- 2.8.48 FAEC & WHHS | Temporary Restroom & Handwash Facilities
- 2.8.49 FAEC & WHHS | Dumpsters & Site Trash
- 2.8.50 FAEC & WHHS | Construction Fire Extinguishers
- 2.8.51 FAEC & WHHS | Site Construction Signage
- 2.8.52 FAEC & WHHS | Final Cleaning
- 2.8.53 FAEC & WHHS | COVID Temperature & Check-in Station

- 2.8.54 This Prime Contractor is responsible for coordinating, receiving, unloading, inventorying, storing, transporting, protecting and installing all materials for own work.
- 2.8.55 This Prime Contractor responsible to provide floor protection for hallways, rooms and other paths of travel utilized by all Prime Contractors to access and perform their work at both campuses. This Prime Contractor responsible for protection and cover of existing doorways and walls adjacent to areas scheduled to be improved so as to properly protect existing building finishes that aren't scheduled to be improved as part of project scope at both sites. Protection measures shall also include thresholds from interior to exterior, sidewalk and asphalt as required. Existing doors may need to be removed and reinstalled as required to eliminate damage.
- 2.8.56 This Prime Contractor is responsible for coordinating, laying out, providing and installing all cold-formed metal framing, metal studs and light gauge framing complete, including but not limited to blocking, lintels, angels, shoes, reinforcements, furring channels, anchor bolts, epoxy anchors, shot pins, tabs, clips, backing, straps, slip track, fire track, hat channel, ceiling channel, runners, wires, fasteners, bracing, welding, welding of clips and metal framing components to structural supports, and all associated items required for a complete installation per contract documents and reference and industry standards. Including any gauge material required for metal stud framing backing. All backing required for FAEC is the responsibility of this Contractor.

**BID PACKAGE #08 – FINISHES, CEILINGS, DRYWALL, PLASTER, DOOR FRAMES, ACCESS DOORS,
HARDWARE, INSULATION, PAINT & FINAL CLEAN DIVISION OF WORK**

- 2.8.57 This Prime Contractor is responsible for coordinating, laying out, providing and installing cement plastering patching system complete, at all areas required including but not limited to lath, polymer modified fiber reinforced scratch and brown coats, stucco coat, finish coat, integral color, primer, bond compound, crack patching compound, hydrated lime, hand trowel acrylic elastomeric membrane, weather barrier, etc., for a complete system, per contract documents. Patching of plaster to match in texture, finish and color, the existing plaster and blended appropriately so that patch is not identifiable.
- 2.8.58 This Prime Contractor is responsible for coordinating, laying out, providing and installing all plaster control joints per the Contract Documents and as required to prevent cracking in accordance with the plaster industry recommendations. If additional joints are required, provide Construction Manager with written notice prior to installing them. Prior to installation of the plaster systems, have a representative of the Plaster Institute review all control joints and issue a letter indicating acceptance.
- 2.8.59 This Prime Contractor is responsible for coordinating, laying out, providing and installing all aluminum trims/reveals/moldings/fry metal as required for a complete and finished installation per the Contract Documents.
- 2.8.60 This Prime Contractor is responsible for coordinating, laying out, providing and installing all cleanup and remove from site all excess plaster residue at the completion of brown coat and the completion of the finish coat, or as directed by the Construction Manager.
- 2.8.61 This Prime Contractor is responsible for coordinating, laying out, and providing daily and continuous clean-up of all work. Additionally, provide final clean-up including washing of floors and adjacent surfaces.
- 2.8.62 Include caulking / repair of any penetrations and tears in the building paper.
- 2.8.63 Include caulking of all window and door frames and all wall penetrations.
- 2.8.64 This Prime Contractor is responsible for coordinating, laying out, providing and installing lathing including metal lath, underlayment, building felt, paper, self-adhesive vapor barriers and weather barriers, Tyvek wrap, beads, screeds, vents, soffits, soffit vents, vent screeds per contract documents, casings, reinforcement mesh, fasteners, adhesives, reglets, fry metal control and expansion joints, wires, reveals, jiffy seal etc. as required for a complete system.
- 2.8.65 This Prime Contractor is responsible for any underlayment, weather barrier, membrane, waterproofing, jiffy seal, building wrap, flexible flashing, seam tape, sealants, adhesives, fasteners, etc. shown to be installed behind the plaster system and at door openings, etc. per contract documents to achieve a complete, finished system.
- 2.8.66 This Prime Contractor is responsible for coordinating, providing and installing of weep screeds including 24-gauge horizontal sheet metal. Note: Concrete Prime Contractor to layout and snap lines for weep screeds and ensure that proper elevation is maintained where in relation to adjoining concrete.
- 2.8.67 This Prime Contractor is responsible for preparation of finish surfaces to receive own work per contract documents.
- 2.8.68 This Prime Contractor is responsible to remove and dispose of excess plaster left on the ground. Rake clean and return grade to original state. Plaster may not contact the ground. This Prime Contractor shall provide the means necessary (visqueen, waterproof paper, etc.) to prevent all excess plaster from contacting the ground as a SWPPP compliance measure.

**BID PACKAGE #08 – FINISHES, CEILINGS, DRYWALL, PLASTER, DOOR FRAMES, ACCESS DOORS,
HARDWARE, INSULATION, PAINT & FINAL CLEAN DIVISION OF WORK**

- 2.8.69 This Prime Contractor is responsible to inspect all surfaces to receive own work. Promptly notify Construction Manager of any unsuitable substrate conditions. Commencement of installation implies acceptance of all substrate conditions.
- 2.8.70 This Prime Contractor is responsible for all miscellaneous metals, anchors, metal fabrications, pipe & tube railing, as shown on the plans and required per project specifications, for both campuses. There is no Metals Prime Contractor. All anchors and other elements called out in Division 5 shall be the responsibility of this Prime Contractor.
- 2.8.71 This Prime Contractor is responsible for coordinating, laying out, providing and installing FRP where shown and required at both sites.
- 2.8.72 This Prime Contractor is responsible for coordinating, laying out, providing and installing parapet cap, which includes patch/repair/paint of existing exterior plaster walls to match.
- 2.8.73 This Prime Contractor is responsible for coordinating, laying out, providing and installing roofing patch & repair, sheet metal flashing & trim and weather barriers as required per project documents and Division 7 specifications.
- 2.8.74 This Prime Contractor is responsible for coordinating, laying out, providing and installing gypsum board, cementitious backer board, dens shield, durock, hardi-board, moisture/mold resistant board, gypsum liner panels, all exterior gypsum board, densdeck and all dens-glass, fasteners, and wall and door protection, joint treatment material, metal trim, fasteners, adhesives, texture and accessories including drywall behind tackable wall panels and other specialty items, as required per contract documents.
- 2.8.75 This Prime Contractor is responsible for coordinating, laying out, providing and installing all mold resistant drywall for all top down priority walls and ceiling drywall areas.
- 2.8.76 This Prime Contractor is responsible for coordinating, laying out, providing and installing all rated enclosures, soffits, shafts, etc., for plumbing, electrical, HVAC ducting/piping, kitchen and other items as required by the Contract Documents.
- 2.8.77 This Prime Contractor is responsible for coordinating, laying out, providing and installing all final drywall configurations will match adjacent surfaces and be true and flush with adjacent construction. This may require custom sizes and/or shimming/furring as required.
- 2.8.78 This Prime Contractor is responsible for coordinating, laying out, providing and installing all sealants as required for use with this Bid Package including all necessary sealants where drywall or like material meets other materials including door and window frames, tile end caps, etc.
- 2.8.79 This Prime Contractor is responsible for coordinating, laying out, providing and installing all access doors and panels indicated on the Architectural Drawings, and installation only for all access doors/panels/hatches provided by other trades as required by actual job conditions.
- 2.8.80 This Prime Contractor is responsible for coordinating, laying out, providing and installing of four (4) extra access doors and/or panels, two (2) for each site, to be directed by the Construction Manager. All unused access panels shall be credit back to the Construction Manager via a deductive change order.
- 2.8.81 This Prime Contractor is responsible for coordinating, laying out, providing and installing all thermal and acoustical insulation and sealants associated with its work, as required by the Contract Documents.

**BID PACKAGE #08 – FINISHES, CEILINGS, DRYWALL, PLASTER, DOOR FRAMES, ACCESS DOORS,
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- 2.8.82 All fire/smoke rated construction shall maintain continuous required ratings at all areas including penetrations, intersections of dissimilar construction, i.e., concrete, steel, etc. Include fire-safing, fire barrier sealants, drywall/taping compound etc. as required by the Contract Documents and by code requirements.
- 2.8.83 This Prime Contractor is responsible for coordinating, laying out, providing and installing finish tape behind all equipment/fixtures, etc. as is consistent with the taping requirements of the area in question i.e. do not merely fire tape behind these areas.
- 2.8.84 This Prime Contractor is responsible for providing 200 labor hours, and the required material for patching of drywall work and painting, due to trade damage: 100 hours for each site. This is to be directed and signed for by the Construction Manager and is **in addition to all other included touch up required as part of your own activities**. All unused hours shall be credited back to the District.
- 2.8.85 This Prime Contractor to coordinate, layout, provide and install all interior drywall board and finishing (including texture) as required by the Contract Documents. Provide flat taped joints and surfaces on drywall backing board located behind ceramic tile. Provide fire rated and moisture resistant board & compounds where required by code and the Contract Documents. Include all trims, accessories, casings, corner/edge trims, texturing, reveals, moldings, etc. as required by the Contract Documents and for a complete job.
- 2.8.86 This Prime Contractor to coordinate, layout, provide and install all drywall & patching work at openings/penetrations required for other trades and equipment, i.e. ducts, fire dampers, pipes, conduits, lights, doors, frames, J-boxes, skylight shafts, draft stops, etc. This Prime Contractor is responsible to coordinate with other trades to assure that all such openings are properly located and sized and that they are laid out in a timely manner.
- 2.8.87 This Prime Contractor to coordinate, layout, provide and install all draft stopping, firesafing, and firestopping at walls, ceilings, floors, wall section, etc. as per the Contract Documents and as required by code.
- 2.8.88 This Prime Contractor is responsible for coordinating, laying out, providing and installing gypsum board fire rated enclosures for recessed light fixtures, electrical panels, etc., as required.
- 2.8.89 This Prime Contractor is responsible for coordinating, laying out, providing and installing all fasteners, adhesives, accessories and sundry items as required for a complete installation per contract documents.
- 2.8.90 This Prime Contractor is responsible for coordinating, laying out, providing and installing all joint sealers, as required.
- 2.8.91 This Prime Contractor is responsible for coordinating, laying out, providing and installing all thermal and acoustical insulation, fire safing, radiant heat barriers and insulation including, but not limited to batt, blanket, rigid (except at roofing application), acoustical, fire retardant, isolation, sag wires, stick pins, and all auxiliary insulation materials per contract documents and as required for a complete installation.
- 2.8.92 This Prime Contractor is responsible for coordinating, laying out, providing and installing head and bottom of wall acoustic and thermal installations including, but not limited to sealants, insulation, mineral wool and filler material per contract documents and as required for a complete installation.
- 2.8.93 This Prime Contractor is responsible for coordinating, laying out, providing and installing all adhesives, fasteners, tape, stick pins, wires, rods, wire mesh and accessories as required for a complete installation of insulation throughout at both horizontal and vertical installations.

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- 2.8.94 This Prime Contractor is responsible to repair damaged drywall and prepare for repaint as necessary, after installation of all finishes, but before punchlist.
- 2.8.95 Drywall preparation should include measures so that tape joints are not visible through paint finishes, and the drywall finish shall be at the level specified when viewed under high intensity lighting. Meet finish level specified at each campus per project documents, including matching existing.
- 2.8.96 This Prime Contractor is responsible for coordinating, laying out, providing and installing all caulking between all frames, including but not limited to hollow metal frames and any adjoining finish surface or connection to another Prime's finish work.
- 2.8.97 This Prime Contractor is responsible for coordinating, laying out, providing and installing sealants, caulking, and fire stopping at own penetrations. Provide caulking at all dissimilar materials.
- 2.8.98 This Prime Contractor is responsible for preparation of finish surfaces to receive own work and work of others per contract documents. Coordinate openings with Glazing and other Prime Contractors.
- 2.8.99 This Prime Contractor shall exercise special care to avoid damage to other trades finishes. This Prime Contractor will be held responsible for repairs and cleaning resulting from damage by careless operations and installation.
- 2.8.100 This Prime Contractor is responsible to inspect all surfaces to receive own work. Promptly notify Construction Manager of any unsuitable substrate conditions. Commencement of installation implies acceptance of all substrate conditions.
- 2.8.101 This Prime Contractor shall coordinate, provide and deliver all required maintenance (attic) stock as required by the Contract Documents. Properly label, package, deliver and store individual materials at direction of the Construction Manager.
- 2.8.102 This Prime Contractor is responsible for protection of own work after installation. Replace damaged areas. Do not reuse broken or damaged units.
- 2.8.103 This Prime Contractor is responsible for coordinating, laying out, providing and installing all hollow-metal doors and frame assemblies complete, including but not limited to fire rated systems, windows, glass/glazing, transoms, exterior HM door heads, mullions, moldings, louvers, vents, hardware, head and jamb stops, glazing stops, back boxes, fasteners, door seals, anchors, reinforcing for hardware and all accessories and sundry items required for a complete and operable system, per contract documents.
- 2.8.104 This Prime Contractor is responsible for coordinating, laying out, providing and installing hollow metal door/window frame combinations where required. Glass in wood and hollow metal doors, and at exterior hollow metal door head/transom to be provided and installed by this Prime Contractor. BP 07 Glazing is not responsible for glass within a hollow metal, hollow metal door heads or wood doors.
- 2.8.105 This Prime Contractor is responsible for coordinating, laying out, providing and installing finish hardware complete, including but not limited to specified finish, magnetic holders, hinges, lock and latch sets, closers, panic hardware, closers, kick plates, trim, lockguards, door stops, seals, thresholds, through bolts, silencers, pad locks, rated hardware, rated doors and frames, etc., and all accessories and sundry items required for a complete operational system, per contract documents. Coordinate with Concrete and other Prime Contractors as required for complete and functional systems.

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- 2.8.106 This Prime Contractor is responsible for Compliance and Certification with Woodwork Institute of California (W.I.C.).
- 2.8.107 This Prime Contractor is responsible for coordinating, laying out, providing and installing all solid-core wood doors, veneer faces, including factory finish, finish carpentry wood doors, and all other miscellaneous and ancillary items as required for a complete and operable installation, per contract documents. Glass in wood and hollow metal doors, and at exterior hollow metal door head/transom to be provided and installed by this Prime Contractor. BP 07 Glazing is not responsible for glass within a hollow metal, hollow metal door heads or wood doors.
- 2.8.108 This Prime Contractor is responsible for coordinating and providing all final adjustments, including shimming, to assure proper operation of doors, windows, hardware, stops, closures, etc., as needed and as required by applicable codes.
- 2.8.109 This Prime Contractor will order and supply permanent cylinders (cores) and keys using secured shipment direct from point of origination to District Locksmith to be installed by the owner. Coordinate keying with General Contractor.
- 2.8.110 This Prime Contractor is responsible for coordinating, laying out, providing and installing temporary construction locks until final keying by owner.
- 2.8.111 This Prime Contractor is responsible for coordinating, receiving, unloading, inventorying, storing, transporting, protecting and installing all materials for own work, including but not limited to hollow metal frames, doors, hardware, etc.
- 2.8.112 This Prime Contractor is responsible for coordinating, laying out, providing and installing thresholds in compliance with ADA requirements, per contract documents. Coordinate threshold installation with Finishes Prime Contractor as required.
- 2.8.113 All welding to be performed by certified welders only. Certified welders must present acceptable credentials to the inspector of record, prior to beginning of work. Provide fire watch continuously during all welding activities.
- 2.8.114 This Prime Contractor is responsible for preparation of finish surfaces to receive own work per contract documents. Coordinate openings with Rough Carpentry and Concrete Prime Contractors.
- 2.8.115 This Prime Contractor is responsible for protection of own work after installation. Replace damaged areas. Do not reuse broken or damaged units.
- 2.8.116 This Prime Contractor is responsible for final adjustment of own work upon completion of installation. Adjustment shall meet all ADA and project requirements.
- 2.8.117 This Prime Contractor is responsible for coordinating, laying out, providing and installing all glass and glazing shown within own work, including but not limited to side lites, door windows, sealants, primers, setting blocks, edge blocks, spacers, shims, clips, pre-formed gaskets, compressible filler rods, mastic, weather stripping, fasteners, adhesives and all miscellaneous accessories and sundry items required for a turn key and complete installation, per contract documents.
- 2.8.118 This Prime Contractor is responsible for removing and reinstalling glass stops, as needed for a complete and finished system.
- 2.8.119 This Prime Contractor is responsible for complying with inspection requirements, including meeting prior notification requirements.

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- 2.8.120 This Prime Contractor is responsible for coordinating, laying out, providing and installing all suspended ceiling systems complete, including but not limited to ceiling grids, framing, acoustical ceiling panels, hanger wires, all attachments to structure, compression posts, struts, hanger wires for light fixtures, trim, wall angles, splices, devices, etc., for a complete installation per contract documents, industry and reference standards. **NOTE: existing grid to be protected in place and reused where indicated at the projects, especially important to note at FAEC. At these locations, new ceiling tile shall be provided and installed in existing grid. Paint and repair existing grid where needed. Unless otherwise noted, the acoustical ceiling grid and tile shall be assumed to be new.**
- 2.8.121 This Prime Contractor is responsible for coordinating, laying out, providing, installing and tying off all acoustical ceilings and wood panel ceilings, including grid, acoustical lay-in ceiling panels, acoustical tiles, luminous ceiling panels, hanger wires, compression struts, hanger wires for light fixtures and air distribution devices, trim, wall angle, moldings, splices, devices, etc. for a complete installation per contract documents and code requirements.
- 2.8.122 This Prime Contractor is responsible for coordinating, laying out, providing and installing all Architectural Vinyl Graphic Films, complete, including all appurtenances, trims, etc. as required for a complete installation.
- 2.8.123 This Prime Contractor is responsible for coordinating, laying out, providing and installing all Wall Coverings and Resilient Tackable Wall covering, complete, including but not limited to all trim/frame, substrate fillers, caulk, primer termination trim as required for a complete and finished installation. This Prime Contractor to coordinate with other Prime Contractors as required for electrical or HVAC controls and provide clean and finished cut outs to accommodate these elements, and any associated trim or caulking where required for a finished appearance.
- 2.8.124 This Prime Contractor is responsible for coordinating, laying out, providing and installing all Sound-Absorbing Wall and Ceiling Units, complete, including but not limited to trim moldings, fixing clips, furring strips, panel adhesive, etc. as required for a complete and finished installation. Coordinate with Electrical and HVAC Prime Contractors to insure no conflicts with light switches, AV, controls, or other building elements.
- 2.8.125 This Prime Contractor is responsible for coordinating, laying out, providing and installing all interior and exterior painting, High Performance Coatings, prep, primer, coatings, for a complete system per contract documents for all finishes including but not limited to drywall, hollow metal frames, backboards, plywood, etc. This Prime Contractor responsible to paint “corner to corner” at all areas to ensure uniformity between areas being improved and areas of the building that are existing and shown to remain.
- 2.8.126 This Prime Contractor is responsible to inspect all surfaces to receive own work. Promptly notify Construction Manager of any unsuitable substrate conditions. Commencement of installation implies acceptance of all substrate conditions. This Prime Contractor is responsible for preparation of finish surfaces to receive own work per contract documents.
- 2.8.127 This Prime Contractor is responsible for priming and paint all sides of the hollow metal frames, for both doors and windows, prior to their installation.
- 2.8.128 This Prime Contractor is responsible for coordinating, laying out, providing and installing primers, sealers, fillers and surface preparations required for own work.

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- 2.8.129 This Prime Contractor is responsible for painting of all walls, ceilings, mechanical, and electrical equipment, duct, conduit, pipe, etc. that will remain exposed, per contract documents. This includes painting the existing ceiling grid shown to protect and remain in place and shown to be re-used with new ceiling tile.
- 2.8.130 This Prime Contractor is responsible for the placement of waste cloths and used painting materials that may constitute a fire hazard in closed metal containers and remove daily from site.
- 2.8.131 This Prime Contractor is responsible to store paint materials in a single suitable place in compliance with OSHA, health and fire regulations. Keep such storage place neat and clean, void of oily or solvent containing rags, waste, etc., taking every precaution to avoid the danger of fire.
- 2.8.132 This Prime Contractor is responsible for removal of all oil residues at areas scheduled to receive paint or finishes.
- 2.8.133 This Prime Contractor is responsible to coordinate, layout, provide and install all paint prior to the installation of any casework, mounted signs, or other finish or specialty items, etc. Full wall surface shall be painted, or finish covered including the areas that will be concealed by another trade's work.
- 2.8.134 This Prime Contractor is responsible to coordinate, layout, provide and install all painting of plaster, and other finishes as required per contract documents.
- 2.8.135 This Prime Contractor is responsible to coordinate, layout, provide and install all touch-up of paint and finishes to new and existing areas as required by normal damages, splatters and marring caused by the process of construction work.
- 2.8.136 This Prime Contractor is responsible to coordinate, layout, provide and install all sealing and finishing of exposed edges of all doors (metal & wood) including the top and bottom.
- 2.8.137 This Prime Contractor is responsible to coordinate, layout, provide and install all caulking/fillers at joints/gaps between Hollow Metal frames and drywall and similar building components as required to produce a complete and finished appearance.
- 2.8.138 This Prime Contractor is responsible to coordinate, layout, provide and install all priming, back priming and sealing of all electrical, communication and telephone equipment backboards. Back prime exposed exterior finish and trim lumber which will require coordination with the Framing Contractor.
- 2.8.139 This Prime Contractor shall provide as many coats of paint as required to cover the painted surfaces to the Architect's satisfaction. The specified number of coats shall be regarded as a minimum.
- 2.8.140 This Prime Contractor acknowledges that finish coats will be scheduled by the Construction Manager and in such a manner so that final coat of painting shall be applied after the completion of all basic work in the building (on an area-by-area basis) and entirely separate from the prime and first coats. Prior to the application of the finish coat in any area, this Prime Contractor shall patch minor damage to finished walls, etc.
- 2.8.141 Prior to painting, all accessories, hardware, switch plates, light fixtures and similar items are to be protected or removed by this Prime Contractor. All such accessories so removed shall also be replaced by this Prime Contractor after painting is completed.
- 2.8.142 This Prime Contractor shall properly prepare all surfaces as necessary, prior to commencement of his work, in accordance with the specification and good standard practice. The following shall be considered the minimum standard of preparation for various surfaces:
- a) All surfaces shall be cleaned "tack ragged" free of loose dirt and dust.

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- b) Metal surfaces shall be solvent washed (turpentine or similar) to remove any dirt and grease.
 - c) Where rust or scale is present, it shall be wire-brushed or sandpapered clean.
 - d) Shop coats of paint or primer that have become marred shall be cleaned and touched up with an approved primer.
 - e) All galvanized metal surfaces shall be cleaned and one coat of galvanized metal primer applied in accordance with manufacturer's directions.
 - f) Door frames shall be cleaned free of paint, concrete, grout, adhesive, plaster or joint compound prior to painting (after other trades perform their obligation).
 - g) Bondo / repair all dings and dents to HM door & window frames. (excessive damage shall be brought to the attention of the Construction Manager prior to beginning the repair work.)
 - h) Drywall and similar surfaces shall receive "painter's prep" (i.e. spackling of minor gouges/nicks/dents/etc., sanding, etc.) as required
- 2.8.143 This Prime Contractor includes all booms/ladders/lifts/equipment/etc. as required to perform own work.
- 2.8.144 This Prime Contractor is aware that the HVAC system may not be operational at the time its work is being performed and this Prime Contractor understands that all ventilation will be natural and that the Construction Manager will not provide fans, heaters or other equipment to condition or ventilate areas. This Prime Contractor shall provide space heaters and/or fans as required to ventilate areas receiving finishes.
- 2.8.145 This Prime Contractor is responsible for performing final cleaning for all areas improved, at both campuses, **twice**, once pre-punch and once post-punch. And shall also include an additional **16 hours of final clean, for each site (total of 32 hours), to be directed by the CM**. Final cleaning shall include all areas improved inside and out, **including hallways and other paths of travel utilized by all Prime Contractors to access and perform their work**. Cleaning to include, but is not limited to interior glass, window frames, sills, cleaning of cabinetry and shelving inside and out, cleaning of restrooms, restroom fixtures, restroom toilet partitions, restroom accessories, mirrors and equipment, closets and storage areas, wiping of doors, jambs and thresholds, wiping of walls, sweeping and mopping floors, vacuuming carpet areas and wiping base, spot cleaning carpet as needed, waxing or polishing floors, power washing all concrete at areas used by Prime Contractors to access and perform their work, including the jobsite office and laydown area.
- 2.8.146 This Prime Contractor is responsible for coordinating with each Prime Contractor, Architect, Consultant and Construction Manager, as required for coordination and proper installation of own work, as it pertains to this bid package, including but not limited with Electrical Prime Contractor, Flooring Prime Contractor, Rough Carpentry Prime Contractor, Specialties Prime Contractor, etc. Coordination may include additional site visits, coordination meetings and providing additional copies of submittals, shop drawings and coordination drawings.
- 2.8.147 This Prime Contractor is responsible for providing and installing work free of any damage. Damaged material will be rejected and must be replaced without delay to the project, at no additional costs.
- 2.8.148 This Prime Contractor is responsible for providing protection of own work, after installation and until occupancy. This Prime Contractor is responsible for removing and disposing of any protection

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utilized.

- 2.8.149 This Prime Contractor is responsible to inspect all surfaces, openings, ceilings, fixtures, etc., where own work will be installed. Promptly notify Construction Manager of any coordination issues or unsuitable conditions. Commencement of installation implies acceptance of all conditions.
- 2.8.150 This Prime Contractor is responsible to provide and manage Construction Personnel toilets complete, including hand wash stations, 30-gallon trash cans, at least one dedicated women's restroom at the office compound and on site, at both sites, and other amenities required per OSHA and shall do so for entire project duration. Service toilets and hand wash stations twice a week. Dump trash cans at least once a week or as required to prevent overflow. **For each project site, assume five (5) men and one (1) women toilets with trays, three (3) hand wash stations with trays, and two (2) trash cans for construction personnel. At both sites, assume on-site CM and IOR will require separate units;** for each site provide one (1) men and one (1) women restroom, plus a hand wash station and tray, and trash can which shall be located near the project trailers and also serviced twice per week for the duration of the project. All women's, site and CM's restrooms shall have key or combination locks provided and appropriate signage indicating gender.
- 2.8.151 The Finishes Prime Contractor shall provide during the project, **for each project**, fifteen (15) 40-yard dumpsters; five (5) 40 yard co-mingle recycle dumpster and six (6) 3-yard trash dumpsters, for use by all Prime Contractors. Finishes Prime Contractor to include the maintenance, dump, return and removal of same at least once per week. Waste tickets shall be tracked and provided to the CONSTRUCTION MANAGER each month. **All unused dumps shall be credited back to the Construction Manager via deductive change order.** The Finishes Prime Contractor is responsible to provide and manage project waste diversion needs for all Prime Contractors, except for the Demolition / Abatement Prime Contractor, and shall do so for both projects, and for the entire project duration. The Demolition Prime Contractor shall provide own dumpsters and removal for demolition and hazardous materials.
- 2.8.152 This Prime Contractor is responsible for coordinating, providing and maintaining, **at each project**, ten (10) 30-gallon trash cans with bags at each building and throughout the site, fastened to metal post in the ground or to fence. Remove trash daily as to keep rodents off of site and out of buildings. Trash cans to be labeled "Food and Drink Debris Only".
- 2.8.153 This Prime Contractor responsible for providing, **at each site**, eight (8) fire extinguishers, on wooden stands for use by all Prime Contractors through the site. Ensure all are tagged and tested for duration of project.
- 2.8.154 This Prime Contractor shall provide and service temporary fire extinguishers throughout the building, as required by the local fire authority during the entire construction duration following concrete pour and demolition. Each extinguisher will be highly visible and affixed to a minimum 1' X 3' red plywood backing board not exceeding 75' apart and at each exit.
- 2.8.155 This Prime Contractor to provide wayfinding signage, CONSTRUCTION PERSONNEL ONLY signage, and other signage required, at each site, to properly and safely direct both construction and student/staff traffic. See site logistics plans. Provide stands for pedestrian signage at sidewalk access points.
- 2.8.156 Provide COVID testing station, pop-up tent, plexi-glass and folding table, for each site where each worker will check-in for temperature checks daily. CM will provide touch-free thermometer and no-symptom confirmation/tracking app. See Attachment K for more information.

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2.8.157 This Prime Contractor is responsible for providing one qualified laborer **75 hours for WHHS** and **75 hours for FAEC** for general site and building cleanup, safety maintenance, temporary weather protection or for discretionary use as directed by the Construction Manager. All hours to be directed and documented by Construction Manager, with all unused hours credited back, via a deductive change order.

 2.8.158 **BID PACKAGE #07 “GLASS & GLAZING, STOREFRONT”** – Prime Contractor is responsible for coordinating and providing all plant, labor, material, equipment, tools, facilities, transportation, applicable taxes, permits, services and coordination necessary for, and incidental to accomplish the work (unless specifically noted otherwise), in accordance with the complete contract documents, and ensure coordination of work between the multiple prime contract bid packages for a complete turnkey and operable system at the school site Foothills Adult Education Center (FAEC) & West Hills HS Science Bldg. (WHHS) Modernization projects, including, but not limited to the following:

2.8.159 FAEC | As-Built Documents | Attachment O

2.8.160 FAEC | Titan ES | Technical Specifications | Attachment G

2.8.161 FAEC | Titan ES | Hazardous Materials Survey Report & Floor Plan | Attachment H

2.8.162 FAEC | Titan ES | Hazardous Materials Abatement Specifications | Attachment I

2.8.163 FAEC | Ruhnau Clarke Architects | Drawings | Attachment E

2.8.164 FAEC | Ruhnau Clarke Architects | Specifications

2.8.165 FAEC | Ruhnau Clarke Architects | 00 00 00 – Procurement & Contracting Requirements - Complete

2.8.166 FAEC | Ruhnau Clarke Architects | 01 00 00 – General Requirements - Complete

2.8.167 FAEC | Ruhnau Clarke Architects | 07 92 00 – Joint Sealants

2.8.168 FAEC | Ruhnau Clarke Architects | 08 06 71 - Door Hardware Schedule

2.8.169 FAEC | Ruhnau Clarke Architects | 08 43 13 - Aluminum-Framed Storefronts

2.8.170 FAEC | Ruhnau Clarke Architects | 08 71 00 - Door Hardware

2.8.171 FAEC | Ruhnau Clarke Architects | 08 80 00 - Glazing

2.8.172 GUHSD | Front End Bid & Contract Documents

2.8.173 This Prime Contractor is responsible for coordinating, laying out, providing and installing all glass and glazing at the FAEC project, including but not limited to fire rated glazing, clear glass, tinted glass, wire glass, heat treated glass, tempered glass, insulated glass, laminated glass, and any other glazing required, glazing film, screens, sealants, primers, setting blocks, edge blocks, spacers, shims, clips, pre-formed gaskets, compressible filler rods, mastic, weather stripping, fasteners, adhesives and all miscellaneous accessories and sundry items required for a complete installation, per contract documents. All openings to be coordinated with Concrete, Door Frames & Hardware and Finishes Prime Contractors. Glass in HM and wood doors to be provided and installed by Finished Prime Contractor.

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- 2.8.174 This Prime Contractor is responsible for coordinating, laying out, providing and installing all glazing systems, aluminum framed entrances, aluminum framed storefronts, venting windows, entrance door systems, entrance door hardware, aluminum doors and frames, curtain walls, aluminum windows, aluminum panels, fixed or operable aluminum window frames and storefronts, including but not limited to fixed aluminum framing, hardware transoms, sidelights, finishes, spaces, shims, weather stripping, fasteners, adhesives, sealants and break metal, specified finishes, for a complete installation, per contract documents.
- 2.8.175 This Prime Contractor is responsible for removing and reinstalling glass stops, as needed for a complete and finished system.
- 2.8.176 This Prime Contractor is responsible for coordinating, laying out, providing and installing all hardware complete, including but not limited to exit devices, panic devices, hinges, handles, pulls, latches, bolts, cylinders, closers, stops, thresholds, sweeps, and all items, accessories and sundry items required for a complete and operable system, per contract documents. Note: Coordinate with Finishes Prime Contractor and District for locksets and keying.
- 2.8.177 This Prime Contractor is responsible for coordinating, laying out, providing and installing all aluminum flashings, head flashings, bituminous flashings jiffy seal and moisture barrier at all aluminum curtain wall and storefronts, including at all horizontal surfaces receiving own work, and where otherwise shown, specified or as required to provide a complete water tight seal.
- 2.8.178 This Prime Contractor is responsible for coordinating, laying out, providing and installing the neoprene in aluminum tube where interior metal or existing framed walls meet glazing and aluminum systems, for a complete installation, per contract documents.
- 2.8.179 This Prime Contractor is responsible for coordinating, laying out, providing and installing aluminum z flashing where required, for a complete installation, per contract documents.
- 2.8.180 This Prime Contractor is responsible for coordinating, laying out, providing and installing all break metal and prefinished break metal for storefront or windows, beams and at any wall ends that terminate in front of any window systems, were occurs, for a complete installation, per contract documents.
- 2.8.181 This Prime Contractor is responsible for caulking all aluminum frames, trim, and aluminum panels to adjacent surfaces for weather tight seal, inside and outside.
- 2.8.182 This Prime Contractor is responsible for performing field water tests, per contract documents and promptly correct any deficiencies.
- 2.8.183 This Prime Contractor is responsible for complying with inspection requirements, including meeting prior notification requirements.
- 2.8.184 This Prime Contractor is responsible for cleaning and removing all labels, signs, tape, etc., after installation.
- 2.8.185 This Prime Contractor is responsible for providing galvanic protection, as required.
- 2.8.186 This Prime Contractor is responsible for coordinating, laying out, providing and installing joint sealants and fire stopping for all work under this bid package. Provide sealant or other approved isolation material at all dissimilar materials.
- 2.8.187 This Prime Contractor is responsible for coordinating, laying out, providing and installing all anchorages, fasteners, adhesives, accessories and sundry items, as required for a complete installation, per contract documents.
- 2.8.188 This Prime Contractor is responsible for providing the means and methods, as required, to protect glass, glazing, aluminum doors and frames in place, throughout the entire duration of the project, until final owner acceptance of the glass and glazing, in writing.

**BID PACKAGE #08 – FINISHES, CEILINGS, DRYWALL, PLASTER, DOOR FRAMES, ACCESS DOORS,
HARDWARE, INSULATION, PAINT & FINAL CLEAN DIVISION OF WORK**

- 2.8.189 This Prime Contractor is responsible to provide documentation of the glazing systems protection procedure, in conjunction with other Prime Contractors performing adjacent work, for review and approval by Construction Manager. Submit protection procedures with Glass and Glazing submittal.
- 2.8.190 This Prime Contractor is responsible for coordinating a glass and glazing turnover meeting with the Construction Manager, Architect, Inspector of Record and Owner, as required to achieve final owner acceptance in writing.
- 2.8.191 This Prime Contractor is responsible for coordinating, laying out, providing and installing weather protection at all glass, glazing, curtain wall, and storefront openings, including but not limited to covering, maintaining and removing upon completion, the watertight system over door and window openings after wall framing operations, and until glass and glazing is completed. Maintain covers on a daily basis until work is complete. This Prime Contractor is responsible for damages to other Prime Contractor's work due to failing to maintain adequate weather protection. Coordinate with other Prime Contractors for a complete watertight system.
- 2.8.192 This Prime Contractor is responsible for fall protection systems per OSHA standards and must adhere to the Balfour Beatty Construction's Zero Harm Safety Program's 6' and over fall protection trigger height. Provide a detailed fall protection plan prior to commencement of work for Construction Manager approval.
- 2.8.193 This Prime Contractor is responsible for coordinating, providing and installing blocking, and all other similar and applicable nailers, etc. per contract documents.
- 2.8.194 This Prime Contractor is responsible for coordinating, providing and installing gauge break metal required at jambs of storefront or curtain wall systems and all other similar and applicable installations, per contract documents. Finish to match storefront or window system finishes.
- 2.8.195 This Prime Contractor is responsible for coordinating, providing and installing gauged metal flashing, and all other similar and applicable details and installations for flashings around the heads/jambs/sills of window systems/ curtain wall systems, per contract documents. Finish of flashings to match window system finishes.
- 2.8.196 This Prime Contractor is responsible for providing one qualified laborer **0 hours for WHHS and 10 hours for FAEC** for general site and building cleanup, safety maintenance, temporary weather protection or for discretionary use as directed by the Construction Manager. All hours to be directed and documented by Construction Manager, with all unused hours credited back, via a deductive change order. This is in addition to clean up responsibilities for own crew and own work. Work space is expected to be kept in broom-swept condition at all times.

END OF BID PACKAGE

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		BP #01 DEMOLITION & ABATEMENT	BP #02 LANDSCAPE & IRRIGATION	BP #03 PLUMBING & UTILITIES	BP #04 CONCRETE, SITE FURNISHINGS, SITE WORK, STRIPING	BP #05 ROUGH CARPENTRY	BP #06 FINISH CARPENTRY & COUNTERTOPS	BP #07 GLAZING, STOREFRONT	BP #08 FINISHES, CEILINGS, PLASTER, DOORS FRAMES & HARDWARE	BP #09 FLOORING, TILING	BP #10 SPECIALTIES	BP #11 HVAC & CONTROLS	BP #12 ELECTRICAL & LOW VOLTAGE	BP #13 FIRE SPRINKLER
Division 00	Procurement and Contracting Requirements													
00 01 01	Project Title Page	P	P	P	P	P	P	P	P	P	P	P	P	P
00 01 02	Project Informaton	P	P	P	P	P	P	P	P	P	P	P	P	P
00 01 07	Seals Page - Signed	P	P	P	P	P	P	P	P	P	P	P	P	P
00 01 10	Table of Contents	P	P	P	P	P	P	P	P	P	P	P	P	P
00 40 25	Request for Information	P	P	P	P	P	P	P	P	P	P	P	P	P
00 43 25	Substitution Request Form - During Procurement	P	P	P	P	P	P	P	P	P	P	P	P	P
00 63 25	Substitution Request Form - During Constructon	P	P	P	P	P	P	P	P	P	P	P	P	P
Division 01	General Requirements													
01 10 00	Summary	P	P	P	P	P	P	P	P	P	P	P	P	P
01 20 00	Price and Payment Procedures	P	P	P	P	P	P	P	P	P	P	P	P	P
01 25 00	Substitution Procedures	P	P	P	P	P	P	P	P	P	P	P	P	P
01 30 00	Administrative Requirements	P	P	P	P	P	P	P	P	P	P	P	P	P
01 30 00.01	Request for Interpretation	P	P	P	P	P	P	P	P	P	P	P	P	P
01 30 00.02	Submittal Transmittal	P	P	P	P	P	P	P	P	P	P	P	P	P
01 31 14	Facility Services Coordination	P	P	P	P	P	P	P	P	P	P	P	P	P
01 40 00	Quality Requirements	P	P	P	P	P	P	P	P	P	P	P	P	P
01 41 00	Regulatory Requirements	P	P	P	P	P	P	P	P	P	P	P	P	P
01 42 19	Reference Standards	P	P	P	P	P	P	P	P	P	P	P	P	P
01 45 33	Code-Required Special Inspections	P	P	P	P	P	P	P	P	P	P	P	P	P
01 50 00	Temporary Facilities and Controls	P	P	P	P	P	P	P	P	P	P	P	P	P
01 57 19	Temporary Environmental Controls	P	P	P	P	P	P	P	P	P	P	P	P	P
01 58 13	Temporary Project Signage	P	P	P	P	P	P	P	P	P	P	P	P	P
01 60 00	Product Requirements	P	P	P	P	P	P	P	P	P	P	P	P	P
01 61 16	Volatile Organic Compound (VOC) Content Restrictons	P	P	P	P	P	P	P	P	P	P	P	P	P
01 61 16.01	Accessory Material VOC Content Certification Form	P	P	P	P	P	P	P	P	P	P	P	P	P
01 70 00	Execution and Closeout Requirements	P	P	P	P	P	P	P	P	P	P	P	P	P
01 73 56	Alteration and Modernization Execution Procedures	P	P	P	P	P	P	P	P	P	P	P	P	P
01 74 19	Constructon Waste Management and Disposal	P	P	P	P	P	P	P	P	P	P	P	P	P

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01 74 19.01	Form Attachments	P	P	P	P	P	P	P	P	P	P	P	P	
01 76 10	Temporary Protective Coverings	P	P	P	P	P	P	P	P	P	P	P	P	
01 78 00	Closeout Submittals	P	P	P	P	P	P	P	P	P	P	P	P	
01 79 00	Demonstration and Training	P	P	P	P	P	P	P	P	P	P	P	P	
Division 02 Existing Conditions														
02 41 00	Demolition	P		P								S		
02 84 00	Polychlorinate Biphenyl (PCB) Remediaton	P												
Division 03 Concrete														
03 01 00	Maintenance of Concrete				P				P					
03 30 00	Cast-in-Place Concrete				P									
03 35 11	Concrete Floor Finishes				P									
Division 05 Metals														
05 05 19	Post-Installed Concrete Anchors				P				P		S			
05 40 00	Cold-Formed Metal Framing								P					
05 50 00	Metal Fabrications				P				P					
Division 06 Wood and Plastics and Composites														
06 10 63	Miscellaneous Rough Carpentry					P								
06 20 00	Finish Carpentry					P								
06 41 00	Architectural Wood Casework					P								
06 83 16	Fiberglass Reinforced Paneling								P					
Division 07 Thermal and Moisture Protection														
07 21 00	Thermal Insulation								P					
07 25 00	Weather Barriers								P					
07 62 00	Sheet Metal Flashing and Trim								P					
07 92 00	Joint Sealants			P	P		P	P	P	P	P	P	P	
Division 08 Openings														
08 06 71	Door Hardware Schedule								P	P				
08 11 13	Hollow Metal Doors and Frames								P					
08 31 00	Access Doors and Panels			P					P		P	P	P	

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08 43 13	Aluminum-Framed Storefronts							P	P					
08 71 00	Door Hardware							P	P					
08 80 00	Glazing							P	P					
Division 09 Finishes														
09 05 61	Common Work Results for Flooring Preparation									P				
09 21 16	Gypsum Board Assemblies									P				
09 22 36	Lath									P				
09 24 00	Cement Plastering									P				
09 30 00	Tiling									P				
09 51 00	Acoustical Ceilings									P				
09 65 00	Resilient Flooring									P				
09 68 13	Tile Carpeting									P				
09 72 00	Wall Coverings									P				
09 72 16.26	Architectural Vinyl Graphic Films									P				
09 72 60	Resilient Tackable Wall Covering									P				
09 84 30	Sound-Absorbing Wall and Ceiling Units									P				
09 91 13	Exterior Painting									P				
09 91 23	Interior Painting									P				
Division 10 Specialties														
10 11 00	Visual Display Units										P			
10 14 00	Signage										P			
10 14 53	Traffic, Parking and Site Signage				P						S			
10 21 13.19	Plastic Toilet Compartments										P			
10 26 00	Wall and Door Protection									P				
10 28 00	Toilet Accessories										P			
10 44 00	Fire Protection Specialties										P			
10 51 13	Metal Lockers										P			
Division 12 Furnishings														
12 15 00	Display System										P			

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12 36 00	Countertops						P							
Division 13 Special Construction														
13 31 33.10	Single Post Fabric Shade Structure				P									
Division 21 Fire Suppression														
21 13 13	Wet-Pipe Sprinkler Systems													P
Division 22 Plumbing														
22 05 17	Sleeves and Sleeve Seals for Plumbing Piping			P										
22 05 18	Escutcheons for Plumbing Piping			P										
22 05 19	Meters and Gauges for Plumbing Piping			P										
22 05 23	General-Duty Valves for Plumbing Piping			P										
22 05 29	Hangers and Supports for Plumbing Piping and Equipment			P										
22 05 48	Vibraton and Seismic Controls for Plumbing Piping and Equipment			P										
22 05 53	Identification for Plumbing Piping and Equipment			P										
22 07 19	Plumbing Piping Insulation			P										
22 11 16	Domestic Water Piping			P										
22 11 19	Domestic Water Piping Specialties			P										
22 13 16	Sanitary Waste and Vent Piping			P										
22 13 19	Sanitary Waste Piping Specialties			P										
22 41 00	Residential Plumbing Fixtures			P										
22 42 13.13	Commercial Water Closets			P										
22 42 13.16	Commercial Urinals			P										
22 42 16.13	Commercial Lavatories			P										
22 47 13	Drinking Fountains			P										
Division 23 Heating, Ventilating, and Air Conditioning														
23 00 10	Mechanical General Requirements											P		
23 00 50	Basic Mechanical Materials and Methods											P		
23 01 30.51	HVAC Air-Distribution System											P		
23 05 29	Hangers and Supports for HVAC											P		

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23 05 93	Testing, Adjusting, and Balancing for HVAC											P		
23 07 13	Duct Insulation											P		
23 07 19	HVAC Piping Insulation											P		
23 09 00	Instrumentation and Control for HVAC											P		
23 09 80	Mechanical Commissioning											P		
23 09 93	Sequence of Operations for HVAC Controls											P		
23 23 00	Refrigerant Piping											P		
23 31 13	Metal Ducts											P		
23 33 00	Air Duct Accessories											P		
23 37 13	Diffusers, Registers, and Grilles											P		
23 81 26	Split-System Air-Conditioners											P		
Division 26 Electrical														
26 01 00	General Provisions												P	
26 05 19	Power Conductors												P	
26 05 26	Grounding												P	
26 05 33	Conduit and Fittings												P	
26 05 34	Outlet and Junction Boxes												P	
26 08 00	Commissioning												P	
26 09 23	Digital Lighting Control System												P	
26 24 16	Panelboards												P	
26 27 26	Switches and Receptacles												P	
26 28 16	Disconnects												P	
26 51 14	LED Lighting Fixtures and Lamps												P	
26 90 90	Testing												P	
Division 27 Communications														
27 01 00	General Provisions												P	
27 10 00	Voice Data Infrastructure												P	
27 20 00	Integrated Audio Visual Systems												P	
27 41 19	Portable Assistive Listening System												P	

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		BP #02 LANDSCAPE & IRRIGATION																		
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		BP #07 GLAZING, STOREFRONT																		
		BP #08 FINISHES, CEILINGS, PLASTER, DOORS FRAMES & HARDWARE																		
		BP #09 FLOORING, TILING																		
		BP #10 SPECIALTIES																		
		BP #11 HVAC & CONTROLS																		
		BP #12 ELECTRICAL & LOW VOLTAGE																		
		BP #13 FIRE SPRINKLER																		
Division 28 Electronic Safety and Security																				
28 01 00	General Provisions																		P	
28 30 00	Fire Alarm System																		P	
Division 31 Earthwork																				
31 23 16.13	Trenching		P	P	P														P	
Division 32 Exterior Improvements																				
32 12 16	Asphalt Paving				P															
32 13 13	Concrete Paving				P															
32 17 13	Parking Bumpers				P															
32 17 23.13	Painted Pavement Markings				P															
32 17 26	Tactile Warning Surfacing				P															
32 31 19	Decorative Metal Fence and Gates				P															
32 84 23	Irrigation System		P																	
32 93 00	Planting		P																	
Temporary & General Services																				
	Temporary Site Fencing & Gates				P															
	Temporary Site & CM / IOR Office Power & Internet																		P	
	Temporary Site Water			P																
	Site SWPPP BMPs (Supply & Maintain)				P															
	Temporary Restroom & Handwash Facilities												P							
	Dumpsters & Site Trash	P											P							
	Construction Fire Extinguishers												P							
	Site Construction Signage												P							
	Final Cleaning												P							
	COVID Temperature & Check-in Station												P							

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Division 00 Procurement and Contracting Requirements

00 01 01	Project Title Page	P	P	P	P	P	P	P	P	P	P	P	P
00 01 02	Project Information	P	P	P	P	P	P	P	P	P	P	P	P
00 01 07	Seals Page - Signed	P	P	P	P	P	P	P	P	P	P	P	P
00 01 08	Deferred Approvals	P	P	P	P	P	P	P	P	P	P	P	P
00 01 10	Table of Contents	P	P	P	P	P	P	P	P	P	P	P	P
00 40 25	Request for Information	P	P	P	P	P	P	P	P	P	P	P	P
00 43 25	Substitution Request Form - During Procurement	P	P	P	P	P	P	P	P	P	P	P	P
00 63 25	Substitution Request Form - During Constructon	P	P	P	P	P	P	P	P	P	P	P	P

Division 01 General Requirements

01 10 00	Summary	P	P	P	P	P	P	P	P	P	P	P	P
01 20 00	Price and Payment Procedures	P	P	P	P	P	P	P	P	P	P	P	P
01 25 00	Substitution Procedures	P	P	P	P	P	P	P	P	P	P	P	P
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01 30 00.02	Submittal Transmittal Form	P	P	P	P	P	P	P	P	P	P	P	P
01 35 50	Requests for Electronic Files	P	P	P	P	P	P	P	P	P	P	P	P
01 35 53	Security Procedures	P	P	P	P	P	P	P	P	P	P	P	P
01 40 00	Quality Requirements	P	P	P	P	P	P	P	P	P	P	P	P
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01 57 19	Temporary Environmental Controls	P	P	P	P	P	P	P	P	P	P	P	P
01 58 13	Temporary Project Signage	P	P	P	P	P	P	P	P	P	P	P	P
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01 61 16.01	Accessory Material VOC Content Certification Form	P	P	P	P	P	P	P	P	P	P	P	P

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		DEMOLITION & ABATEMENT	LANDSCAPE & IRRIGATION	PLUMBING & UTILITIES	CONCRETE, SITE FURNISHINGS, SITE WORK, STRIPING	ROUGH CARPENTRY	FINISH CARPENTRY & COUNTERTOPS	GLAZING, STOREFRONT	FINISHES, CEILINGS, PLASTER, DOORS FRAMES & HARDWARE	FLOORING, TILING	SPECIALTIES	HVAC & CONTROLS	ELECTRICAL & LOW VOLTAGE	FIRE SPRINKLER
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01 76 10	Temporary Protective Coverings	P	P	P	P	P	P	P	P	P	P	P	P	
01 78 00	Closeout Submittals	P	P	P	P	P	P	P	P	P	P	P	P	
01 78 00.01	Warranty Form Letter	P	P	P	P	P	P	P	P	P	P	P	P	
01 79 00	Demonstration and Training	P	P	P	P	P	P	P	P	P	P	P	P	
Division 02 Existing Conditions														
02 41 00	Demolition	P				P				P				
Division 03 Concrete														
03 10 00	Concrete Forming and Accessories				P									
03 20 00	Concrete Reinforcing				P									
03 30 00	Cast-in-Place Concrete				P									
Division 05 Metals														
05 05 19	Post-Installed Concrete Anchors				P	P	P		P		P			
05 50 00	Metal Fabrications								P					
05 52 13	Pipe and Tube Railings			P										
Division 06 Wood and Plastics and Composites														
06 05 73	Wood Treatment					P	P							
06 10 00	Rough Carpentry					P								
06 20 00	Finish Carpentry						P							
06 41 00	Architectural Wood Casework						P							
06 83 16	Fiberglass Reinforced Paneling								P					
Division 07 Thermal and Moisture Protection														
07 01 50.20	Roofing Restoration Patch and Repair					P			P					
07 21 00	Thermal Insulation								P					
07 25 00	Weather Barriers								P					

1

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		DEMOLITION & ABATEMENT	LANDSCAPE & IRRIGATION	PLUMBING & UTILITIES	CONCRETE, SITE FURNISHINGS, SITE WORK, STRIPING	ROUGH CARPENTRY	FINISH CARPENTRY & COUNTERTOPS	GLAZING, STOREFRONT	FINISHES, CEILINGS, PLASTER, DOORS FRAMES & HARDWARE	FLOORING, TILING	SPECIALTIES	HVAC & CONTROLS	ELECTRICAL & LOW VOLTAGE	FIRE SPRINKLER
07 62 00	Sheet Metal Flashing and Trim							P						
07 92 00	Joint Sealants			P	P	P	P		P	P	P	P	P	
Division 08 Openings														
08 06 71	Door Hardware Schedule							P						
08 11 13	Hollow Metal Doors and Frames							P						
08 14 16	Flush Wood Doors							P						
08 31 00	Access Doors and Panels			P		P		P				P		
08 71 00	Door Hardware							P						
08 80 00	Glazing							P						
Division 09 Finishes														
09 05 61	Common Work Results for Flooring Preparation								P					
09 21 16	Gypsum Board Assemblies							P						
09 22 36	Lath							P						
09 24 00	Cement Plastering							P						
09 51 00	Acoustical Ceilings							P						
09 65 00	Resilient Flooring								P					
09 68 13	Tile Carpeting								P					
09 91 13	Exterior Painting							P						
09 91 23	Interior Painting							P						
09 96 00	High-Performance Coatings							P						
Division 10 Specialties														
10 11 00	Visual Display Units									P				
10 14 00	Signage									P				
10 22 39	Folding Panel Partitions									P				
10 26 00	Wall and Door Protection							P						
10 44 00	Fire Protection Specialties									P				
Division 11 Equipment														
11 52 13	Projecton Screens											P		

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		DEMOLITION & ABATEMENT	LANDSCAPE & IRRIGATION	PLUMBING & UTILITIES	CONCRETE, SITE FURNISHINGS, SITE WORK, STRIPING	ROUGH CARPENTRY	FINISH CARPENTRY & COUNTERTOPS	GLAZING, STOREFRONT	FINISHES, CEILINGS, PLASTER, DOORS FRAMES & HARDWARE	FLOORING, TILING	SPECIALTIES	HVAC & CONTROLS	ELECTRICAL & LOW VOLTAGE	FIRE SPRINKLER
11 53 00	Laboratory Equipment									P		S		
Division 12 Furnishings														
12 35 53.19	Wood Laboratory Casework [OFCl]					P								
12 61 10	Fixed Lecture Seating									P				
Division 22 Plumbing														
22 05 17	Sleeves and Sleeve Seals for Plumbing Piping			P										
22 05 18	Escutcheons for Plumbing Piping			P										
22 05 19	Meters and Gauges for Plumbing Piping			P										
22 05 23	General-Duty Valves for Plumbing Piping			P										
22 05 29	Hangers and Supports for Plumbing Piping and Equipment			P										
22 05 48	Vibraton and Seismic Controls for Plumbing Piping and Equipment			P										
22 05 53	Identfcaton for Plumbing Piping and Equipment			P										
22 07 19	Plumbing Piping Insulation			P										
22 11 16	Domestic Water Piping			P										
22 11 19	Domestic Water Piping Specialties			P										
22 13 16	Sanitary Waste and Vent Piping			P										
22 13 19	Sanitary Waste and Vent Piping Specialties			P										
22 42 16.16	Commercial Sinks			P										
22 45 00	Emergency Plumbing Fixtures			P										
22 66 00	Chemical-Waste Systems for Laboratory Facilities			P										
Division 23 Heating, Ventilating, and Air Conditioning														
23 31 13	Duct Cleaning										P			
23 37 13	Diffusers, Registers, and Grilles										P			
Division 26 Electrical														
26 01 00	Electrical General Provisions											P		
26 05 19	Power Conductors											P		
26 05 26	Grounding											P		

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		DEMOLITION & ABATEMENT	LANDSCAPE & IRRIGATION	PLUMBING & UTILITIES	CONCRETE, SITE FURNISHINGS, SITE WORK, STRIPING	ROUGH CARPENTRY	FINISH CARPENTRY & COUNTERTOPS	GLAZING, STOREFRONT	FINISHES, CEILINGS, PLASTER, DOORS FRAMES & HARDWARE	FLOORING, TILING	SPECIALTIES	HVAC & CONTROLS	ELECTRICAL & LOW VOLTAGE	FIRE SPRINKLER
26 05 33	Conduit and Fittings												P	
26 05 34	Outlet and Junction Boxes												P	
26 08 00	Commissioning of Electrical Systems												P	
26 09 23	Digital Lighting Control System												P	
26 24 16	Panelboards												P	
26 27 26	Switches and Receptacles												P	
26 28 16	Disconnects												P	
26 51 14	LED Lighting Fixtures and Lamps												P	
26 90 90	Electrical Closeout												P	
Division 27 Communications														
27 01 00	Communications General Provisions												P	
27 10 00	Voice / Data / IP Intercom-Clock Infrastructure												P	
27 20 00	Integrated Audio/Visual System												P	
Division 32 Exterior Improvements														
32 13 13	Concrete Paving				P									
32 31 13	Chain Link Fence and Gates				P									
Temporary & General Services														
	Temporary Site Fencing & Gates				P									
	Temporary Site & CM / IOR Office Power & Internet												P	
	Temporary Site Water			P										
	Site SWPPP BMPs (Supply & Maintain)				P									
	Temporary Restroom & Handwash Facilities							P						
	Dumpsters & Site Trash	P						P						
	Construction Fire Extinguishers							P						
	Site Construction Signage							P						
	Final Cleaning							P						
	COVID Temperature & Check-in Station							P						

DSA Approved WHHS Plans

SCIENCE BLDG. MODERNIZATION

8756 MAST BOULEVARD, SANTEE, CA 92071
GROSSMONT UNION HIGH SCHOOL DISTRICT

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REVIEWED FOR
SS FLS ACS
DATE: 03/11/2021

AGENCY APPROVAL
PR No. 04

RUHNAU
CLARKE
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TYPICAL ABBREVIATIONS	GENERAL NOTES	REGIONAL MAP	SHEET INDEX	SCOPE OF WORK																																																	
<p>GA GAUGE GALVANIZED GLASS GLUE LAMINATED O ROUND</p> <p>ACPL ACOUSTIC PLASTER ACT ACOUSTIC TILE ABOVE FINISHED FLOOR</p> <p>BLKG BLOCKING BOARD BOS BOTTOM OF STRUCTURE BB BULLETIN BOARD</p> <p>CAB CABINET CPT CARPET CSWK CASEWORK CLG CEILING CEM CEMENT CPL CEMENT PLASTER CL CENTERLINE CT CERAMIC TILE CLF CHAIN LINK FENCE CLR CLEAR COL COLUMN CONC CONCRETE CMU CONCRETE MASONRY UNIT CJ COLD JOINT CONT CONTIGUOUS CF CUBIC FEET</p> <p>DP DEMOUNTABLE PARTITION DET DETAIL DIMENSION DR DOOR DRF DOOR FRAME DL DOOR LOWER DN DOWN DS DOWN SPOUT DF DRINKING FOUNTAIN DSA DIVISION OF STATE ARCHITECT DWGS DRAWINGS</p> <p>EA EACH ELEC ELECTRIC EWC ELECTRIC WATER COOLER ELEV ELEVATION ENCL ENCLOSURE EQ EQUAL EQUIP EQUIPMENT EX EXISTING EXP EXPANSION EXPOSED EJ EXPANSION JOINT EW EACH WAY EXT EXTERIOR</p> <p>FS FLOOR SINK FOF FACE OF FINISH FOM FACE OF MASONRY FOS FACE OF STUD FIN FINISH FFC FINISH CEILING FFG FINISH GRADE FFE FINISH FLOOR GRADE FEC FIRE EXTINGUISHER CABINET FHC FIRE HOSE CABINET FRFP FIREPROOF/FIREPROOFING FD FLOOR DRAIN FLR FLOOR FURN FURNISH/FURNITURE</p> <p>GA GAUGE GALVANIZED GLASS GLUE LAMINATED O ROUND</p> <p>ACPL ACOUSTIC PLASTER ACT ACOUSTIC TILE ABOVE FINISHED FLOOR</p> <p>BLKG BLOCKING BOARD BOS BOTTOM OF STRUCTURE BB BULLETIN BOARD</p> <p>CAB CABINET CPT CARPET CSWK CASEWORK CLG CEILING CEM CEMENT CPL CEMENT PLASTER CL CENTERLINE CT CERAMIC TILE CLF CHAIN LINK FENCE CLR CLEAR COL COLUMN CONC CONCRETE CMU CONCRETE MASONRY UNIT CJ COLD JOINT CONT CONTIGUOUS CF CUBIC FEET</p> <p>DP DEMOUNTABLE PARTITION DET DETAIL DIMENSION DR DOOR DRF DOOR FRAME DL DOOR LOWER DN DOWN DS DOWN SPOUT DF DRINKING FOUNTAIN DSA DIVISION OF STATE ARCHITECT DWGS DRAWINGS</p> <p>EA EACH ELEC ELECTRIC EWC ELECTRIC WATER COOLER ELEV ELEVATION ENCL ENCLOSURE EQ EQUAL EQUIP EQUIPMENT EX EXISTING EXP EXPANSION EXPOSED EJ EXPANSION JOINT EW EACH WAY EXT EXTERIOR</p> <p>FS FLOOR SINK FOF FACE OF FINISH FOM FACE OF MASONRY FOS FACE OF STUD FIN FINISH FFC FINISH CEILING FFG FINISH GRADE FFE FINISH FLOOR GRADE FEC FIRE EXTINGUISHER CABINET FHC FIRE HOSE CABINET FRFP FIREPROOF/FIREPROOFING FD FLOOR DRAIN FLR FLOOR FURN FURNISH/FURNITURE</p>	<p>RSB RESILIENT BASE RT RUBBER TREAD RWL RAIN WATER LEADER</p> <p>SRF SEAMLESS RESILIENT SHEET SS SERVICE SINK/STAINLESS STEEL SHTH SHEATHING SC SOLID CORE SB SPLASH BLOCK STN STAIN STD STANDARD STR STRUCTURAL/STRUCTURE</p> <p>E SUSP SUSPENDED SM SHEET METAL SIM SIMLAR</p> <p>TB TACK BOARD TJ TOOLED JOINT TC TOP OF CONCRETE CURB TS TUBE STEEL TW TOP OF WALK TYP TYPICAL TEL TELEPHONE TEMP TEMPERATURE TOC TOP OF CANOPY TOR TOP OF ROOF TOS TOP OF STRUCTURE TOW TOP OF PARAPET TOW TOP OF WALL</p> <p>UC UNDER CURT UNO UNDER COUNTER UNLESS NOTED OTHERWISE</p> <p>VERT VERTICAL VCT VINYL COATED VCT VINYL COMPOSITION VT VINYL TILE VSE VINYL SHEET FLOORING VWF VINYL WALL COVERING VVC VERIFIED IN FIELD VTR VENT THROUGH ROOF</p> <p>WVF WELD WIRE FABRIC W1 WOODWORKING</p> <p>INSTITUTE</p> <p>WIN WINDOW WJ WITH WJ WOOD W/O WITHOUT</p>	<p>Project Name: West Hills High School Project Address: 8756 Mast Blvd., Santee, CA 92071</p>	<p>SHEET INDEX T-1 TITLE SHEET & SHEET INDEX</p> <p>GENERAL SHEET G-1 OVERALL SITE PLAN FIRE ACCESS PLAN G-2 EGRESS & SIGNAGE PLANS</p> <p>ARCHITECTURAL SITE PLANS AS-1.1 OVERALL SITE PLAN AS-1.2 ENLARGED SITE PLANS AS-1.3 ENLARGED SITE PLANS ASD-1.1 SITE DETAILS</p> <p>ARCHITECTURE A-1.0 FLOOR PLAN - DEMO. A-1.1 FLOOR PLAN - MOD. A-2.1 REFLECTED CEILING PLAN - DEMO. A-2.2 REFLECTED CEILING PLAN - MOD. A-4.1 EXTERIOR ELEVATIONS A-4.2 EXTERIOR ELEVATIONS A-7.1 ENLARGED PLANS & INTERIOR ELEVATIONS A-7.2 INTERIOR ELEVATIONS A-7.3 INTERIOR ELEVATIONS A-7.4 INTERIOR ELEVATIONS A-7.5 INTERIOR ELEVATIONS A-8.1 DOOR & WINDOW SCHEDULE AD-1.1 ACCESSIBILITY & SIGNAGE DETAILS AD-1.2 CASEWORK DETAILS AD-2.1 WALL TYPES & DETAILS AD-4.1 CEILING DETAILS AD-6.1 DOOR DETAILS</p> <p>INTERIOR DESIGN ID-1.0 FINISH SCHEDULE & CMP LEGEND</p> <p>STRUCTURAL S0-1.1 GENERAL NOTES S0-1.2 GENERAL NOTES S0-2.1 TYPICAL DETAILS S1-1.1 FOUNDATION PLAN</p> <p>MECHANICAL M1-1.1 MECHANICAL FLOOR PLAN M1-1.2 MECHANICAL REFERENCE PLAN</p> <p>PLUMBING P1-0.1 LEGEND & NOTES P1-0.2 PLUMBING SCHEDULES P1-1.1 PLUMBING FLOOR PLAN - DEMO P1-1.2 PLUMBING FLOOR PLAN - MOD. P1-3.0 PLUMBING ENLARGED PLANS P1-3.1 PLUMBING ENLARGED PLANS</p>	<p>INTERIOR REMODEL OF AN EXISTING SCIENCE BUILDING INCLUDING ACCESSIBILITY UPGRADES AND FINISH UPDATES, REPLACEMENT OF EXISTING DOORS, AND REMOVAL OF EXISTING ATTACHED GREENHOUSE.</p>																																																	
<p>ARCHITECTURAL SYMBOLS</p> <p>BUILDING SECTION DIRECTION OF VIEW CUT VIEW ON SHEET SHEET ON WHICH DETAIL OCCURS</p> <p>EXTERIOR ELEVATION DIRECTION OF VIEW VIEW ON SHEET SHEET ON WHICH DETAIL OCCURS</p> <p>DETAIL REFERENCE TO DRAWINGS VIEW ON SHEET SHEET ON WHICH DETAIL OCCURS DIRECTION OF VIEW</p> <p>ROOM TAG ROOM NAME ROOM NUMBER</p> <p>DOOR TAG DOOR TAG DOOR RATING</p> <p>WINDOW TAG WINDOW TAG</p> <p>KEYNOTE CONSTRUCTION KEY NOTE NUMBER ASSOCIATED DETAIL REFERENCE</p> <p>CASEWORK IDENTIFICATION: DEPTH HEIGHT INDICATES SPECIAL CONDITION W.I.C. NUMBER LENGTH LOCK EXPLANATION OF SPECIAL CONDITION IF NEEDED</p>	<p>APPLICABLE AGENCIES</p> <p>STATE OF CALIFORNIA DEPARTMENT OF GENERAL SERVICES DIVISION OF THE STATE ARCHITECT 10920 VIA FRONTERA ROAD, STE. 300 SAN DIEGO, CA 92127 TEL: (619) 574-5400</p>	<p>APPLICABLE CODES</p> <p>PARTIAL LIST OF APPLICABLE CODES AS OF JANUARY 1, 2020 2019 CALIFORNIA ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R. 2019 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R. (2018 INTERNATIONAL BUILDING CODE VOLUMES 1-7 & 2019 CALIFORNIA AMENDMENTS) 2019 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R. (2017 NATIONAL ELECTRICAL CODE AND 2019 CALIFORNIA AMENDMENTS) 2019 CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24 C.C.R. (2018 INTERNATIONAL MECHANICAL CODE AND 2019 CALIFORNIA AMENDMENTS) 2019 CALIFORNIA MECHANICAL CODE (CMC) PART 5, TITLE 24 C.C.R. (2018 INTERNATIONAL MECHANICAL CODE AND 2019 CALIFORNIA AMENDMENTS) 2019 CALIFORNIA ENERGY CODE, PART 6, TITLE 24 C.C.R. 2019 CALIFORNIA FIRE CODE, PART 9, TITLE 24 C.C.R. (2018 INTERNATIONAL FIRE CODE AND 2019 CALIFORNIA AMENDMENTS) 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24 C.C.R. 2019 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24 C.C.R. TITLE 19 C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS. 2016 ASME A17.1 SAFETY CODE FOR ELEVATORS AND ESCALATORS</p> <p>PARTIAL LIST OF APPLICABLE STANDARDS</p> <table border="1"> <tr><td>NFPA 13</td><td>AUTOMATIC FIRE SPRINKLER SYSTEMS</td><td>2016 EDITION</td></tr> <tr><td>NFPA 14</td><td>STANDPIPE AND HOSE SYSTEMS</td><td>2016 EDITION</td></tr> <tr><td>NFPA 17</td><td>DRY CHEMICAL EXTINGUISHING SYSTEMS</td><td>2017 EDITION</td></tr> <tr><td>NFPA 17A</td><td>WET CHEMICAL EXTINGUISHING SYSTEMS</td><td>2017 EDITION</td></tr> <tr><td>NFPA 20</td><td>STATIONARY PUMPS FOR FIRE PROTECTION</td><td>2016 EDITION</td></tr> <tr><td>NFPA 22</td><td>WATER TANKS FOR PRIVATE FIRE PROTECTION</td><td>2013 EDITION</td></tr> <tr><td>NFPA 24</td><td>PRIVATE FIRE MAINS & THEIR APPURTENANCES</td><td>2016 EDITION</td></tr> <tr><td>NFPA 25</td><td>STANDARD FOR INSPECTION, TESTING AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS</td><td>2013 EDITION</td></tr> <tr><td>NFPA 72</td><td>NATIONAL FIRE ALARM CODE & SIGNALING CODE</td><td>2016 EDITION</td></tr> <tr><td>NFPA 80</td><td>FIRE DOORS AND OTHER OPENING PROTECTIVES</td><td>2016 EDITION</td></tr> <tr><td>NFPA 82</td><td>STANDARD FOR SMOKE CONTROL SYSTEMS</td><td>2015 EDITION</td></tr> <tr><td>NFPA 253</td><td>CRITICAL RADIANT FLUX OF FLOOR COVERING SYSTEMS</td><td>2015 EDITION</td></tr> <tr><td>NFPA 2001</td><td>CLEAN AGENT FIRE EXTINGUISHING SYSTEMS</td><td>2015 EDITION</td></tr> <tr><td>IFC 300</td><td>ICC STANDARDS ON BLEACHERS, FOLDING AND TELESCOPING SEATING AND GRAND STANDS</td><td>2017 EDITION</td></tr> <tr><td>UL 300</td><td>FIRE TESTING OF FIRE EXTINGUISHING SYSTEMS FOR PROTECTION OF RESTAURANT COOKING AREAS</td><td>2005 EDITION</td></tr> <tr><td>UL 464</td><td>AUDIBLE SIGNAL APPLIANCES</td><td>2003 EDITION</td></tr> <tr><td>UL 521</td><td>HEAT DETECTORS FOR FIRE PROTECTIVE SIGNALING SYSTEMS</td><td>1999 EDITION</td></tr> </table> <p>REFERENCE CODE SECTION FOR NFPA STANDARDS - 2019 CBC (IFM) CHAPTER 35. SEE CHAPTER 35 FOR STATE OF CALIFORNIA AMENDMENTS TO NFPA STANDARDS.</p>	NFPA 13	AUTOMATIC FIRE SPRINKLER SYSTEMS	2016 EDITION	NFPA 14	STANDPIPE AND HOSE SYSTEMS	2016 EDITION	NFPA 17	DRY CHEMICAL EXTINGUISHING SYSTEMS	2017 EDITION	NFPA 17A	WET CHEMICAL EXTINGUISHING SYSTEMS	2017 EDITION	NFPA 20	STATIONARY PUMPS FOR FIRE PROTECTION	2016 EDITION	NFPA 22	WATER TANKS FOR PRIVATE FIRE PROTECTION	2013 EDITION	NFPA 24	PRIVATE FIRE MAINS & THEIR APPURTENANCES	2016 EDITION	NFPA 25	STANDARD FOR INSPECTION, TESTING AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS	2013 EDITION	NFPA 72	NATIONAL FIRE ALARM CODE & SIGNALING CODE	2016 EDITION	NFPA 80	FIRE DOORS AND OTHER OPENING PROTECTIVES	2016 EDITION	NFPA 82	STANDARD FOR SMOKE CONTROL SYSTEMS	2015 EDITION	NFPA 253	CRITICAL RADIANT FLUX OF FLOOR COVERING SYSTEMS	2015 EDITION	NFPA 2001	CLEAN AGENT FIRE EXTINGUISHING SYSTEMS	2015 EDITION	IFC 300	ICC STANDARDS ON BLEACHERS, FOLDING AND TELESCOPING SEATING AND GRAND STANDS	2017 EDITION	UL 300	FIRE TESTING OF FIRE EXTINGUISHING SYSTEMS FOR PROTECTION OF RESTAURANT COOKING AREAS	2005 EDITION	UL 464	AUDIBLE SIGNAL APPLIANCES	2003 EDITION	UL 521	HEAT DETECTORS FOR FIRE PROTECTIVE SIGNALING SYSTEMS	1999 EDITION
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PROJECT NO. :1-30-50
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ISSUE NO.	DATE	DESCRIPTION	REVISION NO.	DATE	DESCRIPTION

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8756 MAST BOULEVARD, SANTEE, CA 92071
GROSSMONT UNION HIGH SCHOOL DISTRICT

TITLE SHEET & SHEET INDEX

T-1

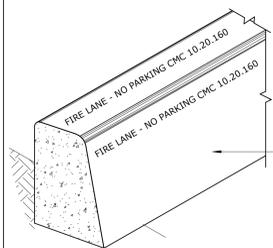
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 SS FLS ACS
 DATE: 03/11/2021

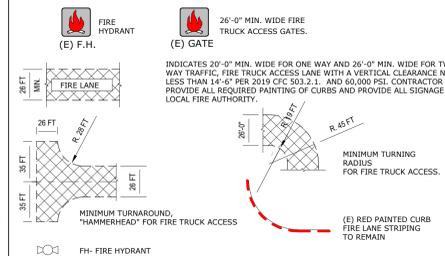
AGENCY APPROVAL
 FIRE NO. 39-98 4504-119771

**RUHNAU
 CLARKE**
 ARCHITECTS



(E) CONTINUOUS RED-PAINTED CURB (SEE SITE PLAN FOR EXTENT) W/4" HIGH WHITE STENCIL-PAINTED LETTERING, "NO PARKING-FIRE LANE CMC 10.20.160" PER CITY OF SANTEE FIRE DEPT. REQUIREMENTS, LETTERING SHALL BE A MAX. OF 30'-0" APART FROM THE BEGINNING AND END OF THE DESIGNATED FIRE LANE

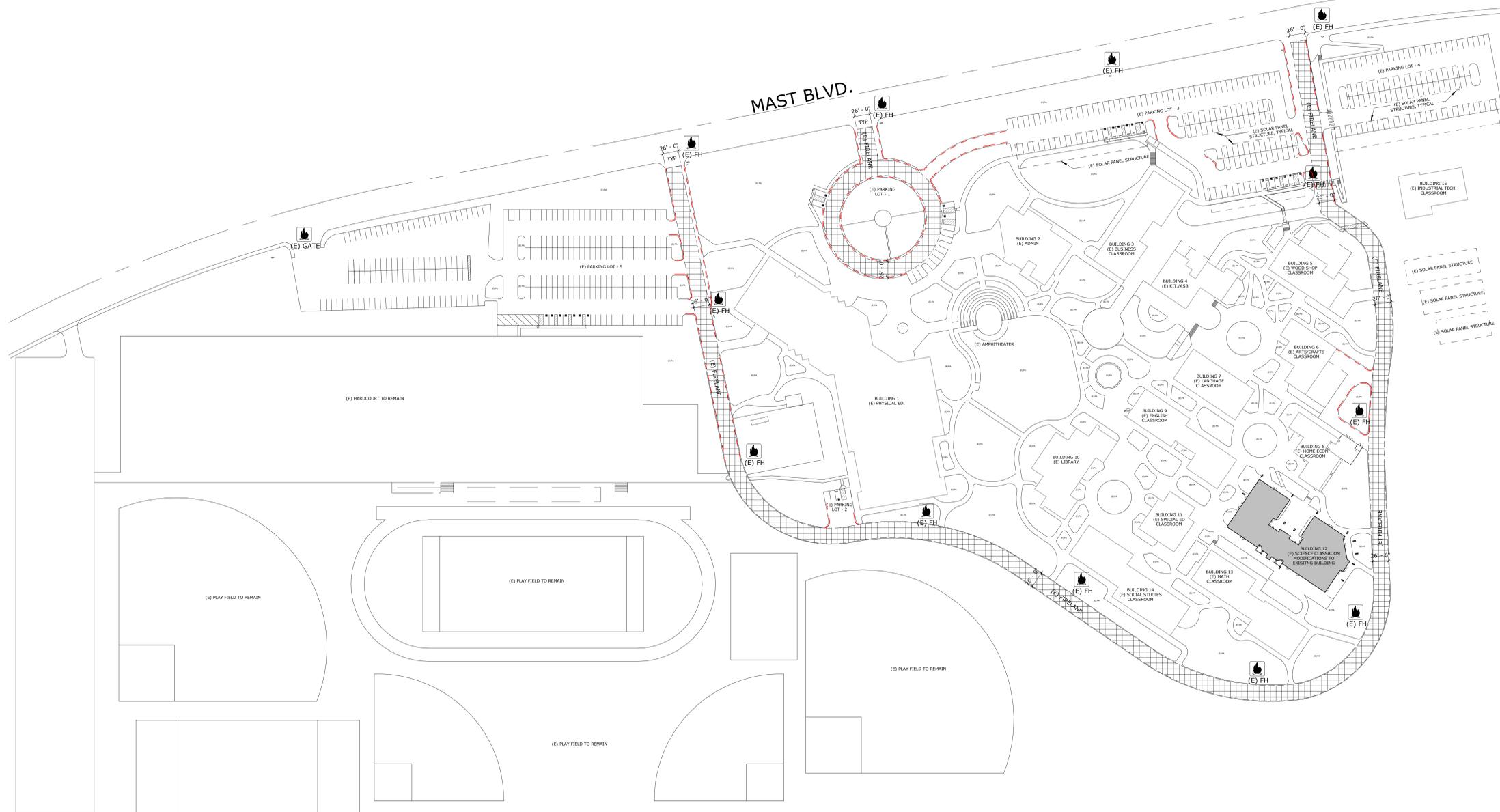
FIRE LANE CURB



FIRE LEGEND

STAMPS

CONSULTANT BRANDING



PROJECT No. :1-30-50
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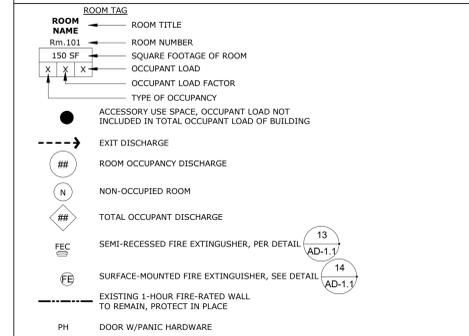


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 APP: 04-119771 INC.
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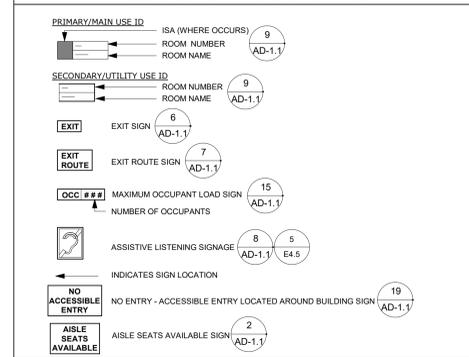
RUHNAU
 CLARKE
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CONSULTANT BRANDING

EGRESS & LIFE SAFETY LEGEND



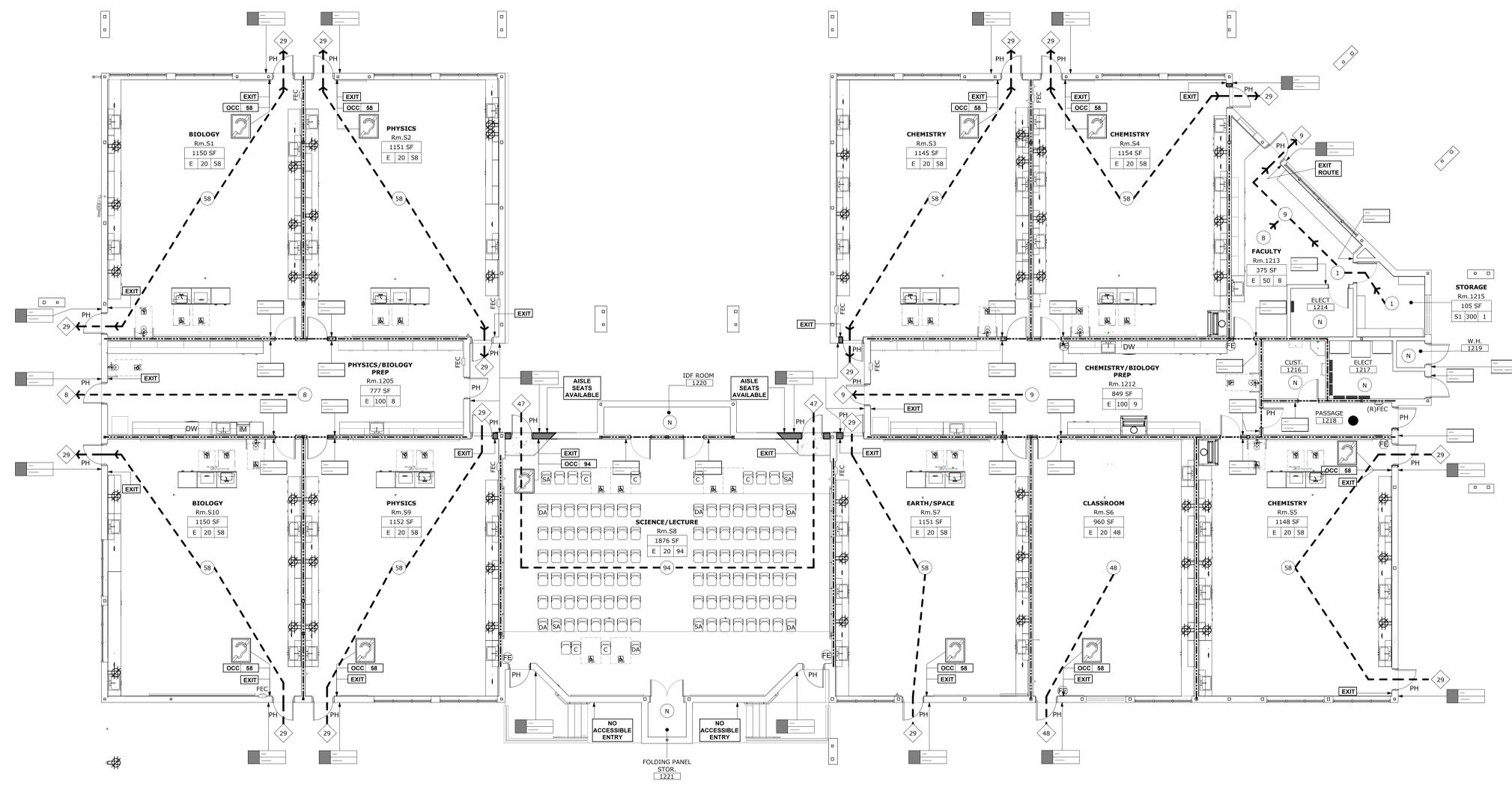
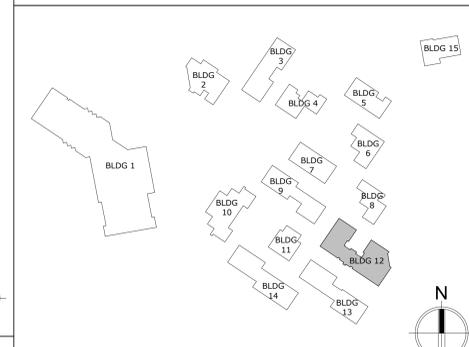
LEGEND - SIGNAGE



GENERAL EGRESS NOTES

- SEE SHEET AS-1.1 "OVERALL SITE PLAN" FOR BUILDING CODE ANALYSIS INFORMATION
 - PER SECTION 1010.1.10 IN THE CBC 2019, DOOR SERVING ROOMS OR SPACES WITH AN OCCUPANT LOAD OF 50 OR MORE ARE REQUIRED TO HAVE PANIC HARDWARE OR FIRE EXIT HARDWARE.
 - ROOM OCCUPANT LOADS FACTORED PER CBC 2019 SECTION 1004, TABLE 1004.1.2
 OCCUPANT LOAD = SQUARE FOOTAGE OF ROOM / OCCUPANT LOAD FACTOR
 - SUMMARY FOR MINIMUM EGRESS CLEARANCE PER 2019 CBC, SEC. 1005.3.2:
 DOORS: 0.2" CLR / PER OCC.
 (NOTE: 180 OCCUPANTS PER 36" WIDE DOOR)
 CORRIDOR: 0.2" CLR PER OCC.
 (NOTE: 44" MIN. WIDTH REQUIRED FOR OCC. LOAD UNDER 100 OCCUPANTS.)
 - EGRESS CALCULATIONS:
 WORST CASE PER SINGLE DOOR:
 48 OCC. X 0.2" PER OCC. = 9.6" NEEDED < 36" PROVIDED = OK
 - ALS CALCULATIONS:
 PROVIDE 2 PORTABLE DEVICES PER CLASSROOM OR 4% OF SEATING CAPACITY
- CLASSROOMS:**
 2 PORTABLE DEVICES X 9 CLASSROOMS = 18 TOTAL PORTABLE DEVICES FOR CLASSROOMS
- SCIENCE/LECTURE:**
 TOTAL SEATS 114 (INCLUDES WC & COMPANION SEATS) X 4% = 4.64 = 5 TOTAL LISTENING DEVICES
 TOTAL DEVICES NEEDED FOR PROJECT: 23
 25% OF LISTENING DEVICES TO BE HEARING AID COMPATIBLE = 23 X 25% = 5.75 = 6 DEVICES NEEDED

KEYPLAN



EGRESS & SIGNAGE FLOOR PLAN SCALE: 1/8" = 1'-0" 1

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SCIENCE BLDG. MODERNIZATION

**BUILDING 12
 EGRESS & SIGNAGE
 PLANS**

G-2

SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 12-29-2020

NO. OF OCCUPANTS	LOAD FACTOR	AREA REQUIRED	AREA PROVIDED
632	3 SF/OCCUPANTS	1,896 SF	2,092 SF

PATH OF TRAVEL (P.O.T.) AS INDICATED IS A BARRIER-FREE ACCESS ROUTE WITHOUT ANY ABRUPT VERTICAL CHANGES EXCEEDING 1/2" REVEALED AT 12" HORIZONTAL SLOPE, EXCEPT THAT LEVEL SWINGS DO NOT EXCEED 1/4" VERTICAL AND BE AT LEAST 48" HIGH. SURFACE IS TO BE MAINTAINED STABLE, FIRM AND SMOOTH. CROSS-SLOPE DOES NOT EXCEED 2% AND SLOPE IN THE DIRECTION OF TRAVEL IS LESS THAN 5% UNLESS OTHERWISE NOTED. P.O.T. SHALL BE MAINTAINED FREE OF OVERHANGING OBSTRUCTIONS TO 8' HORIZONTAL AND PROTRUSIVE OBJECTS GREATER THAN 4" PROTRUSION FROM WALL AND ABOVE 27" AND LESS THAN 60". ARCHITECT TO VERIFY THAT ALL BARRIERS IN THE PATH OF TRAVEL HAVE BEEN REMOVED OR WILL BE REMOVED UNDER THIS PROJECT, AND PATH OF TRAVEL COMPLES WITH DSG 118-505.8 & 118-504.

DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE STATEMENT: THE P.O.T. IDENTIFIED IN THESE CONSTRUCTION DOCUMENTS IS COMPLIANT WITH THE CURRENT APPLICABLE CALIFORNIA BUILDING CODE ACCESSIBILITY REQUIREMENTS FOR PATH OF TRAVEL REQUIREMENTS FOR ALTERATIONS, ADDITIONS AND STRUCTURAL REPAIRS. AS PART OF THE DESIGN OF THIS PROJECT, THE P.O.T. WAS EXAMINED AND ANY ELEMENTS, COMMENTS OR PORTIONS OF THE P.O.T. THAT WERE DETERMINED TO BE NON-COMPLIANT 1) HAVE BEEN IDENTIFIED AND 2) THE CONNECTIVE WORK NECESSARY TO BRING THEM INTO COMPLIANCE HAS BEEN INCLUDED WITHIN THE SCOPE OF THIS PROJECT'S WORK THROUGH DETAILED DRAWINGS AND SPECIFICATIONS INCORPORATED INTO THESE CONSTRUCTION DOCUMENTS. ANY NON-COMPLIANT ELEMENTS, COMMENTS OR PORTIONS OF THE P.O.T. THAT WILL NOT BE CORRECTED BY THIS PROJECT BASED ON VALUATION THRESHOLD LIMITATIONS OR A FINDING OF UNREASONABLE HARDSHIP ARE SO INDICATED IN THESE CONSTRUCTION DOCUMENTS. DURING CONSTRUCTION, IF P.O.T. ITEMS WITHIN THE SCOPE OF THE PROJECT REPRESENTED AS CODE COMPLIANT ARE FOUND TO BE NON-COMPLYING BEYOND REASONABLE CONSTRUCTION TOLERANCES, THEY SHALL BE REWORKED INTO COMPLIANCE WITH THE DSG AS A PART OF THIS PROJECT'S MEANS OF A CONSTRUCTION CHANGE DOCUMENT.

APPROVED DSA AP'S - CERTIFIED:
 A# 04-101272
 A# 04-109178
 A# 04-110255
 A# 04-111375
 A# 04-111765
 A# 04-113895
 A# 04-114667
 A# 04-115947
 A# 04-116222
 A# 04-116370
 A# 04-117858

	REGULAR PARKING	ACCESSIBLE REQUIRED	ACCESSIBLE PROVIDED	ACCESSIBLE VAN REQUIRED (IN LOT) IN ACCESSIBLE REQUIRED COUNT	ACCESSIBLE VAN PROVIDED (INCLUDING IN ACCESSIBLE REQUIRED COUNT)	TOTAL
(E) VISITOR PARKING LOT - 1	10	1	4	1	2	14
(E) STAFF PARKING LOT - 2	3	1	1	1	1	4
(E) STUDENT VISITOR PARKING LOT - 3	140	5	12	1	2	152
(E) STAFF PARKING LOT - 4	108	5	0	1	0	108
(E) STUDENT VISITOR PARKING LOT - 5	252	7	7	2	2	259
TOTAL COUNT:	513	11	24	6	7	537

LEGEND

- MODERNIZED BUILDING
- EXISTING BUILDING TO REMAIN
- EXISTING LANDSCAPE TO REMAIN
- EXISTING PAVING MARKING
- SAFE DISPERSAL AREA
- NEW CONCRETE PAVING/JOINT
- SITE PROPERTY LINE
- ASSUMED BUILDING PROPERTY LINE
- DRINKING FOUNTAIN
- (E) GIRLS RESTROOM - REFER TO DETAIL 4/AS-2.1
- (E) BOYS RESTROOM - REFER TO DETAIL 4/AS-2.1
- (E) WOMEN'S RESTROOM - REFER TO DETAIL 5/AS-2.1
- (E) MENS RESTROOM - REFER TO DETAIL 5/AS-2.1
- (E) FIRE HYDRANT TO REMAIN

UNLICENSED ARCHITECT
 C-20662
 03/11/2021
 STATE OF CALIFORNIA

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AGENCY APPROVAL
 PIN No. 30-36 4504-119771

RUHNAU CLARKE ARCHITECTS

SAFETY DISPERSAL CALCULATION

PATH OF TRAVEL (P.O.T.)

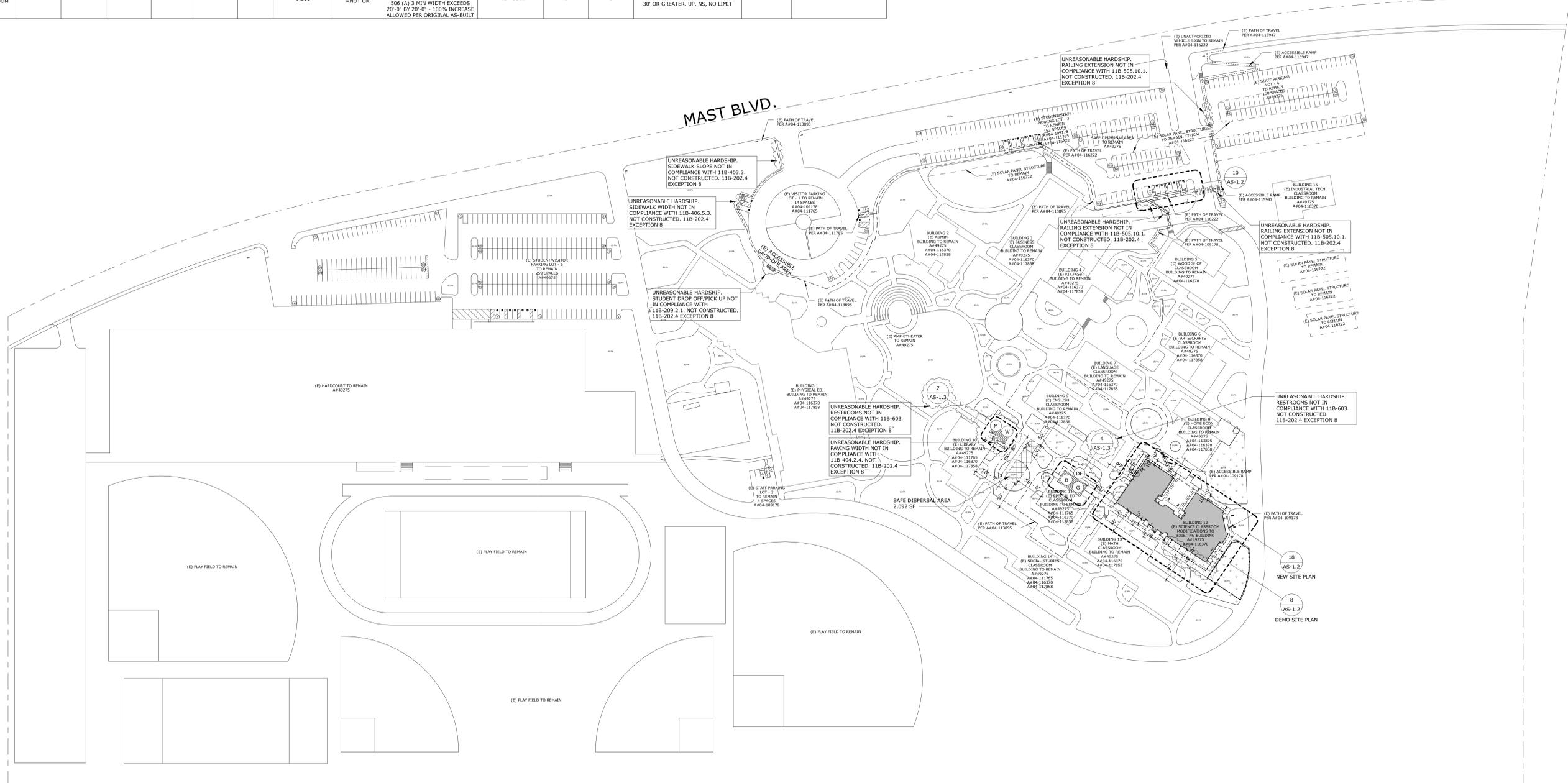
PARKING CALCULATION

LEGEND

BUILDING CODE ANALYSIS

BUILDING NUMBER	BUILDING NAME	OCCUPANCY TYPE SECTION 302	CONSTRUCTION TYPE SECTION 602	ALLOWABLE STORES TABLE 504.4	ACTUAL STORES	ALLOWABLE HEIGHT TABLE 504.3	ACTUAL HEIGHT	BUILDING AREA (SF)		FRONTAGE INCREASE AND AREA MODIFIED CALCULATION SECTION 506	MIXED USE/OCCUPANCY AREA CALCULATION SECTION 508	EXTERIOR WALL PROTECTION TABLE 601		OPENING PROTECTION TABLE 705.8	FIRE SPRINKLER	COMMENTS
								ALLOWABLE AREA (SF) TABLE 506.2	ACTUAL AREA (SF)			BEARING	NON-BEARING			
BLDG. 12	SCIENCE CLASSROOM	E	V-B	1	1	40'-0"	16'-10"	9,500	16,093 ± 9,500 =NOT OK	ALLOW AREA INCREASE DUE TO SEPARATION ALL SIDES PER SEC. 506 (A) 3 MIN WIDTH EXCEEDS 20'-0" BY 20'-0" - 100% INCREASE ALLOWED PER ORIGINAL AS-BUILT	NOT USED	0	0	20' TO LESS THAN 25', UP, NS: 45% & 25' TO LESS THAN 30', UP, NS: 70% & 30' OR GREATER, UP, NS: NO LIMIT	NO	

ABBREVIATIONS
 UP = UNPROTECTED
 NS = NONSPRINKLERED



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SCIENCE BLDG. MODERNIZATION

OVERALL SITE PLAN

AS-1.1

3775 TENTH STREET, BEVERLY HILLS CALIFORNIA 90208 (951) 684-4664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92008 (760) 438-3899

8756 MAST BOULEVARD, SANTEE, CA 92071
 GROSSMONT UNION HIGH SCHOOL DISTRICT



OVERALL SITE PLAN SCALE: 1" = 80'-0" 1

SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 12-29-2020



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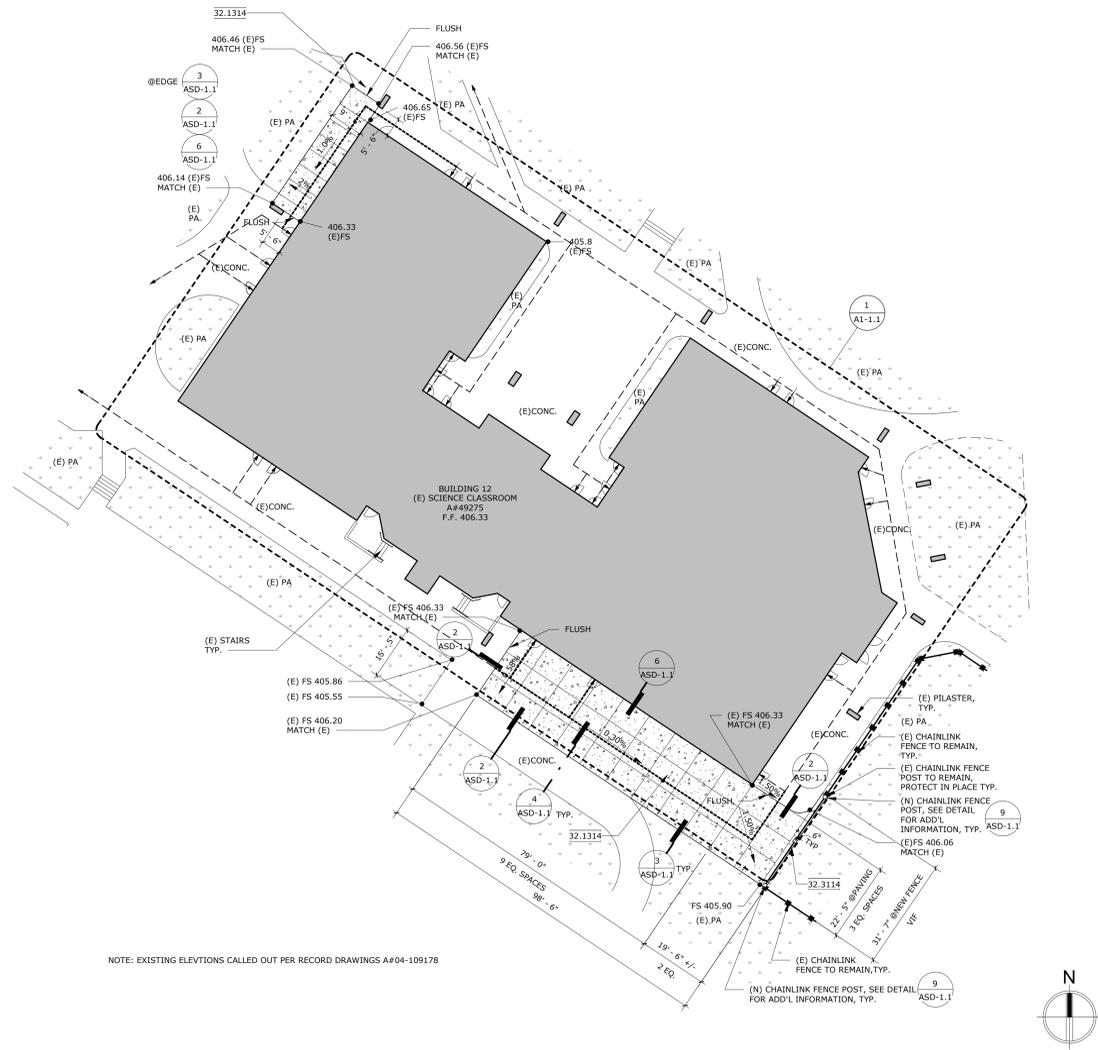
CONSULTANT BRANDING

KEYNOTES

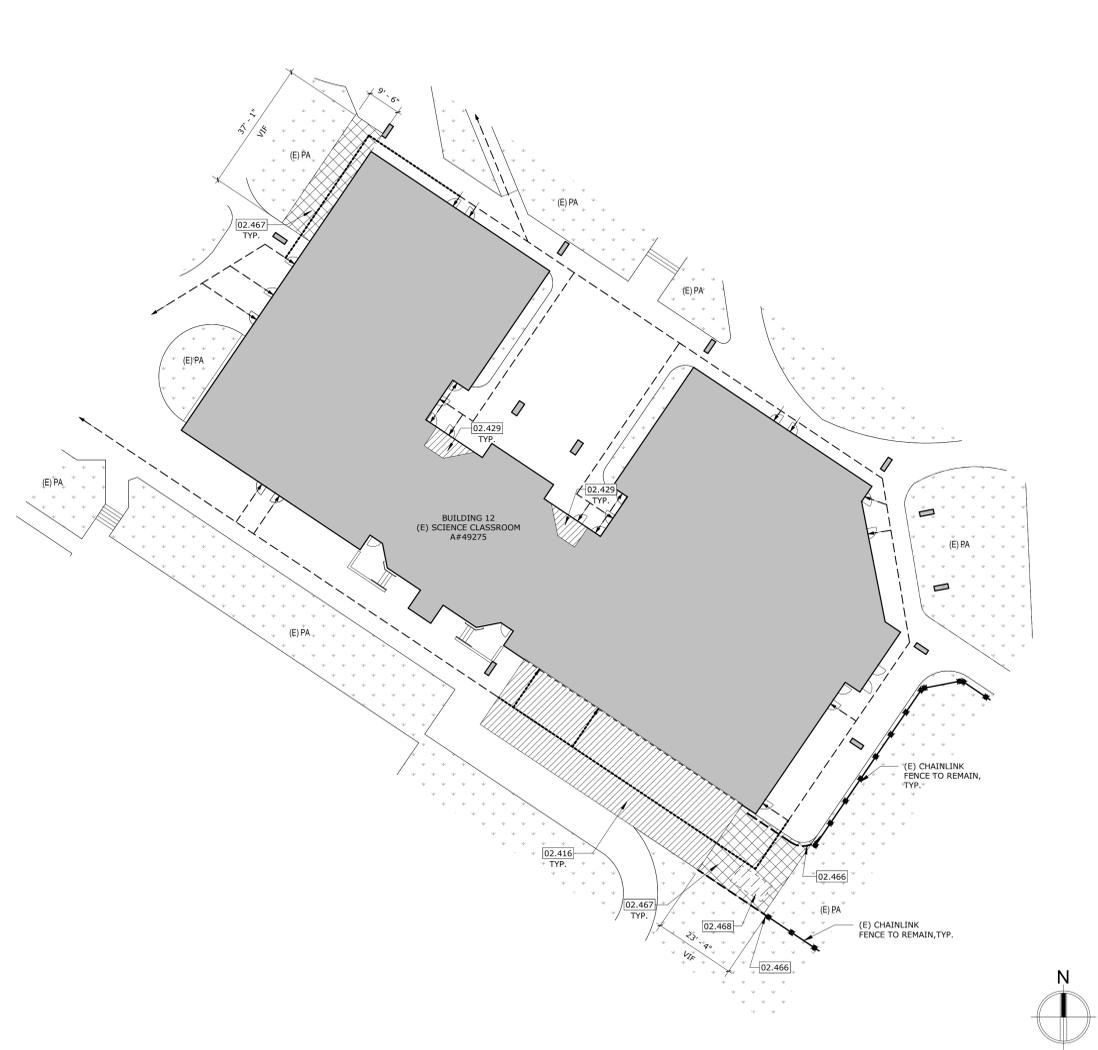
- NEW CONSTRUCTION PLAN KEYNOTE
- 02.222 (E) CONCRETE PAVING TO REMAIN, PROTECT IN PLACE
 - 02.223 (E) CONCRETE ASPHALT PAVING TO REMAIN, PROTECT IN PLACE
 - 02.224 (E) ACCESSIBLE VAN PARKING SIGN TO REMAIN, PROTECT IN PLACE
 - 02.226 (E) ACCESSIBLE PARKING SIGN TO REMAIN, PROTECT IN PLACE
 - 02.227 (E) CONCRETE WHEEL STOP TO REMAIN, PROTECT IN PLACE
 - 02.228 (E) ACCESSIBLE PARKING EMBLEM TO REMAIN, PROTECT IN PLACE
 - 02.229 (E) DETECTABLE WARNING TILE TO REMAIN, PROTECT IN PLACE
 - 02.230 (E) LANDSCAPE TO REMAIN, PROTECT IN PLACE
 - 02.232 (E) FLUSH TRANSITION TO REMAIN, PROTECT IN PLACE
 - 02.233 (E) "NO PARKING" LETTERING TO REMAIN, PROTECT IN PLACE
 - 02.234 (E) STRIPING TO REMAIN, PROTECT IN PLACE
 - 02.416 DEMOLISH (GREEN HOUSE) PORTION OF (E) BUILDING IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO LOW CONCRETE WALLS, CONCRETE PAVING, ETC. PATCH & REPAIR EXISTING LANDSCAPE AND HARDSCAPE.
 - 02.429 REMOVE (E) CONCRETE PAVING
 - 02.466 REMOVE (E) CHAINLINK FENCE AND FOOTINGS
 - 02.467 REMOVE (E) LANDSCAPE
 - 02.468 REMOVE (E) TEMPORARY STRUCTURE
 - 32.1314 (N) CONCRETE PAVING
 - 32.3114 (N) CHAIN LINK FENCE PER DETAIL 9/ASD-1.1

LEGEND

- MODERNIZED BUILDING
- EXISTING LANDSCAPE TO REMAIN
- NEW CONCRETE PAVING/JOINT
- DEMOLISH EXISTING GREEN HOUSE
- DEMOLISH EXISTING LANDSCAPE
- DEMOLISH (E) CHAINLINK FENCE
- EXISTING 6' HT. CHAINLINK FENCE TO REMAIN
- NEW 6' HT. CHAINLINK FENCE, SEE DETAIL 9/ASD.1.1
- (E) P.O.T. A# 04-109178
- (E) P.O.T. A# 04-113895
- (E) P.O.T. A# 04-115947
- (E) P.O.T. A# 04-116222
- (N) P.O.T.



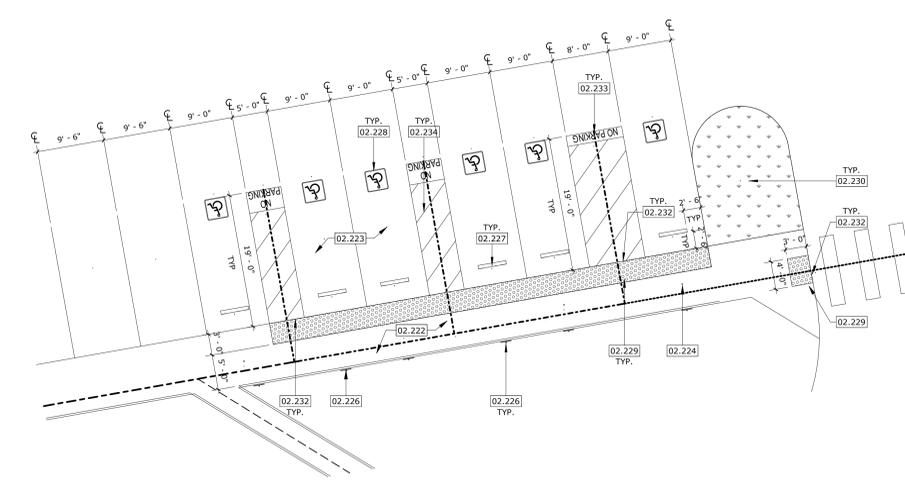
ENLARGED NEW SITE PLAN SCALE: 1" = 20'-0" 18



ENLARGED DEMO SITE PLAN SCALE: 1" = 20'-0" 8

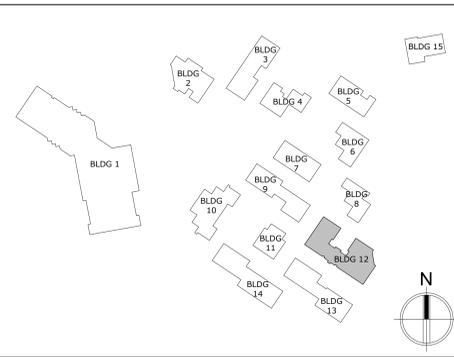
GENERAL NOTES-DEMO SITE PLAN

1. ALL EXISTING CONDITIONS TO REMAIN UNLESS NOTED OTHERWISE.
2. PATCH AND REPAIR ANY PAVING DAMAGED CAUSED BY DEMOLITION. REPAIR TO MATCH EXISTING.
3. FIRE PROTECTION DURING DEMOLITION AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CFC CHAPTER 33.
4. BUILDINGS AND PORTABLE BUILDINGS WHICH ARE INDICATED TO BE DEMOLISHED SHALL BE DISCONNECTED AND HAVE ALL UTILITIES, INCLUDING BUT NOT LIMITED TO ELECTRICAL, PLUMBING, FOUNDATION, CONCRETE OR ASPHALT PADS, MECHANICAL ELEMENTS TO BE REMOVED FROM ITS ORIGIN CONNECTION POINT.
5. GENERAL CONTRACTOR TO CLEAN DEBRIS FROM DRAIN INLETS ALONG TOE OF EXISTING AND NEW SLOPE AREAS, TYPICAL.
6. CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF ALL EXISTING UNDERGROUND POWER, DATA, LOW VOLTAGE, OTHER UTILITY CONDUITS, VAULTS AND IN-GROUND UTILITY STRUCTURES WITHIN SCOPE OF WORK.



(E) PARKING PLAN SCALE: 1" = 10'-0" 10

KEYPLAN



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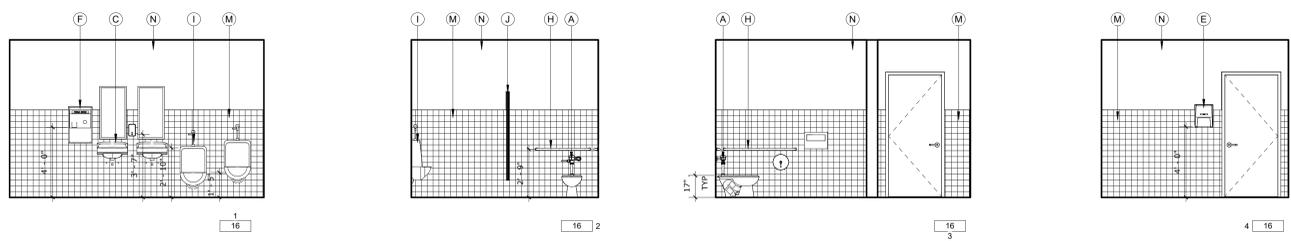
ENLARGED SITE PLANS **AS-1.2**

SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 12-29-2020

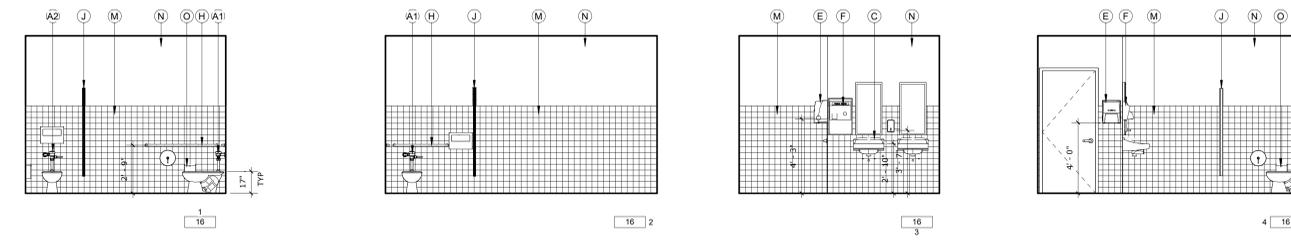


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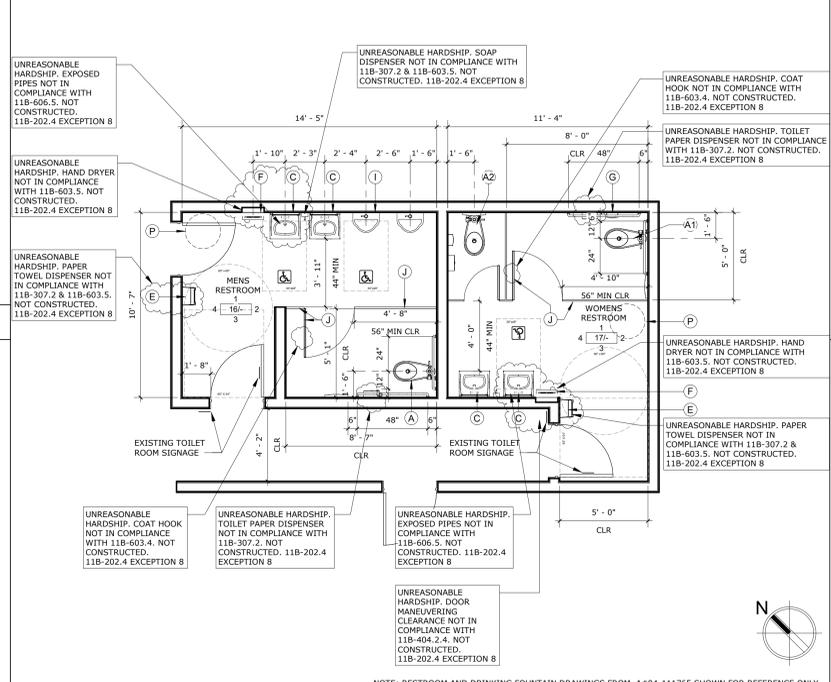
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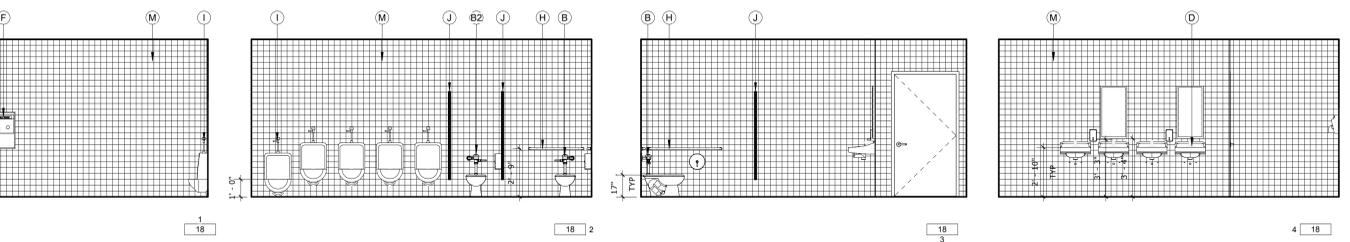
MENS RESTROOM ELEVATIONS SCALE: 1/4" = 1'-0" 16



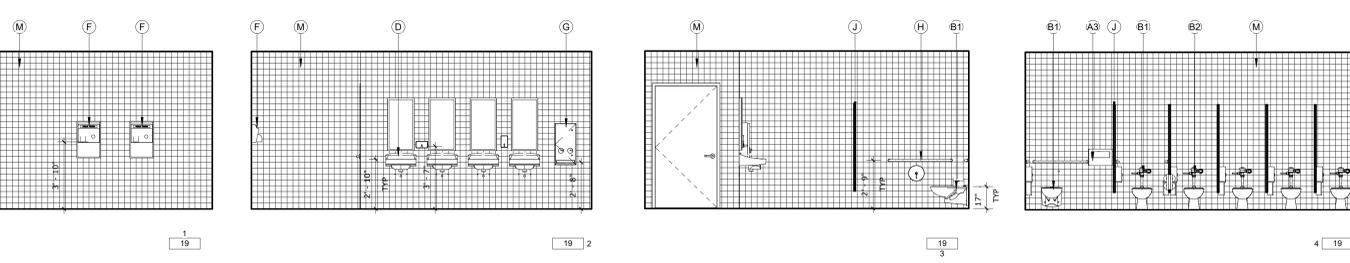
WOMENS RESTROOM ELEVATIONS SCALE: 1/4" = 1'-0" 17



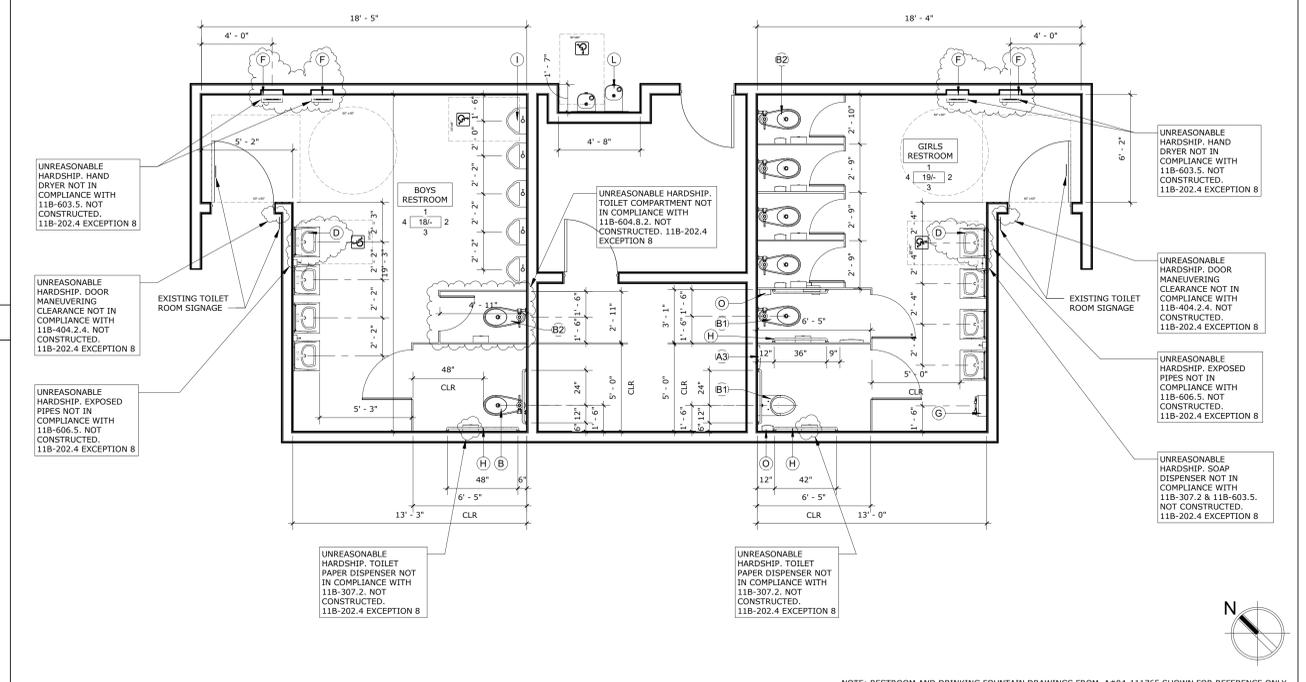
EXISTING ENLARGED STAFF RESTROOMS SCALE: 1/4" = 1'-0" 7



BOYS RESTROOM ELEVATIONS SCALE: 1/4" = 1'-0" 18



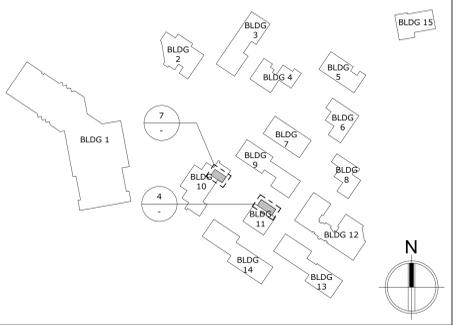
GIRLS RESTROOM ELEVATIONS SCALE: 1/4" = 1'-0" 19



EXISTING ENLARGED STUDENT RESTROOMS SCALE: 1/4" = 1'-0" 4

- TOILET ACCESSORIES KEY NOTES:**
- A. EXISTING FACULTY MENS' ACCESSIBLE TOILET, EXISTING SURFACE MTD TOILET TISSUE DISPENSER, EXISTING SURFACE MOUNTED TOILET SEAT COVER DISPENSER TO REMAIN.
 - A1. EXISTING FACULTY WOMENS' ACCESSIBLE TOILET, EXISTING SURFACE MTD TOILET TISSUE DISPENSER, EXISTING SURFACE MOUNTED SANITARY NAPKIN DISPOSAL, EXISTING SURFACE MOUNTED TOILET SEAT COVER DISPENSER TO REMAIN.
 - A2. EXISTING FACULTY TOILET WITH TOILET PARTITION AND EXISTING ACCESSORIES TO REMAIN, EXISTING SURFACE MTD TOILET TISSUE DISPENSER, EXISTING SURFACE MOUNTED SANITARY NAPKIN DISPOSAL, EXISTING SURFACE MOUNTED TOILET SEAT COVER DISPENSER TO REMAIN.
 - A3. EXISTING SURFACE MOUNTED TOILET SEAT COVER DISPENSER TO REMAIN.
 - B. EXISTING STUDENT BOYS' ACCESSIBLE TOILET, EXISTING SURFACE MTD TOILET TISSUE DISPENSER TO REMAIN.
 - B1. EXISTING STUDENT GIRLS' ACCESSIBLE TOILET, EXISTING SURFACE MTD TOILET TISSUE DISPENSER, EXISTING SURFACE MOUNTED SANITARY NAPKIN DISPOSAL TO REMAIN.
 - B2. EXISTING STUDENT TOILET WITH TOILET PARTITIONS AND EXISTING ACCESSORIES TO REMAIN, EXISTING SURFACE MTD TOILET TISSUE DISPENSER, EXISTING SURFACE MOUNTED SANITARY NAPKIN DISPOSAL TO REMAIN.
 - C. EXISTING FACULTY ACCESSIBLE LAVATORY WITH EXISTING 24X30 MIRROR AND EXISTING SURFACE MTD SOAP DISPENSER.
 - D. EXISTING STUDENT ACCESSIBLE LAVATORY WITH EXISTING 24X30 MIRROR AND EXISTING SURFACE MTD SOAP DISPENSER.
 - E. EXISTING FACULTY SURFACE MTD PAPER TOWEL DISPENSER.
 - E1. EXISTING STUDENT SURFACE MTD PAPER TOWEL DISPENSER.
 - F. EXISTING RECESSED ELECTRICAL HAND DRYER (4" MAX. PROJECTION).
 - G. EXISTING SURFACE MOUNTED NAPKIN/TAMPON DISPENSER.
 - H. EXISTING GRAB BARS TO REMAIN.
 - I. EXISTING ACCESSIBLE URINAL TO REMAIN.
 - J. EXISTING TOILET PARTITION AND DOOR TO REMAIN.
 - K. NOT USED.
 - L. EXISTING ACCESSIBLE H/LOW DUAL DRINKING FOUNTAIN TO REMAIN.
 - M. EXISTING CERAMIC WALL TILE TO REMAIN, FILL HEIGHT @ STUDENTS RESTROOMS & 60" WAINSCOT @ STAFF RESTROOMS.
 - N. EXISTING PAINTED CYPBOARD FINISH TO REMAIN.
 - O. EXISTING SURFACE MOUNTED NAPKIN/TAMPON DISPOSAL UNIT.
 - P. EXISTING MOVABLE 24" DIA. PLASTIC TRASH CAN.

RESTROOM KEYNOTES SCALE: 1/8" = 1'-0" 10



KEYPLAN SCALE: 1/8" = 1'-0" 11

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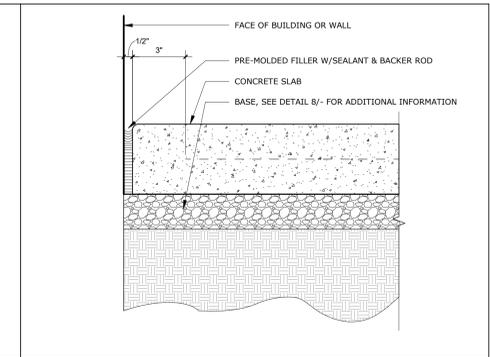
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SCIENCE BLDG. MODERNIZATION

ENLARGED SITE PLANS AS-1.3

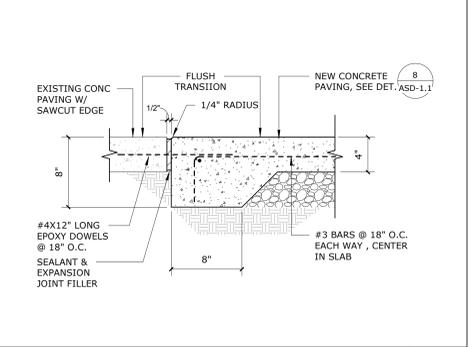
SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 12-29-2020



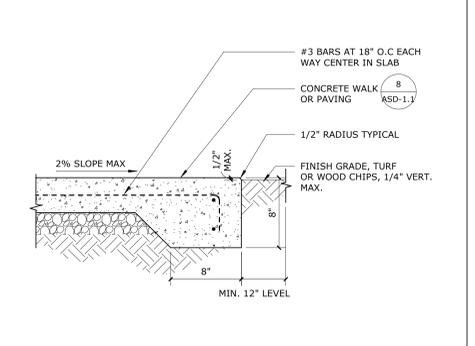
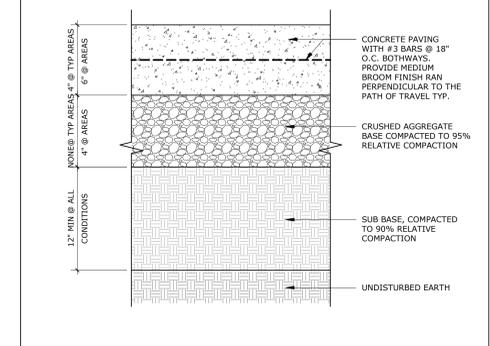
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BUILDING/WALL PAVING EDGE SCALE: 3" = 1'-0" **6**

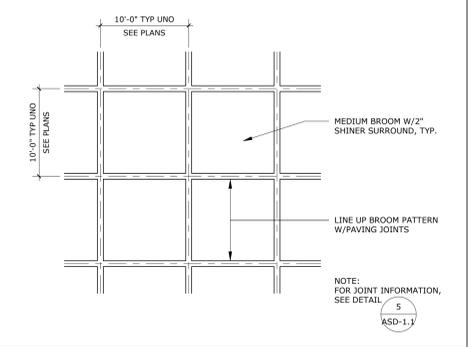
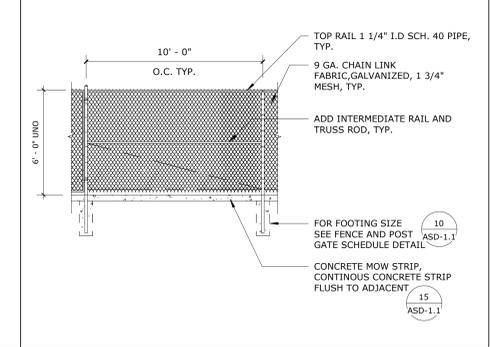


(E) TO (N) CONCRETE PAVING SCALE: 1/2" = 1'-0" **2**



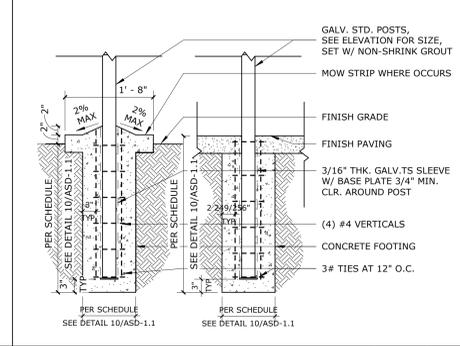
CONCRETE PAVING SCALE: 12" = 1'-0" **8**

CONCRETE EDGE SCALE: 1/2" = 1'-0" **3**

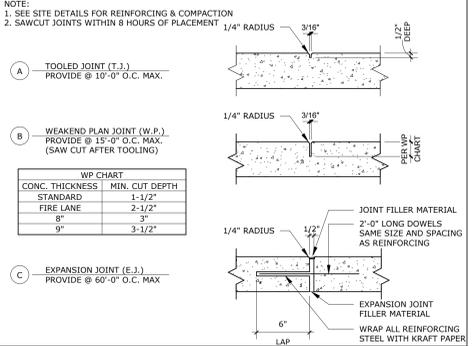


CHAIN LINK FENCE ELEVATION SCALE: 1/4" = 1'-0" **9**

CONCRETE PAVING JOINTS SCALE: 1/4" = 1'-0" **4**



CHAINLINK FENCE SCHEDULE									
POST	POST SIZE	POST DIA.							
1	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"
2	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	1 1/2"
3	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"
4	2"	2"	2"	2"	2"	2"	2"	2"	2"
5	2 1/4"	2 1/4"	2 1/4"	2 1/4"	2 1/4"	2 1/4"	2 1/4"	2 1/4"	2 1/4"
6	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"
7	2 3/4"	2 3/4"	2 3/4"	2 3/4"	2 3/4"	2 3/4"	2 3/4"	2 3/4"	2 3/4"
8	3"	3"	3"	3"	3"	3"	3"	3"	3"
9	3 1/4"	3 1/4"	3 1/4"	3 1/4"	3 1/4"	3 1/4"	3 1/4"	3 1/4"	3 1/4"
10	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"
11	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"
12	4"	4"	4"	4"	4"	4"	4"	4"	4"
13	4 1/4"	4 1/4"	4 1/4"	4 1/4"	4 1/4"	4 1/4"	4 1/4"	4 1/4"	4 1/4"
14	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"
15	4 3/4"	4 3/4"	4 3/4"	4 3/4"	4 3/4"	4 3/4"	4 3/4"	4 3/4"	4 3/4"
16	5"	5"	5"	5"	5"	5"	5"	5"	5"
17	5 1/4"	5 1/4"	5 1/4"	5 1/4"	5 1/4"	5 1/4"	5 1/4"	5 1/4"	5 1/4"
18	5 1/2"	5 1/2"	5 1/2"	5 1/2"	5 1/2"	5 1/2"	5 1/2"	5 1/2"	5 1/2"
19	5 3/4"	5 3/4"	5 3/4"	5 3/4"	5 3/4"	5 3/4"	5 3/4"	5 3/4"	5 3/4"
20	6"	6"	6"	6"	6"	6"	6"	6"	6"



FENCE POST FOOTING SCALE: 3/4" = 1'-0" **15**

FENCE & GATE POST SCHEDULE SCALE: 1/2" = 1'-0" **10**

CONCRETE EDGE SCALE: 1/2" = 1'-0" **5**

PROJECT No. 1-30-50
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3775 TENTH STREET, AVERSIIDE CALIFORNIA 92505 (951) 684-4664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92008 (619) 438-5899

SCIENCE BLDG. MODERNIZATION

8756 MAST BOULEVARD, SANTEE, CA 92071
GROSSMONT UNION HIGH SCHOOL DISTRICT

SITE DETAILS

ASD-1.1

SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 12-29-2020



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STAMPS
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KEYNOTES
 DEMOLITION KEYNOTE LEGEND

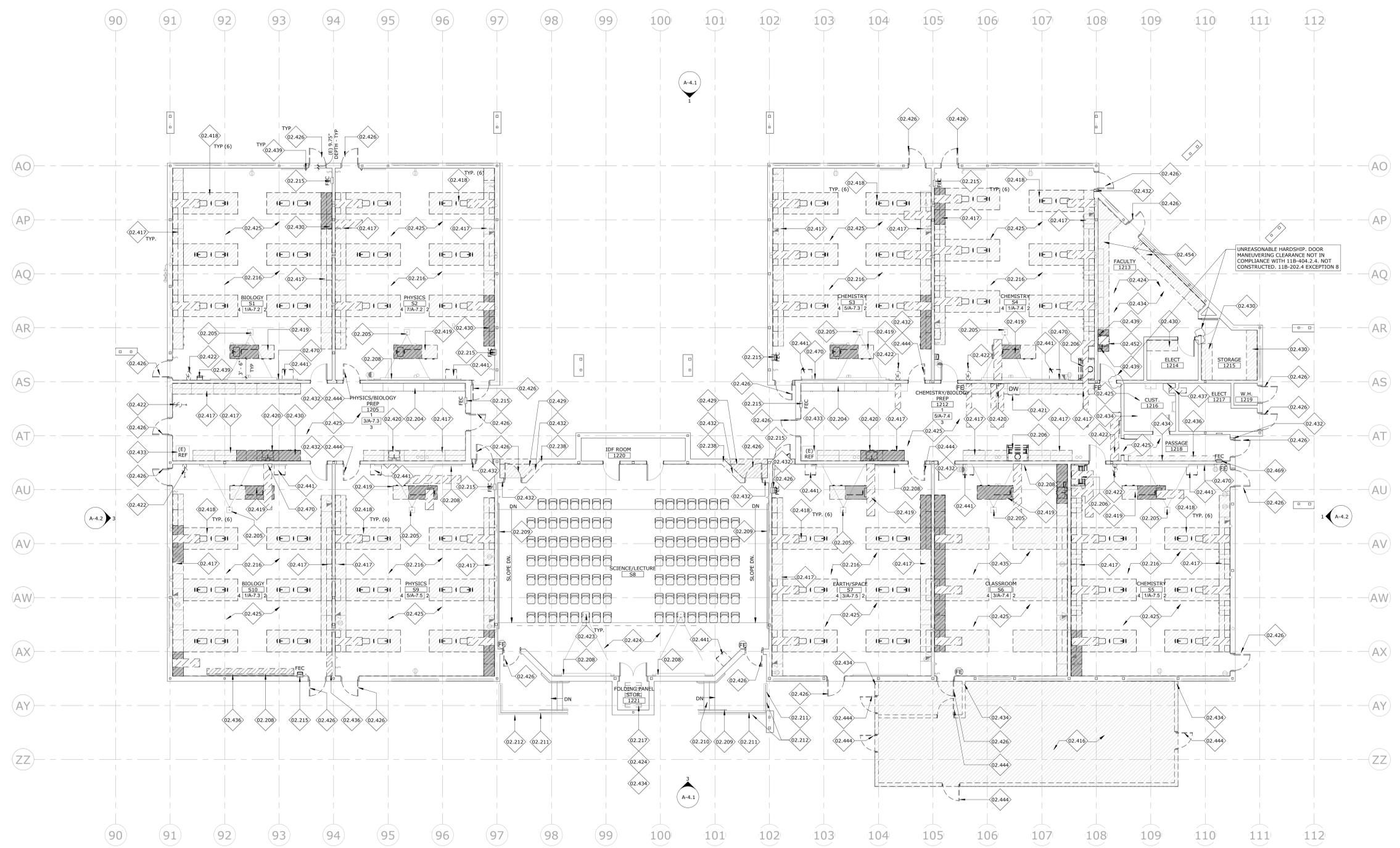
- 02.204 (E) CASEWORK TO REMAIN, PROTECT IN PLACE
- 02.205 (E) CEILING MOUNTED PROJECTOR PER A#04-109178 TO REMAIN, PROTECT IN PLACE
- 02.206 (E) FUME HOOD TO BE REMOVED AND REPLACED WITH NEW ACCESSIBLE COMPLIANT FUME HOOD IN EXISTING LOCATION, CONTRACTOR TO COORDINATE WITH EXISTING HOOD CONNECTIONS, ELECTRICAL/MECHANICAL DRAWINGS, ETC.
- 02.208 (E) MARKERBOARD TO REMAIN, PROTECT IN PLACE
- 02.209 (E) 1-1/2" DIA. HANDRAIL TO REMAIN, PROTECT IN PLACE
- 02.210 (E) CONCRETE STAIRS TO REMAIN, PROTECT IN PLACE
- 02.211 (E) GUARDRAIL TO REMAIN, PROTECT IN PLACE
- 02.212 (E) CONCRETE WALL TO REMAIN, PROTECT IN PLACE
- 02.215 (E) FIRE EXTINGUISHER CABINET TO REMAIN, PROTECT IN PLACE
- 02.216 REFURBISH (E) REMAINING LAB UPPER CASEWORK, LOWER CASEWORK, CABINETS, ETC. TO LIKE NEW CONDITION, TYPICAL.
- 02.217 REFURBISH (E) MOVABLE WALL, PATCH & REPAIR PARTITION TO ENSURE SMOOTH OPERATION
- 02.238 (E) SHEARWALL AND HOLDINGS TO REMAIN, PROTECT IN PLACE, REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION
- 02.416 DEMOLISH (GREEN HOUSE) PORTION OF (E) BUILDING IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO LOW CONCRETE WALLS, CONCRETE AVENUE, ETC. PATCH & REPAIR EXISTING LANDSCAPE AND HARDSCAPE.
- 02.417 REMOVE AND REPLACE (E) EPOXY COUNTER TOP AND BACK SPLASH, REFURBISH (E) BASE CABINETS TO LIKE NEW CONDITION, TYPICAL. PATCH/REPAIR WALL AS REQUIRED BEFORE INSTALLATION OF NEW COUNTER TOP AND BACKSPLASH.
- 02.418 REMOVE (E) STUDENT PENINSULA IN ITS ENTIRETY INCLUDING BUT NOT LIMITED TO SINK, PLUMBING LINES, ELECTRICAL SYSTEM. SEE PLUMBING AND ELECTRICAL DWG. FOR MORE INFO
- 02.419 REMOVE AND REPLACE (E) TEACHER STATION COUNTER TOP, SINK, FAUCET AND GAS TURBET, REFURBISH (E) BASE CABINETS, TYPICAL. SEE PLUMBING & ELECTRICAL DWG. FOR MORE INFO
- 02.420 REMOVE AND REPLACE (E) SINK
- 02.421 REMOVE AND REPLACE (E) DISH WASHER
- 02.422 REMOVE AND REPLACE (E) DRYWASH W/NEW ADA COMPLIANT EYE WASH
- 02.423 REMOVE AND REPLACE (E) FIXED SEATING PER NEW CONFIGURATION
- 02.424 REMOVE (E) CABINET AND BASE BOARD, SEE DEMO FLR. PLAN GENERAL NOTE#1 FOR ADDITIONAL INFORMATION
- 02.425 REMOVE AND REPLACE (E) VCT FLOOR FINISH AND WALL BASE BOARD, SEE DEMO FLR. PLAN GENERAL NOTE#1 FOR ADDITIONAL INFORMATION
- 02.426 REMOVE (E) DOOR/FRAME/SLIDING TRANSOM
- 02.429 REMOVE (E) CONCRETE PAVING
- 02.430 REMOVE (E) CASEWORK. PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH.
- 02.432 REMOVE (E) PORTION OF WALL
- 02.433 REMOVE AND REPLACE (E) REFRIGERATOR
- 02.434 PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH. ANY RATED WALL SHALL BE REPAIRED TO KEEP EXISTING RATING FOR THAT WALL
- 02.435 REMOVE ALL (E) CASEWORK, CAPPING, SINKS AND UTILITIES. PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH.
- 02.436 REMOVE ALL (E) SHELVING. PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH.
- 02.437 REMOVE AND REPLACE (E) FRP WALL FINISH. PATCH/REPAIR WALL PRIOR TO PLACING NEW FRP WALL FINISH.
- 02.439 RELOCATE ITEM TO ACCESSIBLE HEIGHT. PATCH/REPAIR/PAINT WALL PRIOR TO PLACING ITEM IN NEW HEIGHT LOCATION. MATCH (E) ADJACENT WALL MATERIAL AND FINISH.
- 02.441 REMOVE (E) TECHNOLOGY BASE CABINET. PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH.
- 02.444 REMOVE (E) DOOR/FRAME
- 02.452 REMOVE AND REPLACE (E) COUNTER TOP, SINK, FAUCET, BASE CABINET, TYPICAL. PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH. SEE PLUMBING & ELECTRICAL DWG. FOR MORE INFO
- 02.454 REMOVE AND REPLACE (E) PLASTIC LAMINATE COUNTER TOP AND BACK SPLASH. REFURBISH (E) BASE CABINETS TO LIKE NEW CONDITION, TYPICAL. PATCH/REPAIR WALL AS REQUIRED BEFORE INSTALLATION OF NEW COUNTER TOP AND BACKSPLASH.
- 02.469 REMOVE AND RELOCATE (E) RECESSED FIRE EXTINGUISHER CABINET. PATCH/REPAIR/PAINT (E) RATED WALL TO MATCH ADJACENT MATERIAL AND FINISH
- 02.470 REMOVE AND REPLACE (E) MARKERBOARD, PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH

- LEGEND**
- DEMO (E) PENINSULA'S W/SINKS, GAS TURBETS, EPOXY COUNTER TOPS, FIXED SEATING & SHELVING
 - DEMO (E) CONCRETE PAVING
 - DEMO (E) BASE CASEWORK - SEE GENERAL NOTE-DEMO FLR. PLAN #6 BELOW
 - (E) FIRE EXTINGUISHER CABINET TO REMAIN
 - (E) SURFACE-MOUNTED FIRE EXTINGUISHER TO REMAIN
 - DEMO (E) DOOR
 - DEMO (E) FLOORING & CONCRETE PAVING FOR NEW TRENCHING. SEE PLUMBING & STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION

GENERAL NOTES-DEMO FLR. PLAN

1. WHERE EXISTING FLOOR FINISHES ARE SHOWN TO BE REMOVED, CONTRACTOR TO SCRAPE ALL ADHESIVES FROM FLOOR SUBSTRATE TO BE READY TO ACCEPT NEW FLOOR FINISH MATERIAL.
2. CONTRACTOR TO REMOVE WALL BASE MATERIAL WHERE EXISTING FLOOR FINISHES ARE SHOWN TO BE REMOVED.
3. WHERE EXISTING WALL FRAMING OR PARTITIONS ARE SHOWN TO BE REMOVED, CONTRACTOR TO REMOVE SAFE-OFF/CAP ALL CONCEALED UTILITIES OCCURRING WITHIN THE WALL CAVITY IN PREPARATION OF NEW CONSTRUCTION IN CONDITIONS WHERE EXISTING POWER/DATA/LOW VOLTAGE UTILITIES WITHIN THE WALLS CAN BE SALVAGED AND INCORPORATED INTO THE NEW CONSTRUCTION WORK. CONTRACTOR TO UTILIZE CARE AND PROTECT (E) ITEMS INTENDED FOR RE-USE. IF RE-USED ITEMS SHOW DAMAGE, DISTRICT RESERVES THE RIGHT TO HAVE THESE ITEMS BE OF NEW CONSTRUCTION.
4. WHERE DEMOLITION WORK HAS OCCURRED AT EXISTING WALL CONSTRUCTION AND THE EXISTING WALL FINISHES HAVE BEEN DAMAGED AS A RESULT OF THE DEMOLITION WORK CONTRACTOR SHALL REPLACE DAMAGED WALL FRAMING MEMBERS AND WALL FINISHES WITH NEW SIMILAR MATERIALS, PATCH AND PREPARE WALLS FOR NEW PAINTED FINISH.
5. PROTECT ALL EXISTING WALLS, WINDOWS, DOORS AND CASEWORK IN PLACE U.N.O.
6. REMOVE AND RELOCATE ALL UPPER CASEWORK IN ALL CLASSROOMS AND FACULTY ROOM (SPACES S1, S2, S3, S4, S5, S6, S7, S8, S9, S10 1212), PROVIDE NEW BACKING FOR ALL UPPER AND LOWER CASEWORK, TYPICAL.

KEYPLAN



FLOOR PLAN - DEMO, SCALE: 1/8" = 1'-0" 1

PROJECT No. :1-30-50
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SCIENCE BLDG. MODERNIZATION

BUILDING 12 FLOOR PLAN - DEMO. **A-1.0**

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 PIN No. 39-46 404-119771

CONSULTANT BRANDING

KEYNOTES

- NEW CONSTRUCTION PLAN KEYNOTE
- 02.202 (E) DOOR TO REMAIN, PROTECT IN PLACE
- 02.204 (E) CASEWORK TO REMAIN, PROTECT IN PLACE
- 02.205 (E) CEILING MOUNTED PROTECTOR PER A4M-109178 TO REMAIN, PROTECT IN PLACE
- 02.208 (E) MARKERBOARD TO REMAIN, PROTECT IN PLACE
- 02.209 (E) 1-1/2" DIA. HANDRAIL TO REMAIN, PROTECT IN PLACE
- 02.211 (E) GUARDRAIL TO REMAIN, PROTECT IN PLACE
- 02.212 (E) CONCRETE WALL TO REMAIN, PROTECT IN PLACE
- 02.213 (E) TACK BOARD TO REMAIN, PROTECT IN PLACE
- 02.434 PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH.
- 02.462 ANY RATED WALL SHALL BE REPAIRED TO KEEP EXISTING RATING FOR THAT WALL
- RELOCATE (E) CASEWORK. REPAIR/REFINISH AS REQUIRED. (E) UPPER CABINETES TO BE REINSTALLED PER DEMO GENERAL NOTE #5
- 06.116 (N) WALL INFILL TO MATCH (E) ADJACENT STUD AND FINISHES.
- 06.404 RELOCATED UPPER CASEWORK, PROVIDE NEW BLOCKING AS NEEDED, TYPICAL, SEE DETAIL 13/AD-1.2
- 06.415 (N) EPOXY COUNTERTOP WITH 4" BACKSPLASH
- 06.417 (N) TEACHERS STATION COUNTERTOP WITH SINK, FAUCET & GAS TURRET
- 06.419 (N) CASEWORK PER INTERIOR ELEVATION
- 06.421 (N) PLASTIC LAMINATE COUNTERTOP WITH 4" BACKSPLASH
- 08.111 (N) DOOR PER SCHEDULE.
- 08.112 (N) DOOR, FRAME AND TRANSOM GLAZING, SEE DOOR SCHEDULE
- 09.613 (N) FLOOR FINISH, SEE ROOM FINISH SCHEDULE.
- 10.112 RELOCATED MARKERBOARD
- 10.287 RELOCATED SOAP/SANITIZER DISPENSER
- 10.288 PAPER TOWEL DISPENSER
- 11.413 (N) REFRIGERATOR, CFCI, MODEL#R6C30RGA BY FISCHER SCIENTIFIC
- 11.470 (N) ICE MACHINE, CFCI, MODEL#UN324-KUFM24 BY SCOTSMAN
- 11.521 (N) 16"9 PROTECTION SCREEN
- 12.530 (N) FIXED SEATING
- 22.405 (N) SINK/FAUCET PER PLUMBING DWG.
- 22.415 (N) GLASS WASHER, CFCI, MODEL#401001000 BY LABCONCO
- 22.416 (N) ACCESSIBLE SINK/FAUCET PER PLUMBING DWG.
- 22.417 (N) GAS/AIR TURRET, TYPICAL. REFER TO PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION
- 22.452 (N) ACCESSIBLE EYE/FACE WASH EQUIPMENT W/RAILS, SEE DETAIL 17/AD-1.1
- 23.380 (N) EXISTING COMPLIANT FUME HOOD, CONTRACTOR TO COORDINATE WITH EXISTING HOOD CONNECTIONS, ELECTRICAL/MECHANICAL DRAWINGS, ETC

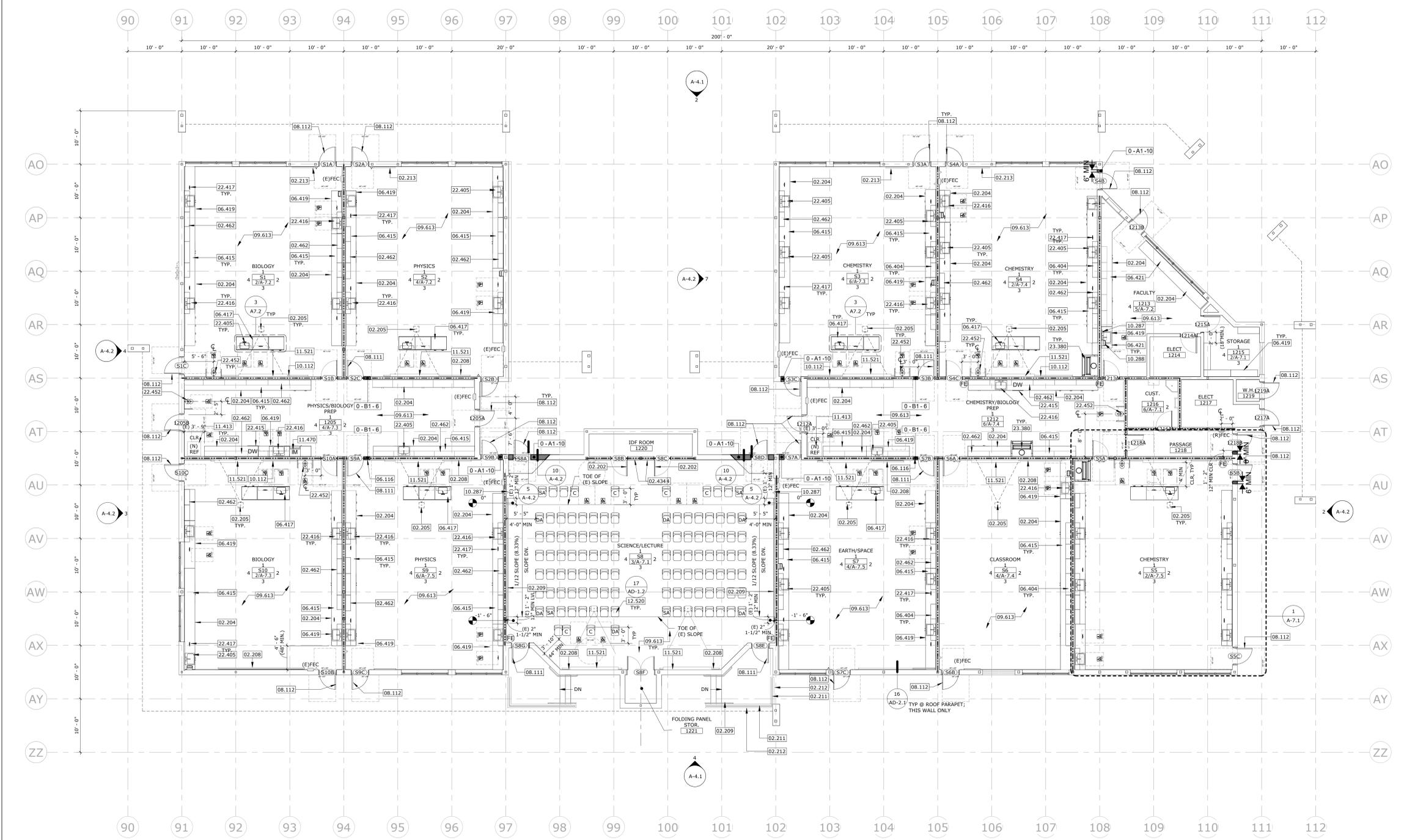
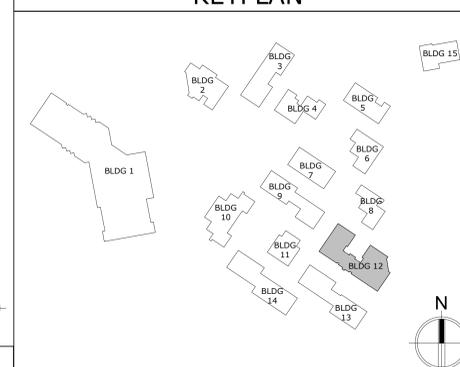
LEGEND

- WALL TAG**
- WALL TYPE, REFER TO AD-2.1
- WALL WIDTH
- FIRE RATING BY HOUR
- (E) 2x WOOD STUD WALL TO REMAIN
- (E) 2x WOOD STUD WALL TO REMAIN
- (E) DOOR TO REMAIN, U.N.O.
- (E) WINDOW TO REMAIN, U.N.O.
- (N) 2x WOOD STUDS @16" O.C., MATCH TO ADJACENT (E) WALL STUD SIZE AND INTERIOR/EXTERIOR FINISHES
- (N) DOOR, SEE DOOR SCHEDULE
- (E) FIRE EXTINGUISHER CABINET
- RELOCATED (E) FIRE EXTINGUISHER CABINET, SEE DETAIL 13/AD-1.1
- (E) SURFACE-MOUNTED FIRE EXTINGUISHER, RELOCATED TO ACCESSIBLE HEIGHT
- EXISTING 1-HOUR FIRE-RATED WALL TO REMAIN, PROTECT IN PLACE

GENERAL NOTES

- VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
- ALL DIMENSIONS ARE TO FACE OF STUD, CENTERLINE OF COLUMN OR EDGE OF SLAB, U.N.O.
- SEE DETAILS 2 & 3 FOR WALL TYPE INFORMATION.
- PROVIDE R-19 BATT INSULATION AT ALL EXTERIOR WALLS, U.N.O. GYPSUM BOARD AND INSULATION SHALL EXTEND FULL HEIGHT OF WALL TO UNDERSIDE OF ROOF STRUCTURE.
- PROVIDE STUD BRACING AND SUPPORT FOR ALL WALL MOUNTED FIXTURES AND ACCESSORIES. PER DETAIL 5/AD-1.2
- SEE SHEET AD-6.1 FOR DOOR AND WINDOW INFORMATION
- SET DOORS ADJACENT TO WALLS A MIN. OF 4" AWAY FROM WALL U.N.O.
- ADD LOCKING CAPABILITIES TO EXISTING UPPER CABINETRY

KEYPLAN



FLOOR PLAN - MOD. SCALE: 1/8" = 1'-0" 1

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**BUILDING 12
 FLOOR PLAN - MOD.**

A-1.1

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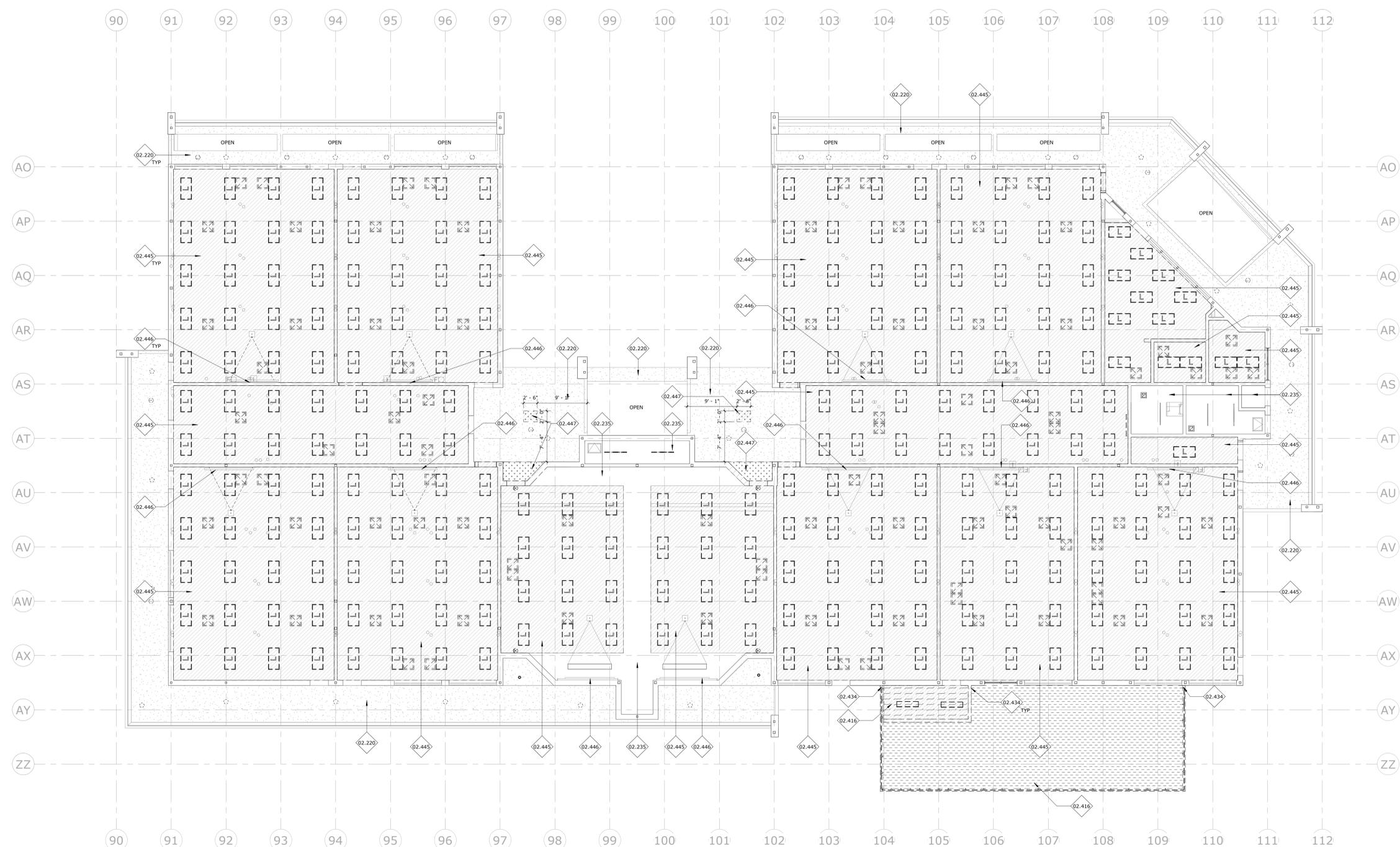
STAMPS
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 (P/N No. 34-94 404-119771)

KEYNOTES

- DEMOLITION KEYNOTE LEGEND**
- 02.220 (E) PLASTER SOFFIT TO REMAIN, PROTECT IN PLACE
 - 02.235 (E) GYPSUM CEILING TO REMAIN, PROTECT IN PLACE
 - 02.416 DEMOLISH (GREEN HOUSE) PORTION OF (E) BUILDING IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO LOW CONCRETE WALLS, CONCRETE PAVING, ETC. PATCH & REPAIR EXISTING LANDSCAPE AND HARDSCAPE.
 - 02.434 PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH. ANY RATED WALL SHALL BE REPAIRED TO KEEP EXISTING RATING FOR THAT WALL.
 - 02.445 REMOVE (E) LAY-IN PANELS, LIGHT FIXTURES, EXIT SIGNS, DIFFUSERS, REGISTERS AND EXHAUST. (E) CEILING GRID SYSTEM (MAIN & CROSS RUNNERS), ATTACHMENTS TO ROOF BRACING WIRES, FASTENERS, PROJECTORS, WIRELESS ACCESS POINT (WAP) AND FIRE ALARM SYSTEM DEVICES TO REMAIN, PROTECT IN PLACE. CEILING GRIDS TO BE CLEANED AND PAINTED TO MATCH EXISTING FINISH. COLOR TO BE APPROVED BY ADR. REFER TO CONSULTANT DRAWINGS FOR ADDITIONAL INFORMATION.
 - 02.446 REMOVE (E) WALL MOUNTED PROJECTOR SCREEN, BRACKETS, SUPPORTS, ETC. PREPARE SPACE FOR NEW PROJECTOR SCREEN. PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH.
 - 02.447 REMOVE (E) PLASTER SOFFIT

LEGEND

- EXISTING GYPSUM CEILING TO REMAIN, PROTECT IN PLACE
 - EXISTING PLASTER CEILING TO REMAIN, PROTECT IN PLACE
 - EXISTING PLASTER CEILING TO BE REMOVED AND REPLACED
 - DEMOLISH EXISTING 2'-0" x 4'-0" LAY-IN TILES, (E) SUSPENDED T-BAR CEILING GRID TO REMAIN, PROTECT IN PLACE
 - DEMOLISH EXISTING GREEN HOUSE GLASS CEILING/ROOF
 - DEMOLISH EXISTING GREEN HOUSE GYPSUM CEILING
 - 12" x 48" LIGHT FIXTURE TO BE DEMOLISHED
 - 24" x 48" LIGHT FIXTURE TO BE DEMOLISHED
 - 12" x 48" LIGHT FIXTURE TO BE DEMOLISHED
 - EXISTING LIGHTING FIXTURE TO BE REMOVED AND REPLACED. PATCH & REPAIR TO MATCH EXISTING FINISH
 - EXISTING CEILING MOUNTED EXIT SIGN TO BE REMOVED AND REPLACED
 - DEMOLISH EXISTING PLASTER FINISH AND PREPARE FOR NEW CEILING MOUNTED SPEAKER PER ELECTRICAL DRAWINGS. PATCH & REPAIR TO MATCH EXISTING FINISH
 - EXISTING MECHANICAL DIFFUSER, REGISTER & EXHAUST TO BE DEMOLISHED. REFER TO SHEET MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION
- NOTE: DEMOLISH EXISTING INSULATION ON THE UNDERSIDE OF THE ROOF. TYPICAL. PREPARE SPACE FOR NEW R-19 INSULATION.



KEYPLAN



REFLECTED CEILING PLAN - DEMO. SCALE: 1/8" = 1'-0" 1

PROJECT No. :1-30-50
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8756 MAST BOULEVARD, SANTEE, CA 92071
 GROSSMONT UNION HIGH SCHOOL DISTRICT

**BUILDING 12
 REFLECTED CEILING
 PLAN - DEMO.**

A-2.1

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 PIN No. 39-96 4504-119771

KEYNOTES

- NEW CONSTRUCTION PLAN KEYNOTE
- 02.205 (E) CEILING MOUNTED PROJECTOR PER A#04-109178 TO REMAIN, PROTECT IN PLACE
 - 02.220 (E) SUSPENDED PLASTER CEILING TO REMAIN, PROTECT IN PLACE
 - 09.211 NEW GYPSUM BOARD ASSEMBLY, SEE DETAIL 20/AD-4.1
 - 09.290 (E) GYPSUM BOARD
 - 09.530 NEW 2'-0" x 4'-0" ACOUSTICAL CEILING LAY-IN TILES ON (E) SUSPENDED T-BAR CEILING GRID ASSEMBLY
 - 11.521 (N) 16:9 PROJECTION SCREEN
 - 23.371 DIFFUSER
 - 23.373 GRILLE
 - 26.510 INTERIOR LIGHTING
 - 26.560 EXTERIOR LIGHTING

LEGEND

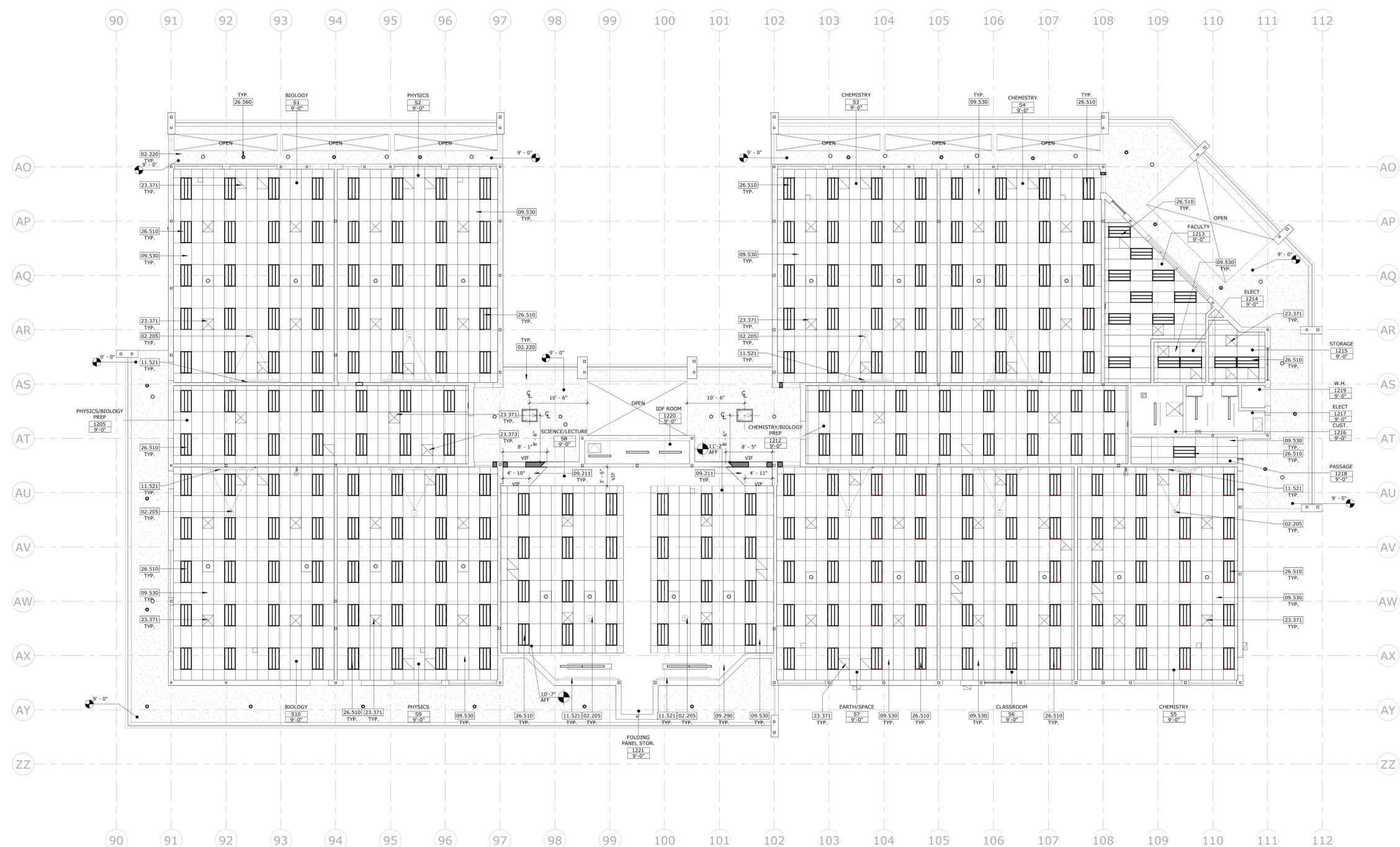
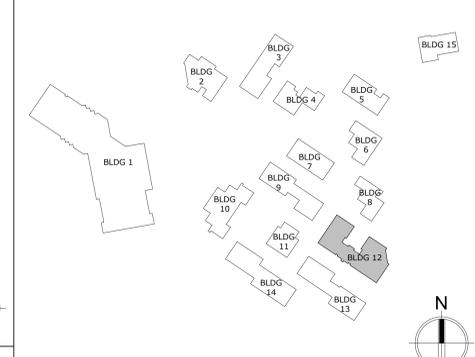
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| | EXISTING GYPSUM CEILING TO REMAIN, PROTECT IN PLACE | | NEW 24" x 48" LIGHT FIXTURE REFER TO ELECTRICAL PLANS |
| | EXISTING SUSPENDED PLASTER CEILING TO REMAIN, PROTECT IN PLACE | | LED STRIP LIGHT, REFER TO ELECTRICAL AD-4.1 |
| | NEW 2'-0" x 4'-0" LAY-IN TILES ON (E) SUSPENDED T-BAR CEILING GRID | | RECESSED LIGHT FIXTURE, REFER TO ELECTRICAL AD-4.1 |
| | NEW GYPSUM BOARD 5/8" THICK, FINISH SCHED & DET AD-4.1 | | RECESSED SPEAKER, REFER TO ELECTRICAL AD-4.1 SIM |
| | (E) PROJECTOR W/NEW PROJECTOR SCREEN | | CEILING MOUNTED OR WALL MOUNTED EXIT SIGN, REFER TO ELECTRICAL DRAWINGS FOR ADD'L INFORMATION |
| | (E) ACCESS CEILING PANEL TO REMAIN, PROTECT IN PLACE | | 24"X30" CEILING ACCESS PANEL PER DETAIL AD-4.1 |

NOTE:
 FOR COLOR, MATERIAL AND FINISHES (CMP)- SEE SHEET ID-1.0

GENERAL NOTES

- ALL LIGHT FIXTURES TO BE CENTERED IN SPACE, U.N.O.
- ALL CEILING HEIGHTS ARE RELATIVE TO THE FINISH FLOOR DIRECTLY BENEATH
- ACOUSTICAL CEILING TILES AND GRID TO BE CENTERED IN ROOM. SEE SHEET 6 AD-4.1 FOR SUSPENDED CEILING SEISMIC BRACING DETAILS AND TRAPEZE DETAILS
- ALL EXPOSED STRUCTURE, INCLUDING MECHANICAL & PLUMBING EQUIPMENT TO BE PAINTED
- ALL MECHANICAL, ELECTRICAL AND PLUMBING EQUIPMENT TO BE HELD AS TIGHT AS POSSIBLE TO CEILING STRUCTURE
- ALL CONDUIT IN EXPOSED AREAS WHERE CEILING STRUCTURE IS EXPOSED CAN ONLY PENETRATE WALLS AT ROOF / FLOOR DECK
- REFER TO ELECTRICAL & MECHANICAL DRAWINGS FOR CEILING COMPONENT CALLOUTS AND FIXTURE TYPES
- PAINT ALL SUPPLY & RETURNS OF ALL ACCENT PAINTED CEILING AREAS
- SEE SHEET AD-4.1 FOR CEILING DETAILS
- PROVIDE A MIN. R-19 BELOW ROOF STRUCTURE

KEYPLAN



REFLECTED CEILING PLAN - MOD. SCALE: 1/8" = 1'-0" 1

PROJECT No. :1-30-50
 2/24/2021 3:30:03 PM

ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION

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3775 TENTH STREET, REVERDE CALIFORNIA 92083(951) 684-6664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92008(619) 438-5899

SCIENCE BLDG. MODERNIZATION

8756 MAST BOULEVARD, SANTEE, CA 92071
 GROSSMONT UNION HIGH SCHOOL DISTRICT

**BUILDING 12
 REFLECTED CEILING
 PLAN - MOD.**

A-2.2

SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 12-29-2020



IDENTIFICATION STAMP
 DIV. OF THE STATE ARCHITECT
 APP: 04-119771 INC.
 REVIEWED FOR
 SS FLS ACS
 DATE: 03/11/2021

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 ARCHITECTS**

CONSULTANT BRANDING

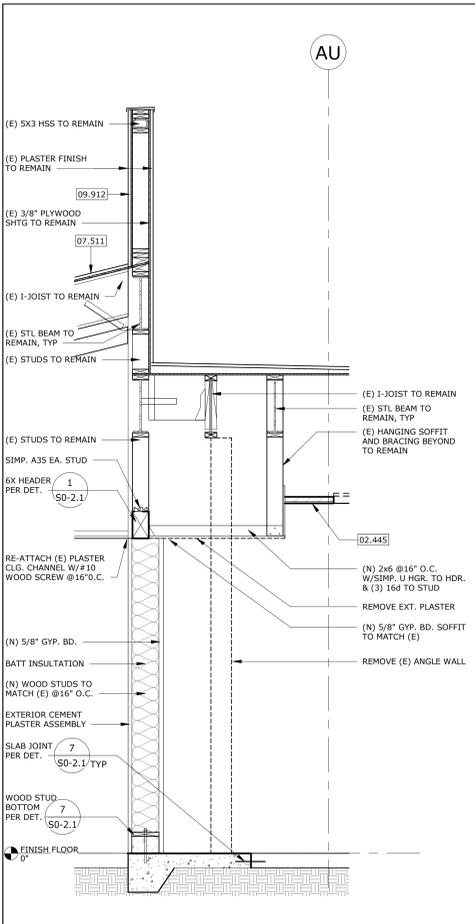
KEYNOTES

DEMOLITION KEYNOTE LEGEND

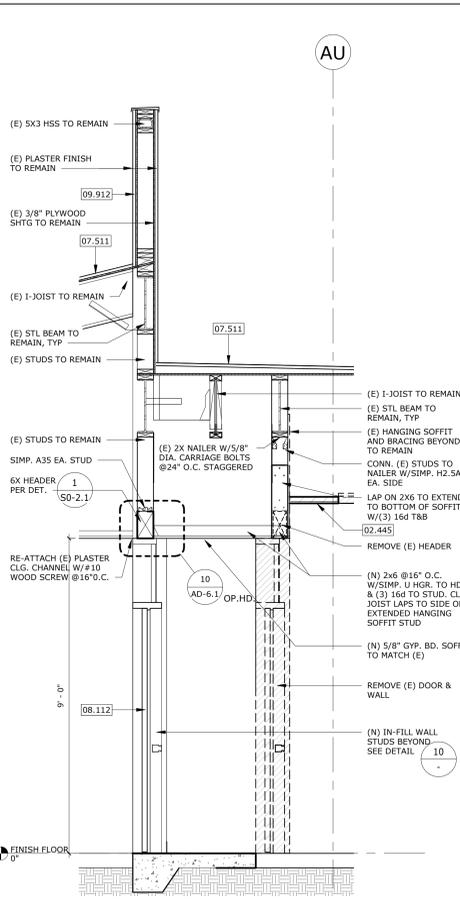
02.203 (E) WINDOW TO REMAIN, PROTECT IN PLACE
 02.220 (E) PLASTER SOFFIT TO REMAIN, PROTECT IN PLACE
 02.221 (E) 2x WOOD CEILING JOISTS TO REMAIN, PROTECT IN PLACE
 02.236 (E) EXTERIOR CEMENT PLASTER FINISH TO REMAIN, PROTECT IN PLACE
 02.416 DEMOLISH (GREEN HOUSE) PORTION OF (E) BUILDING IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO LOW CONCRETE WALLS, CONCRETE PAVING, ETC. PATCH & REPAIR EXISTING LANDSCAPE AND HARDSCAPE
 02.426 REMOVE (E) DOOR/FRAME/GLAZING TRANSOM
 02.444 REMOVE (E) DOOR/FRAME
 02.445 REMOVE (E) LAY-IN PANELS, LIGHT FIXTURES, EXIT SIGNS, DIFFUSERS, REGISTERS AND EXHAUST (E) CEILING GRID SYSTEM (MAIN & CROSS RUNNERS), ATTACHMENTS TO ROOF, BRACING WIRES, FASTENERS, PROTECTORS, WIRELESS ACCESS POINT (WAP) AND FIRE ALARM SYSTEM DEVICES TO REMAIN, PROTECT IN PLACE. CEILING GRIDS TO BE CLEANED AND PAINTED TO MATCH EXISTING FINISH. COLOR TO BE APPROVED BY AOR. REFER TO CONSULTANT DRAWINGS FOR ADDITIONAL INFORMATION
 02.448 PATCH/REPAIR/PAINT (E) EXTERIOR PLASTER WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH
 02.449 ALTERNATIVE OPTION - REMOVE AND REPLACE (E) EXTERIOR WALL PLASTER FINISH. PREPARE AREA FOR NEW PLASTER FINISH
 02.451 REMOVE AND REPLACE LOWER DAMAGED PORTION OF (E) WALL. PATCH/REPAIR/PAINT (E) EXTERIOR CEMENT PLASTER WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH

NEW CONSTRUCTION KEYNOTE

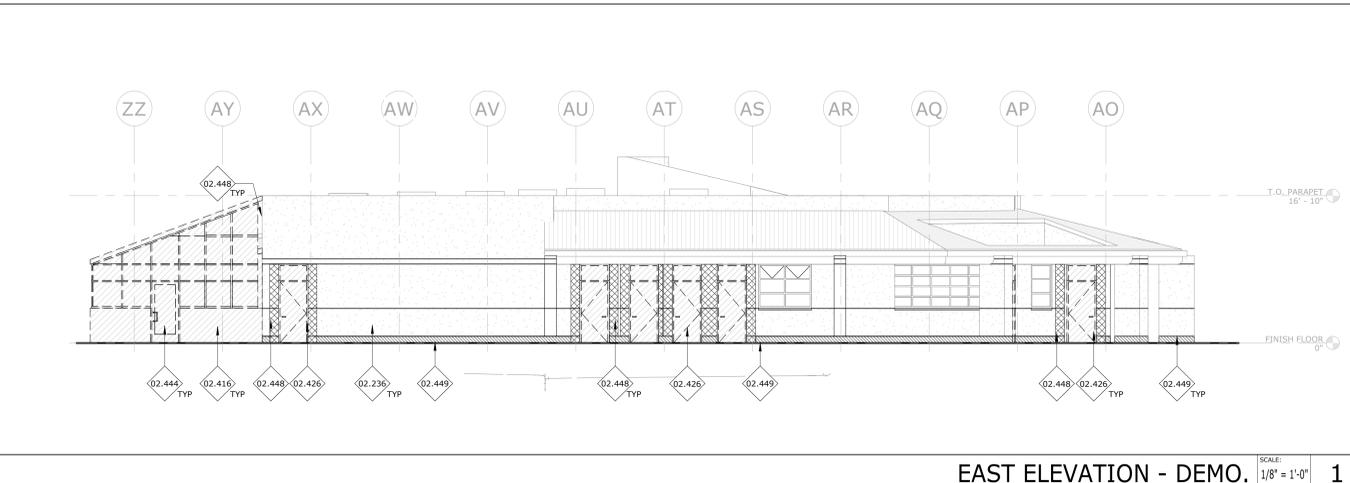
06.111 (N) WOOD STUD FRAMING TO MATCH (E) ADJACENT STUD AND FINISHES. SEE LEGEND.
 07.219 (N) BATT INSULATION
 07.511 (E) ROOF TO REMAIN
 08.112 (N) DOOR, FRAME AND TRANSOM GLAZING, SEE DOOR SCHEDULE
 09.225 PLASTER REVEAL JOINT
 09.240 NEW EXTERIOR PORTLAND CEMENT PLASTER
 09.912 PAINT (E) WALL PER FINISH SCHEDULE
 10.143 ROOM IDENTIFICATION SIGNAGE



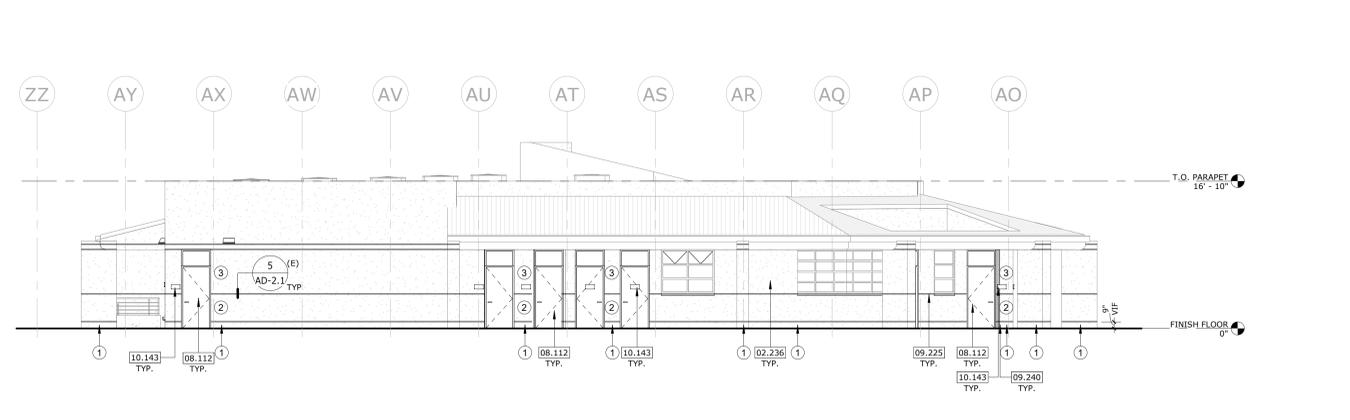
WALL SECTION - B SCALE: 1/2" = 1'-0" **10**



WALL SECTION - A SCALE: 1/2" = 1'-0" **5**



EAST ELEVATION - DEMO. SCALE: 1/8" = 1'-0" **1**



EAST ELEVATION - MOD. SCALE: 1/8" = 1'-0" **2**

GENERAL NOTES

1. SEE DETAIL 5 (AD-2.1) FOR TYPICAL EXTERIOR PLASTER REVEAL.
 2. SEE DETAIL 6 (AD-2.1) FOR TYPICAL EXTERIOR PLASTER CORNER.

LEGEND

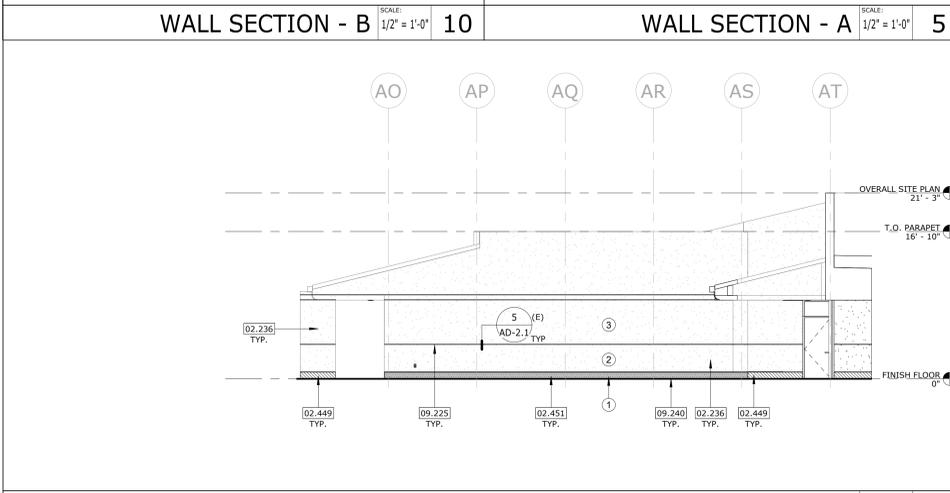
DEMOLISH

EXISTING EXTERIOR CEMENT PLASTER TO REMAIN
 PATCH/REPAIR/PAINT (E) EXTERIOR CEMENT PLASTER WALLS

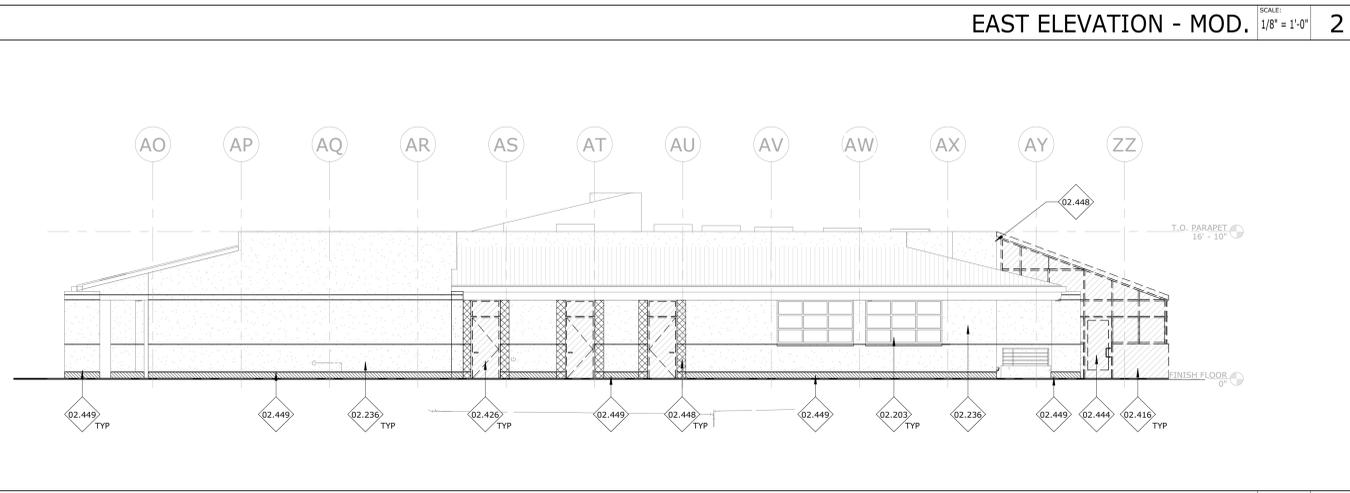
MODERNIZATION

EXTERIOR CEMENT PLASTER
 CPL-1 CPL-2 CPL-3
 1 2 3

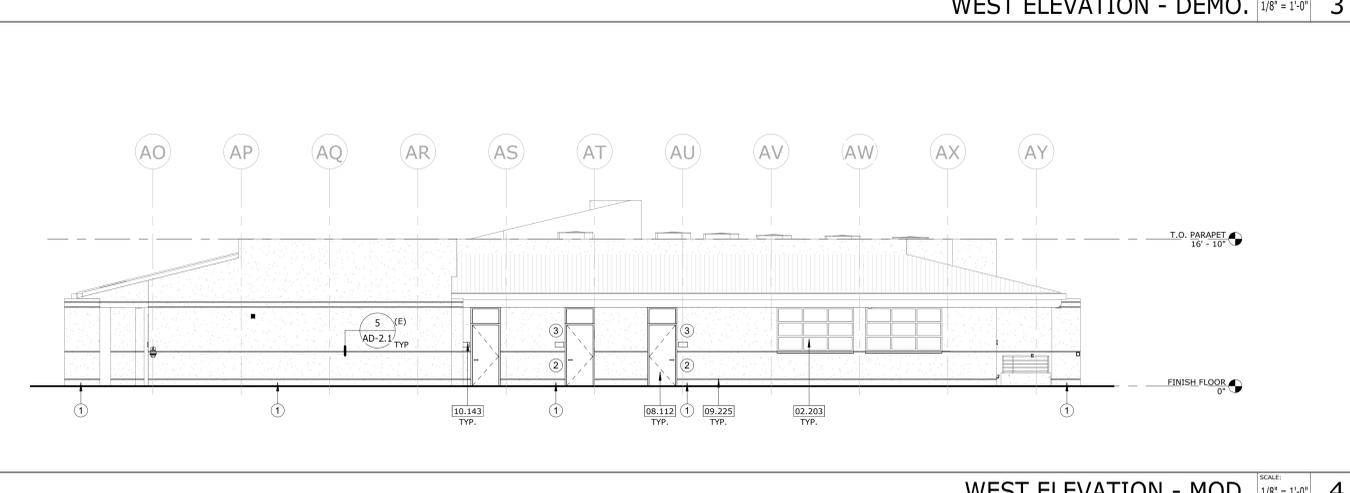
NOTE:
 SEE COLOR, MATERIAL AND FINISHES LEGEND (CMP) ON SHEET 10-1.0 FOR ADDITIONAL INFORMATION



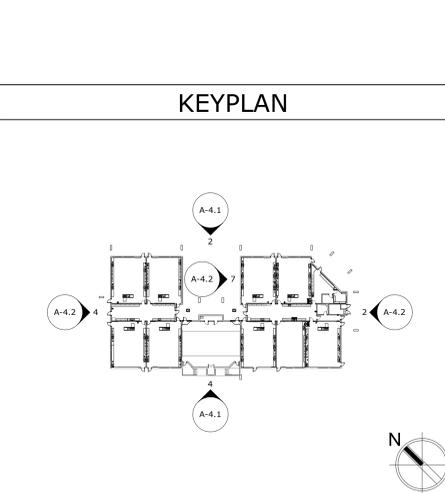
ELEVATION - A SCALE: 1/8" = 1'-0" **7**



WEST ELEVATION - DEMO. SCALE: 1/8" = 1'-0" **3**



WEST ELEVATION - MOD. SCALE: 1/8" = 1'-0" **4**



PROJECT No. :1-30-50
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SCIENCE BLDG. MODERNIZATION

**BUILDING 12
 EXTERIOR ELEVATIONS**

A-4.2

SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 11-29-2020



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KEYNOTES

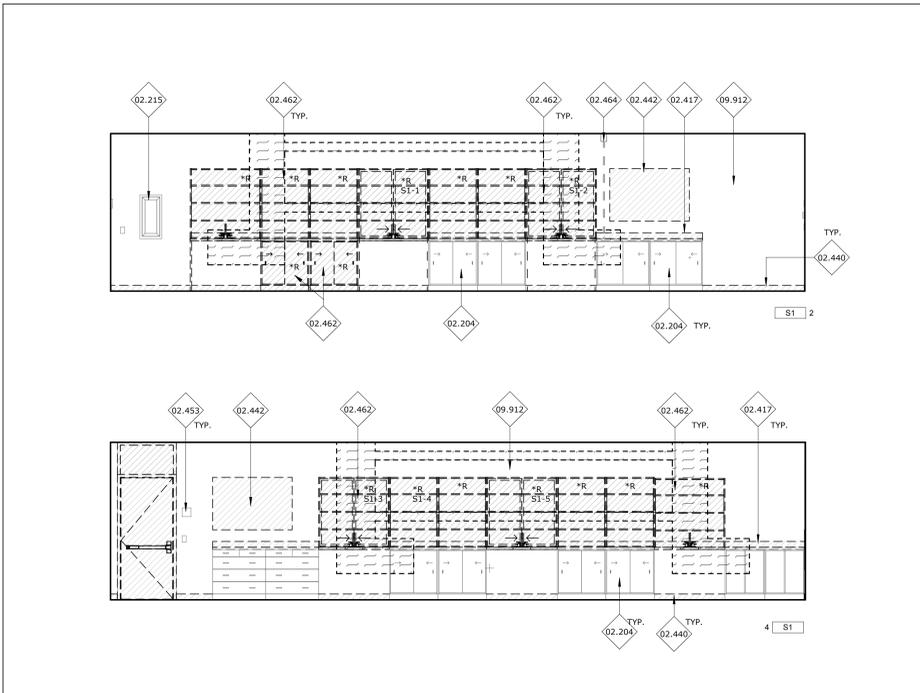
- DEMOLITION KEYNOTE LEGEND**
- 02.201 (E) WALL TO REMAIN, PROTECT IN PLACE
 - 02.203 (E) WINDOW TO REMAIN, PROTECT IN PLACE
 - 02.204 (E) CASEWORK TO REMAIN, PROTECT IN PLACE
 - 02.208 (E) MARKERBOARD TO REMAIN, PROTECT IN PLACE
 - 02.213 (E) TACK BOARD TO REMAIN, PROTECT IN PLACE
 - 02.215 (E) FIRE EXTINGUISHER CABINET TO REMAIN, PROTECT IN PLACE
 - 02.219 (E) SPEAKER/HORN STROBE PER A404-109178 TO REMAIN, PROTECT IN PLACE
 - 02.417 REMOVE AND REPLACE (E) BOXY COUNTER TOP AND BACK SPLASH. REFURBISH (E) BASE CABINETS TO LIKE NEW CONDITION. TYPICAL. PATCH/REPAIR WALL AS REQUIRED BEFORE INSTALLATION OF NEW COUNTER TOP AND BACKSPLASH.
 - 02.430 REMOVE (E) CASEWORK. PATCH/REPAIR/PAIN (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH.
 - 02.437 REMOVE AND REPLACE (E) FRP WALL FINISH. PATCH/REPAIR WALL PRIOR TO PLACING NEW FRP WALL FINISH.
 - 02.439 RELOCATE ITEM TO ACCESSIBLE HEIGHT. PATCH/REPAIR/PAIN WALL PRIOR TO PLACING ITEM IN NEW HEIGHT LOCATION. MATCH (E) ADJACENT WALL MATERIAL AND FINISH.
 - 02.440 REMOVE AND REPLACE (E) WALL BASE. SEE SHEET A1-1.1 DEMO FLR. PLAN GENERAL.
 - 02.442 NOTE#1 FOR ADDITIONAL INFORMATION.
 - 02.452 REMOVE (E) TACKABLE WALL PANEL. PATCH/REPAIR/PAIN (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH.
 - 02.453 REMOVE AND REPLACE (E) COUNTER TOP, SINK, FAUCET, BASE CABINET, TYPICAL. PATCH/REPAIR/PAIN (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH. SEE PLUMBING & ELECTRICAL DWG. FOR MORE INFO.
 - 02.454 REMOVE AND REPLACE (E) SIGN, TYPICAL. PATCH/REPAIR/PAIN (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH. SEE SHEET G-2 FOR NEW SIGNAGE PLANS.
 - 02.462 REMOVE AND REPLACE (E) PLASTIC LAMINATE COUNTER TOP AND BACK SPLASH. REFURBISH (E) BASE CABINETS TO LIKE NEW CONDITION. TYPICAL. PATCH/REPAIR WALL AS REQUIRED BEFORE INSTALLATION OF NEW COUNTER TOP AND BACKSPLASH.
 - 02.464 RELOCATE (E) CASEWORK. REPAIR/REFINISH AS REQUIRED. (E) UPPER CABINETS TO BE REINSTALLED PER DEMO GENERAL NOTE #6.
 - 06.404 RELOCATE ALL SURFACE MOUNTED ELECTRICAL AND DATA CONDUITS WITHIN WALL. TYPICAL THROUGH OUT PROJECT. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION AND LOCATIONS OF THESE ITEMS.
 - 06.415 NEW CONSTRUCTION KEYNOTE
 - 06.404 RELOCATED UPPER CASEWORK, PROVIDE NEW BLOCKING AS NEEDED, TYPICAL. SEE DETAIL 13/AD-1.2
 - 06.415 (N) EPOXY COUNTERTOP WITH 4" BACKSPLASH
 - 06.416 (N) COUNTERTOP
 - 06.420 (N) CONTINUOUS COUNTERTOP
 - 06.421 (N) PLASTIC LAMINATE COUNTERTOP WITH 4" BACKSPLASH
 - 06.801 GLASS FIBER REINFORCED PLASTIC (FRP) PANEL
 - 08.140 WOOD DOOR
 - 09.651 (N) RESILIENT BASE PER FINISH SCHEDULE.
 - 09.912 PAINT (E) WALL PER FINISH SCHEDULE
 - 10.114 TACKABLE WALL PANEL SYSTEM
 - 10.143 ROOM IDENTIFICATION SIGNAGE
 - 10.145 EXIT SIGNAGE
 - 10.287 RELOCATED SOAP/SANITIZER DISPENSER
 - 10.288 PAPER TOWEL DISPENSER
 - 10.295 HAND SANITIZER DISPENSER
 - 11.521 (N) 16:9 PROJECTION SCREEN
 - 22.405 (N) SINK/FAUCET PER PLUMBING DWG.
 - 22.416 (N) ACCESSIBLE SINK/FAUCET PER PLUMBING DWG.
 - 22.417 (N) GAS/AIR TURRET, TYPICAL. REFER TO PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
 - 22.452 (N) ACCESSIBLE EYE/FACE WASH EQUIPMENT WRALLS, SEE DETAIL 17/AD-1.1

GENERAL NOTES

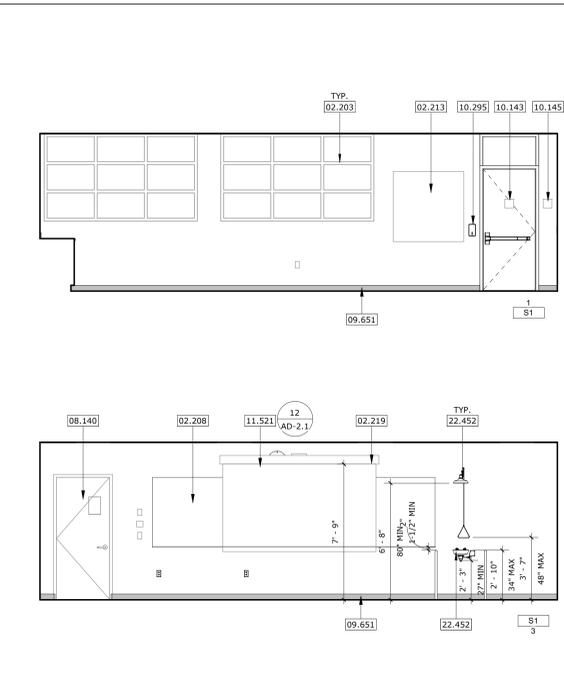
1. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
 2. ALL DIMENSIONS ARE TO FACE OF STUD, CENTERLINE OF COLUMN OR EDGE OF SLAB, U.N.O.
 3. PROVIDE STUD BRACING AND SUPPORT FOR ALL WALL MOUNTED FIXTURES AND ACCESSORIES.
- PER DETAIL 5/AD-1.2

LEGEND

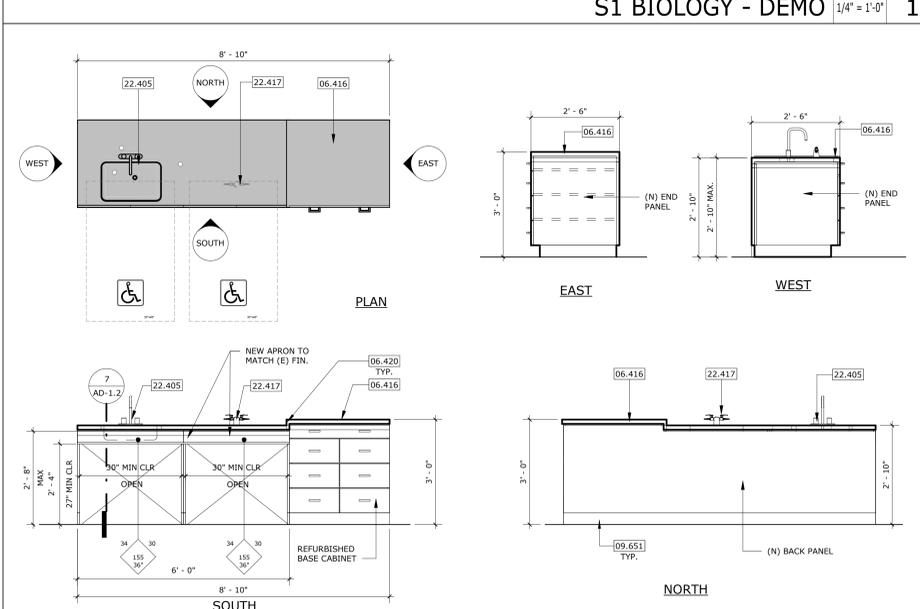
- TWP-1 TACKABLE WALL PANEL
 - RELOCATE/RELOCATED CASEWORK FROM/TO LOCATION
 - DEMOLISH (E) GYPSUMBOARD AND REPLACE IN KIND
- NOTE:**
 SEE COLOR, MATERIAL AND FINISHES LEGEND (CMP) ON SHEET ID-1.0 FOR ADDITIONAL INFORMATION



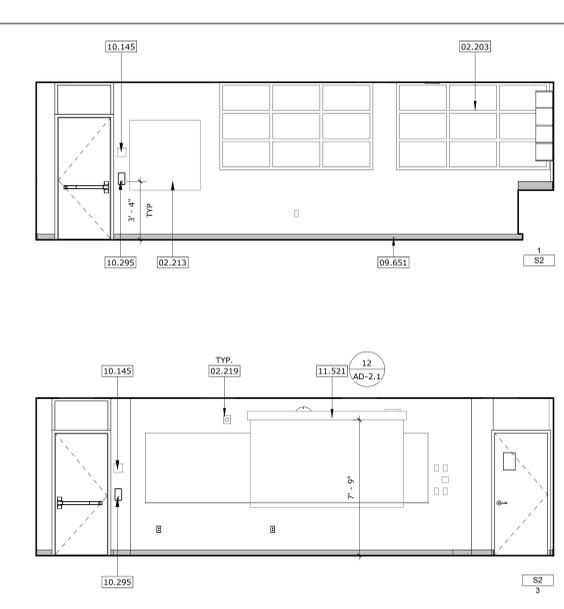
S1 BIOLOGY - DEMO SCALE: 1/4" = 1'-0" 1



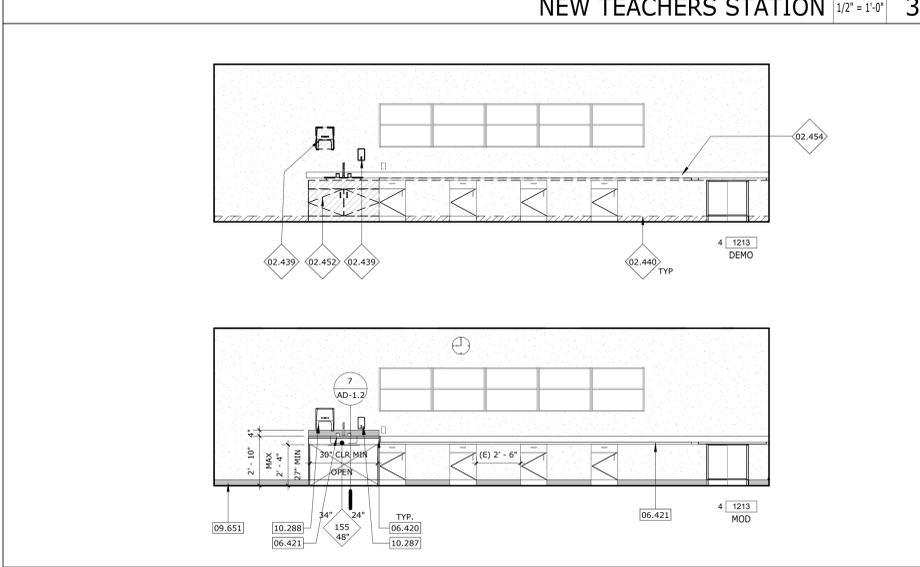
S1 BIOLOGY - MOD. SCALE: 1/4" = 1'-0" 2



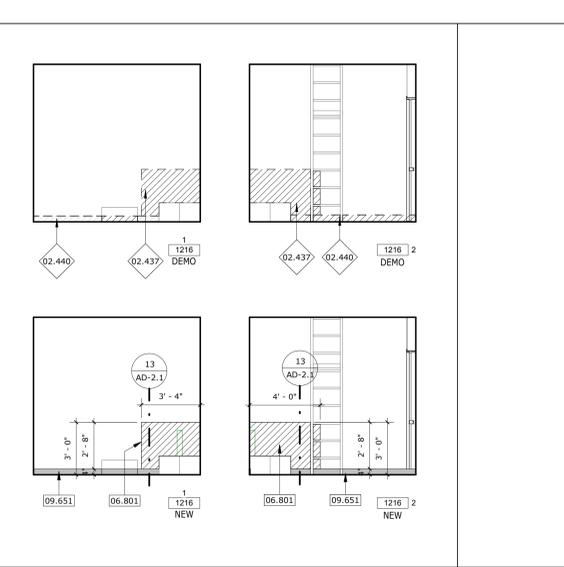
NEW TEACHERS STATION SCALE: 1/2" = 1'-0" 3



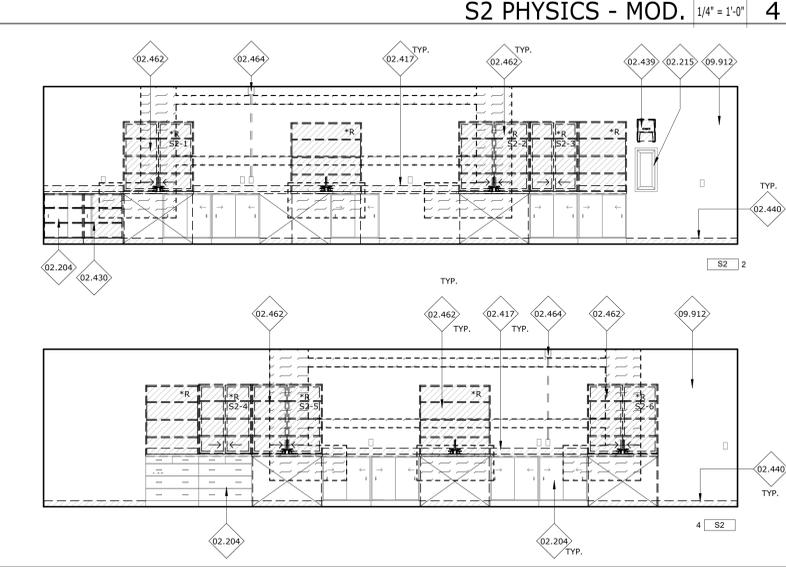
S2 PHYSICS - MOD. SCALE: 1/4" = 1'-0" 4



1213 OFFICE - DEMO/MOD. ELEVATIONS SCALE: 1/4" = 1'-0" 5



1216 - CUSTODIAN DEMO/NEW SCALE: 1/4" = 1'-0" 6



S2 PHYSICS - DEMO SCALE: 1/4" = 1'-0" 7

PROJECT No. 11-30-50
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ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION

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SCIENCE BLDG. MODERNIZATION

**BUILDING 12
 INTERIOR ELEVATIONS**

A-7.2

3775 TENTH STREET, AUBERNE CALIFORNIA 92506(951) 684-6664 / 5753 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92008(760) 438-3899
 8756 MAST BOULEVARD, SANTEE, CA 92071
 GROSSMONT UNION HIGH SCHOOL DISTRICT

SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 11-29-2020



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DIV. OF THE STATE ARCHITECT
APP: 04-119771 INC.
REVIEWED FOR
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DATE: 03/11/2021

AGENCY APPROVAL
FIG. NO. 30-PM - 0304-119771

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STAMPS

CONSULTANT BRANDING

KEYNOTES

DEMOLITION KEYNOTE LEGEND

- 02.202 (E) DOOR TO REMAIN, PROTECT IN PLACE
 - 02.203 (E) WINDOW TO REMAIN, PROTECT IN PLACE
 - 02.204 (E) CASEWORK TO REMAIN, PROTECT IN PLACE
 - 02.206 (E) FUME HOOD TO BE REMOVED AND REPLACED WITH NEW ACCESSIBLE COMPLIANT FUME HOOD IN EXISTING LOCATION, CONTRACTOR TO COORDINATE WITH EXISTING HOOD CONNECTIONS, ELECTRICAL/MECHANICAL DRAWINGS, ETC.
 - 02.208 (E) MARKERBOARD TO REMAIN, PROTECT IN PLACE
 - 02.213 (E) TACK BOARD TO REMAIN, PROTECT IN PLACE
 - 02.215 (E) FIRE EXTINGUISHER CABINET TO REMAIN, PROTECT IN PLACE
 - 02.219 (E) SPEAKER/HORN STROBE PER A904-109178 TO REMAIN, PROTECT IN PLACE
 - 02.417 REMOVE AND REPLACE (E) EPOXY COUNTER TOP AND BACK SPLASH. REFINISH (E) BASE CABINETS TO LIKE NEW CONDITION. TYPICAL. PATCH/REPAIR WALL AS REQUIRED BEFORE INSTALLATION OF NEW COUNTER TOP AND BACKSPLASH.
 - 02.420 REMOVE AND REPLACE (E) SINK
 - 02.421 REMOVE AND REPLACE (E) DISH WASHER
 - 02.422 REMOVE AND REPLACE (E) EYEWASH W/NEW ADA COMPLIANT EYE WASH
 - 02.426 REMOVE (E) DOOR/FRAME/GLAZING TRANSOM
 - 02.430 REMOVE (E) CASEWORK, PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH.
 - 02.432 REMOVE (E) POSITION OF WALL
 - 02.433 REMOVE AND REPLACE (E) REFRIGERATOR
 - 02.436 REMOVE ALL (E) SHELVING, PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH.
 - 02.440 REMOVE AND REPLACE (E) WALL BASE. SEE SHEET A1-1.1 DEMO FLR. PLAN GENERAL NOTE#1 FOR ADDITIONAL INFORMATION.
 - 02.453 REMOVE AND REPLACE (E) SIGN, TYPICAL. PATCH/REPAIR/PAINT (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH. SEE SHEET G-2 FOR NEW SIGNAGE PLANS
 - 02.462 RELOCATE (E) CASEWORK, REPAIR/REFINISH AS REQUIRED. (E) UPPER CABINETES TO BE REINSTALLED PER DEMO GENERAL NOTE #6
 - 02.464 RELOCATE ALL SURFACE MOUNTED ELECTRICAL AND DATA CONDUITS WITHIN WALL, TYPICAL THROUGH OUT PROJECT. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION AND LOCATIONS OF THESE ITEMS.
 - 02.465 RELOCATE ITEM, PATCH/REPAIR/PAINT WALL PRIOR TO PLACING ITEM IN NEW HEIGHT LOCATION. MATCH (E) ADJACENT WALL MATERIAL AND FINISH.
- NEW CONSTRUCTION KEYNOTE
- 06.414 PLASTIC LAMINATE END FILLER PANEL, MATCH EXISTING CASEWORK FINISH, TYP
 - 06.415 (N) EPOXY COUNTERTOP WITH 4" BACKSPLASH
 - 06.420 (N) CONTINUOUS COUNTERTOP
 - 06.422 (N) COUNTERTOP BRACKET, SEE DETAIL 3/AD-1.2 FOR ADDITIONAL INFORMATION
 - 08.111 (N) DOOR PER SCHEDULE.
 - 08.112 (N) DOOR, FRAME AND TRANSOM GLAZING, SEE DOOR SCHEDULE
 - 08.140 WOOD DOOR
 - 09.651 (N) RESILIENT BASE PER FINISH SCHEDULE.
 - 09.912 PAINT (E) WALL PER FINISH SCHEDULE
 - 10.114 TACKABLE WALL PANEL SYSTEM
 - 10.145 EXIT SIGNAGE
 - 11.413 (N) REFRIGERATOR, CFC1, MODEL#FBG30RPGA BY FISCHER SCIENTIFIC
 - 11.521 (N) 16:9 PROJECTION SCREEN
 - 22.405 (N) SINK/FAUCET PER PLUMBING DWG.
 - 22.415 (N) GLASS WASHER, CFC1, MODEL#AD010000 BY LARCONCO
 - 22.416 (N) ACCESSIBLE SINK W/FAUCET PER PLUMBING DWG.
 - 22.417 (N) GAS/AIR TURRET, TYPICAL. REFER TO PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION
 - 22.452 (N) ACCESSIBLE FACE WASH EQUIPMENT W/RAILS, SEE DETAIL 17/AD-1.1
 - 23.380 (N) ACCESSIBLE COMPLIANT FUME HOOD, CONTRACTOR TO COORDINATE WITH EXISTING HOOD CONNECTIONS, ELECTRICAL/MECHANICAL DRAWINGS, ETC.

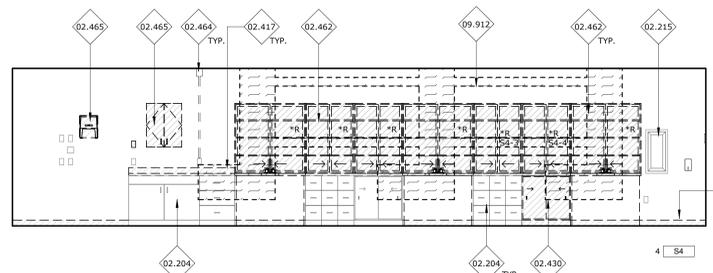
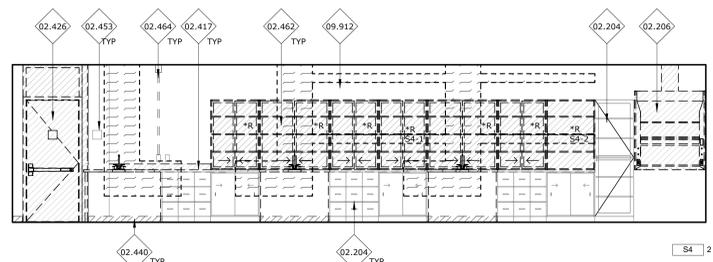
GENERAL NOTES

1. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
 2. ALL DIMENSIONS ARE TO FACE OF STUD, CENTERLINE OF COLUMN OR EDGE OF SLAB, U.N.O.
 3. PROVIDE STUD BRACING AND SUPPORT FOR ALL WALL MOUNTED FIXTURES AND ACCESSORIES.
- PER DETAIL 5 / AD-1.2

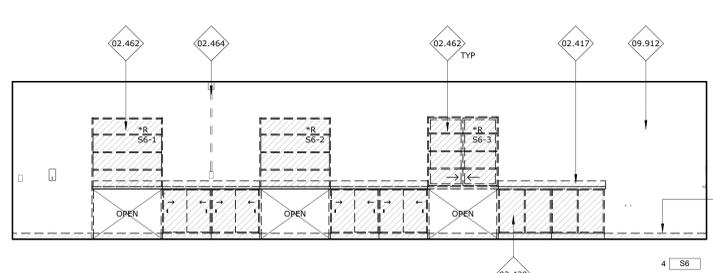
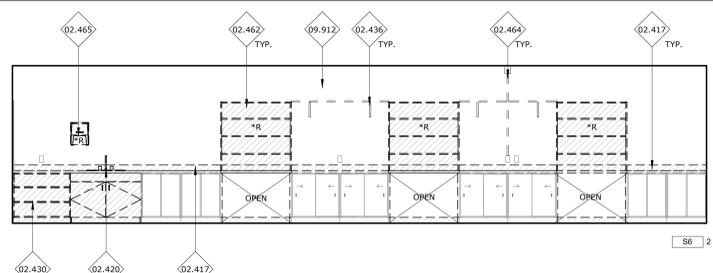
LEGEND

- TWP-1 TACKABLE WALL PANEL
- *R - RELOCATE/RELOCATED CASEWORK FROM/TO LOCATION
- DEMOLISH (E) GYPSUMBOARD AND REPLACE IN KIND

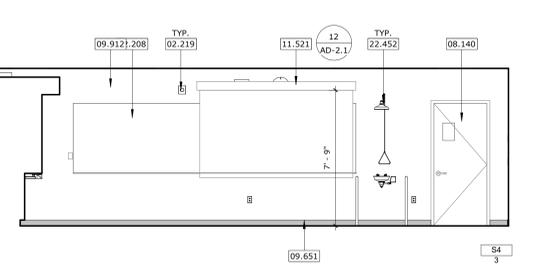
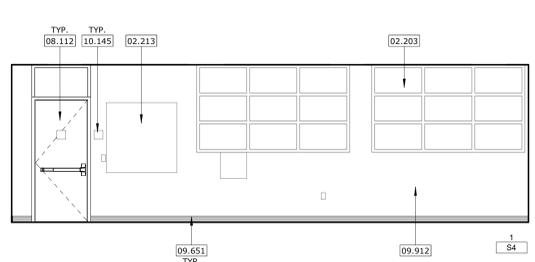
NOTE:
SEE COLOR, MATERIAL AND FINISHES LEGEND (CMP) ON SHEET 1D-1.0 FOR ADDITIONAL INFORMATION



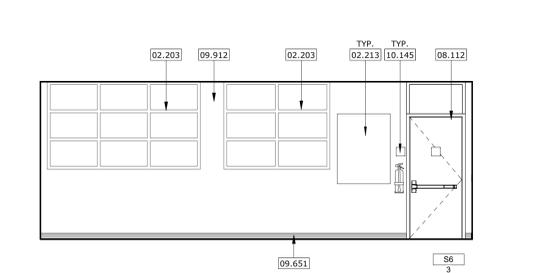
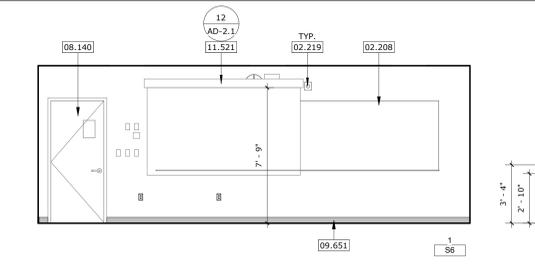
S4 CHEMISTRY - DEMO SCALE: 1/4" = 1'-0" 1



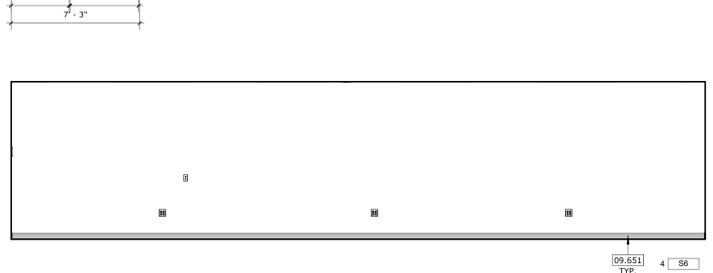
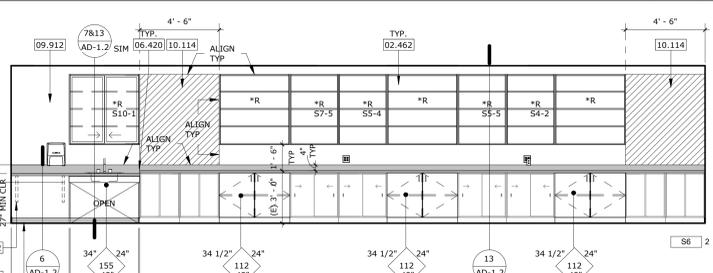
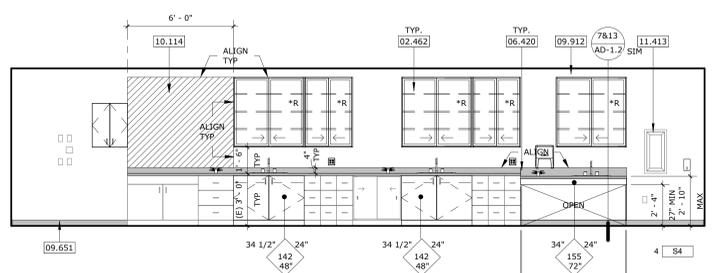
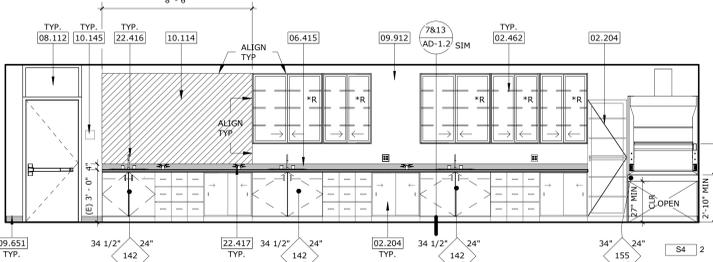
S6 HORTICULTURE - DEMO SCALE: 1/4" = 1'-0" 3



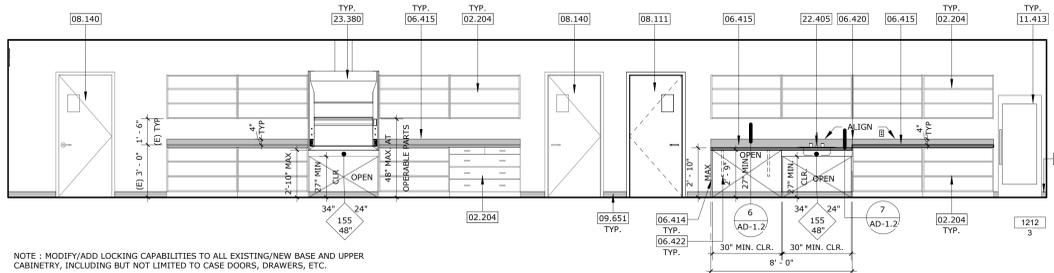
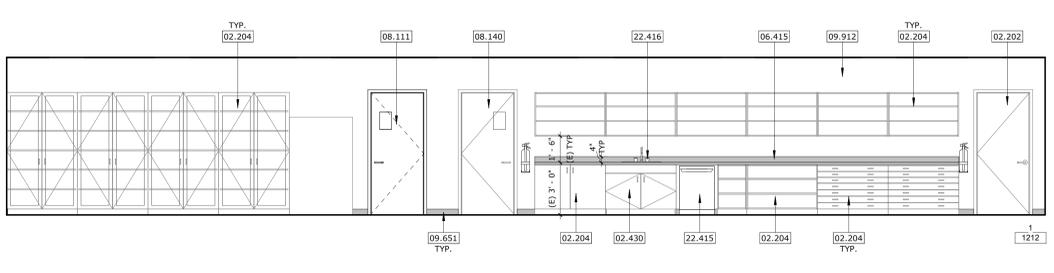
S4 CHEMISTRY - MOD. SCALE: 1/4" = 1'-0" 2



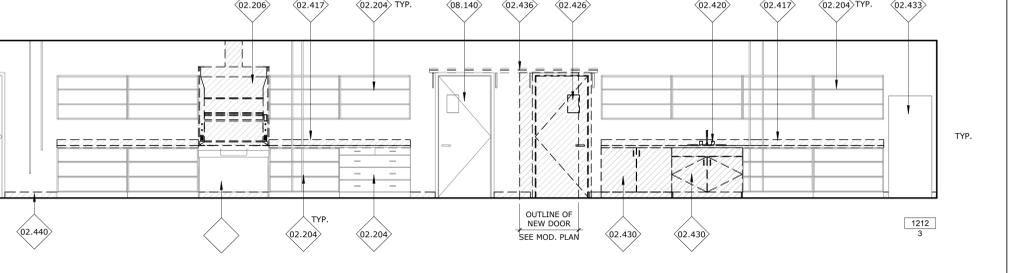
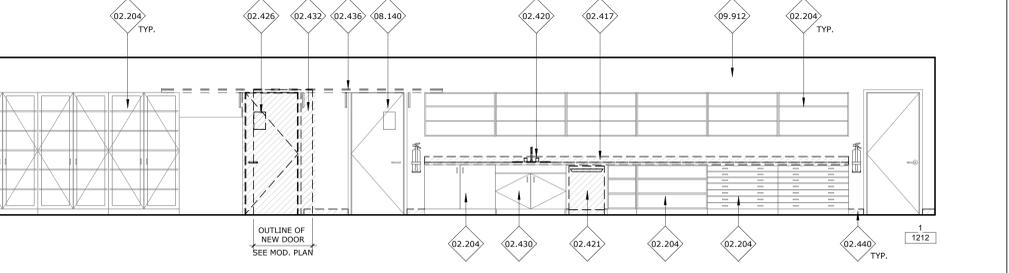
S6 CLASSROOM - MOD. SCALE: 1/4" = 1'-0" 4



1212- CHEMISTRY/ BIOLOGY - MOD. SCALE: 1/4" = 1'-0" 6



NOTE: MODIFY/ADD LOCKING CAPABILITIES TO ALL EXISTING/NEW BASE AND UPPER CABINETRY, INCLUDING BUT NOT LIMITED TO CASE DOORS, DRAWERS, ETC.



1212- CHEMISTRY/ BIOLOGY - DEMO. SCALE: 1/4" = 1'-0" 5

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SCIENCE BLDG. MODERNIZATION

**BUILDING 12
INTERIOR ELEVATIONS**

A-7.4

3775 TENTH STREET, RIVERSIDE CALIFORNIA 92503-9511 951-684-4664 / 5753 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92008-3100 619-589-9999

8756 MAST BOULEVARD, SANTEE, CA 92071
GROSSMONT UNION HIGH SCHOOL DISTRICT

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IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 04-119771 INC.
REVIEWED FOR:
SS FLS ACS
DATE: 03/11/2021

**RUHNAU
CLARKE
ARCHITECTS**

STAMPS
CONSULTANT BRANDING

KEYNOTES

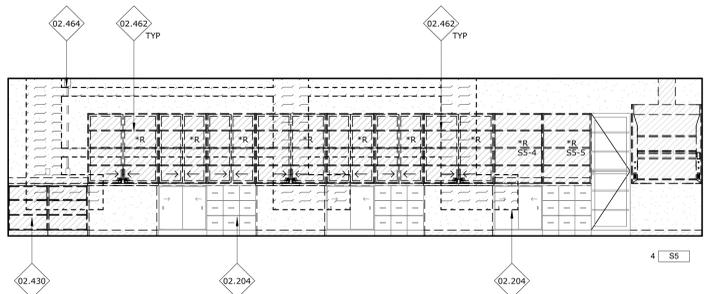
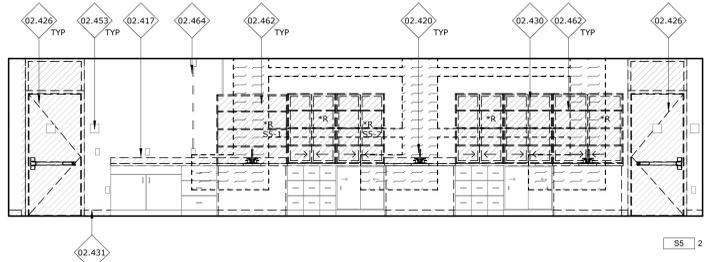
- DEMOLITION KEYNOTE LEGEND**
- 02.203 (E) WINDOW TO REMAIN, PROTECT IN PLACE
 - 02.204 (E) CASEWORK TO REMAIN, PROTECT IN PLACE
 - 02.208 (E) TACK BOARD TO REMAIN, PROTECT IN PLACE
 - 02.213 (E) FIRE EXTINGUISHER CABINET TO REMAIN, PROTECT IN PLACE
 - 02.219 REMOVE AND REPLACE (E) EPONY COUNTERTOP AND BACK SPLASH. REFURISH (E) BASE CABINETS TO LIKE NEW CONDITION. TYPICAL. PATCH/REPAIR WALL AS REQUIRED BEFORE INSTALLATION OF NEW COUNTERTOP AND BACKSPLASH.
 - 02.418 REMOVE (E) STUDENT PENINSULA IN ITS ENTIRETY INCLUDING BUT NOT LIMITED TO SINK, PLUMBING LINES, ELECTRICAL SYSTEM. SEE PLUMBING AND ELECTRICAL DWG. FOR MORE INFO
 - 02.420 REMOVE AND REPLACE (E) SINK
 - 02.426 REMOVE (E) DOOR/FRAME/GLAZING TRANSOM
 - 02.430 REMOVE (E) CASEWORK, PATCH/REPAIR/PAIN (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH.
 - 02.431 REMOVE/REPLACE (E) BASE
 - 02.440 REMOVE AND REPLACE (E) WALL BASE, SEE SHEET A1-1.1 DEMO FLR. PLAN GENERAL NOTE#1 FOR ADDITIONAL INFORMATION
 - 02.453 REMOVE AND REPLACE (E) SIGN, TYPICAL. PATCH/REPAIR/PAIN (E) WALLS AS REQUIRED TO MATCH ADJACENT MATERIAL AND FINISH. SEE SHEET G-2 FOR NEW SIGNAGE PLANS
 - 02.462 RELOCATE (E) CASEWORK. REPAIR/REFURISH AS REQUIRED. (E) UPPER CABINETS TO BE REINSTALLED PER DEMO GENERAL NOTE #6
 - 02.464 RELOCATE ALL SURFACE MOUNTED ELECTRICAL AND DATA CONDUITS WITHIN WALL, TYPICAL. THROUGHOUT PROJECT, REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION AND LOCATIONS OF THESE ITEMS.
 - 02.465 RELOCATE ITEM. PATCH/REPAIR/PAIN WALL PRIOR TO PLACING ITEM IN NEW HEIGHT LOCATION. MATCH (E) ADJACENT WALL MATERIAL AND FINISH.
- NEW CONSTRUCTION KEYNOTE**
- 06.415 (N) EPONY COUNTERTOP WITH 4" BACKSPLASH
 - 06.420 (N) CONTINUOUS COUNTERTOP
 - 08.111 (N) DOOR PER SCHEDULE.
 - 08.112 (N) DOOR, FRAME AND TRANSOM GLAZING, SEE DOOR SCHEDULE
 - 08.140 WOOD DOOR
 - 09.651 (N) RESILIENT BASE PER FINISH SCHEDULE.
 - 10.114 TACKABLE WALL PANEL SYSTEM
 - 10.145 EXIT SIGNAGE
 - 10.287 RELOCATED SOAP/SANITIZER DISPENSER
 - 11.521 (N) 16"9 PROJECTION SCREEN
 - 22.405 (N) SINK/FAUCET PER PLUMBING DWG.
 - 22.416 (N) ACCESSIBLE SINK W/FAUCET PER PLUMBING DWG.
 - 22.417 (N) GAS/AIR TURRET, TYPICAL. REFER TO PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION
 - 22.452 (N) ACCESSIBLE EYE/FACE WASH EQUIPMENT W/RAILS, SEE DETAIL 17/AD-1.1
 - 23.380 (N) ACCESSIBLE COMPLIANT FUME HOOD, CONTRACTOR TO COORDINATE WITH EXISTING HOOD CONNECTIONS, ELECTRICAL/MECHANICAL DRAWINGS, ETC.

GENERAL NOTES

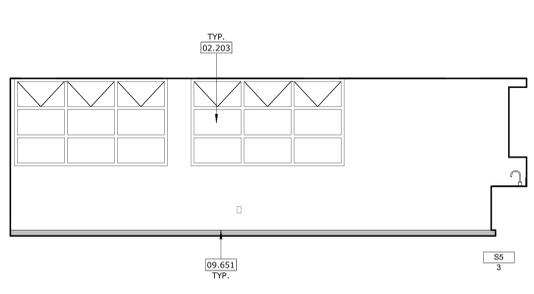
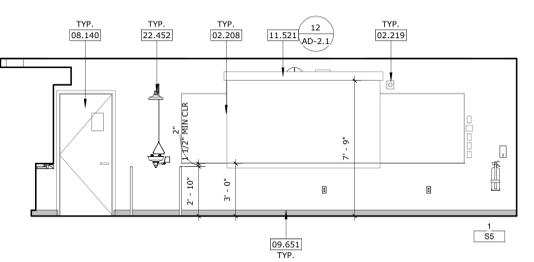
1. VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
 2. ALL DIMENSIONS ARE TO FACE OF STUD, CENTERLINE OF COLUMN OR EDGE OF SLAB, U.N.O.
 3. PROVIDE STUD BRACING AND SUPPORT FOR ALL WALL MOUNTED FIXTURES AND ACCESSORIES.
- PER DETAIL 5
AD-1.2

LEGEND

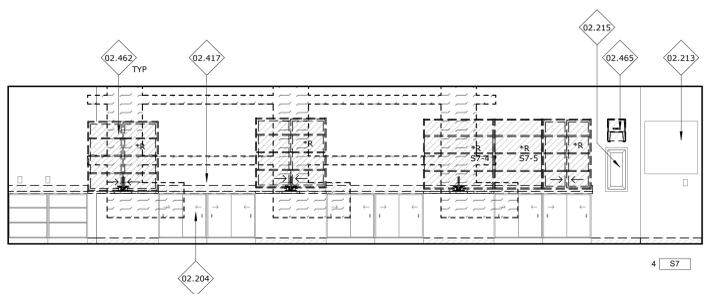
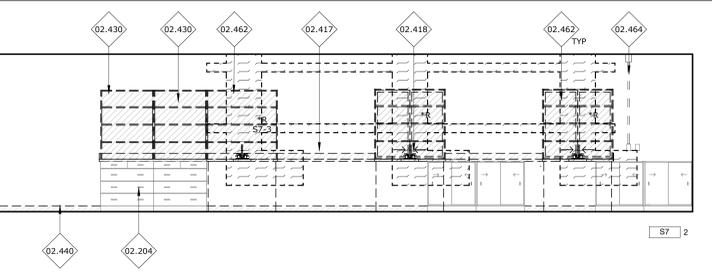
- TWP-1 TACKABLE WALL PANEL
 - *R ← RELOCATE/RELOCATED CASEWORK
 - SX-X → FROM/TO LOCATION
 - DEMOLISH (E) GYPSUMBOARD AND REPLACE IN KIND
- NOTE:**
SEE COLOR, MATERIAL AND FINISHES LEGEND (CMP) ON SHEET ID-1.0 FOR ADDITIONAL INFORMATION



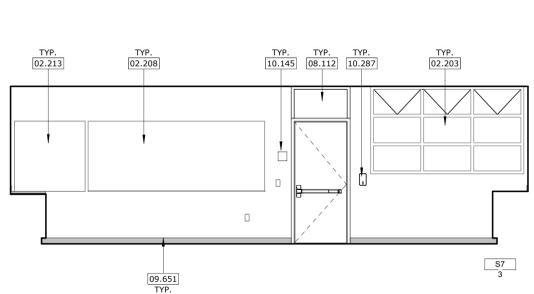
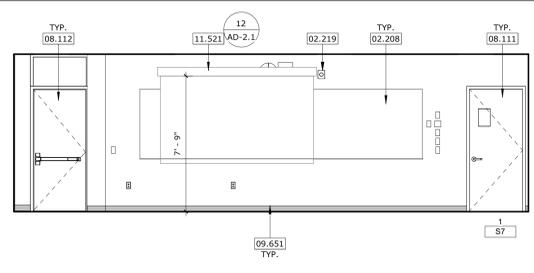
S5 CHEMISTRY - DEMO SCALE: 1/4" = 1'-0" 1



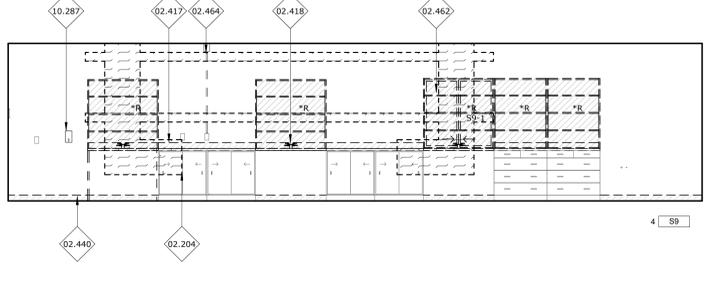
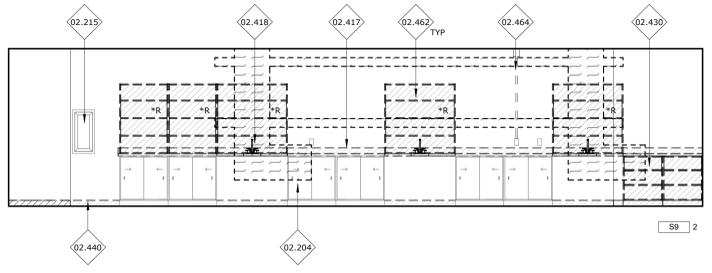
S5 CHEMISTRY - MOD. SCALE: 1/4" = 1'-0" 2



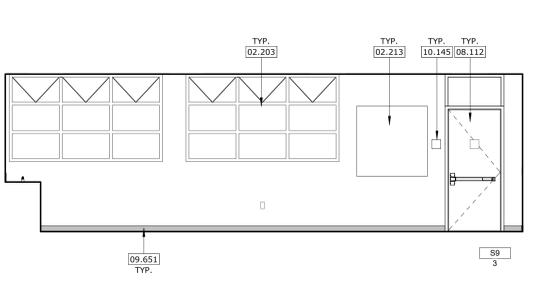
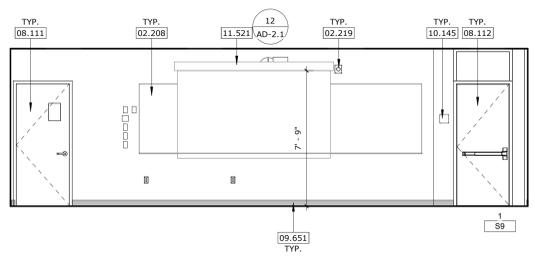
S7 EARTH/SPACE - DEMO SCALE: 1/4" = 1'-0" 3



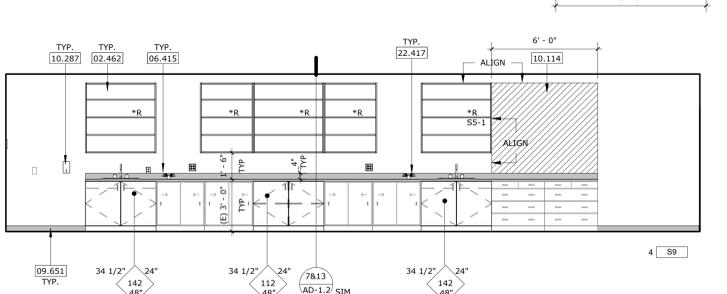
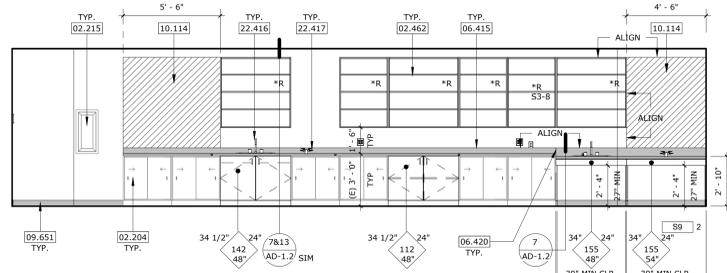
S7 EARTH/SPACE - MOD. SCALE: 1/4" = 1'-0" 4



S9 PHYSICS - DEMO SCALE: 1/4" = 1'-0" 5



S9 PHYSICS - MOD. SCALE: 1/4" = 1'-0" 6



ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION

RUHNAUCLARKE.COM

SCIENCE BLDG. MODERNIZATION

**BUILDING 12
INTERIOR ELEVATIONS**

A-7.5

3775 TENTH STREET, RIVERSIDE CALIFORNIA 92505 (951) 684-4664 / 5753 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92008 (760) 439-3899

8756 MAST BOULEVARD, SANTEE, CA 92071
GROSSMONT UNION HIGH SCHOOL DISTRICT

SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 12-29-2020

DOOR SCHEDULE

DOOR NO.	DOOR TYPE	EXTERIOR	DOOR						FRAME			PANIC HARDWARE	LOCKABLE FROM INSIDE	NEW, REUSE OR EXISTING TO REMAIN	HARDWARE GROUP	REMARKS	DOOR NO.		
			WIDTH	HEIGHT	THICKNESS	MATERIAL	FINISH	COLOR	MATERIAL	FINISH	COLOR							HEAD	JAMB 1
1205A	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15A	1205A
1205B	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15A	1205B
1212A	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15A	1212A
1213A	C	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	14/AD-6.1	*	*	N	4A	1213A
1213B	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15A	1213B
1214A	C	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	-	-	14/AD-6.1	*	*	N	31A	1214A
1215A	C	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	-	-	14/AD-6.1	*	*	N	35	1215A
1216A	C	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	-	-	14/AD-6.1	*	*	N	03B	1216A
1217A	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	08	1217A
1218A	C	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	-	-	14/AD-6.1	*	*	N	36	1218A
1218B	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15A	1218B
1219A	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	10	1219A
51A	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15	51A
51B	B	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	-	-	14/AD-6.1	*	*	N	04A	51B
51C	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15A	51C
52A	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15	52A
52B	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1 SIM	11/AD-6.1	*	*	N	15A	52B
52C	B	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	7/AD-6.1	7/AD-6.1	14/AD-6.1	*	*	N	04A	52C
53A	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15	53A
53B	B	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	7/AD-6.1	7/AD-6.1	14/AD-6.1	*	*	N	04A	53B
53C	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1 SIM	11/AD-6.1	*	*	N	15A	53C
54A	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15	54A
54B	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1 SIM	11/AD-6.1	*	*	N	15A	54B
54C	B	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	-	-	14/AD-6.1	*	*	N	04A	54C
55A	B	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	-	-	14/AD-6.1	*	*	N	04B	55A
55B	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15	55B
55C	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15	55C
56A	B	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	-	-	14/AD-6.1	*	*	N	04A	56A
56B	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15A	56B
57A	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1 SIM	11/AD-6.1	*	*	N	15A	57A
57B	B	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	7/AD-6.1	7/AD-6.1	14/AD-6.1	*	*	N	04A	57B
57C	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15A	57C
58A	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	10816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15	58A
58B	C	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	7/AD-6.1	7/AD-6.1	14/AD-6.1	*	*	N	03	58B
58C	C	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	7/AD-6.1	7/AD-6.1	14/AD-6.1	*	*	N	03	58C
58D	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	10816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15	58D
58E	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15-EO	NO EXTERIOR HARDWARE
58F	-	*	5'-0"	10'-9"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	-	-	14/AD-6.1	*	*	N	EDTR-PR	NO EXTERIOR HARDWARE
58G	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15-EO	NO EXTERIOR HARDWARE
59A	B	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	7/AD-6.1	7/AD-6.1	14/AD-6.1	*	*	N	04A	59A
59B	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1 SIM	11/AD-6.1	*	*	N	15A	59B
59C	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15	59C
510A	B	*	3'-0"	7'-0"	1 3/4"	WD	SC	SC-1	HM	PSG	P-5	-	-	14/AD-6.1	*	*	N	04A	510A
510B	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15	510B
510C	A	*	3'-0"	7'-0"	1 3/4"	HM	PSG	P-5	HM	PSG	P-5	5816/AD-6.1	9/AD-6.1	11/AD-6.1	*	*	N	15A	510C



IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT

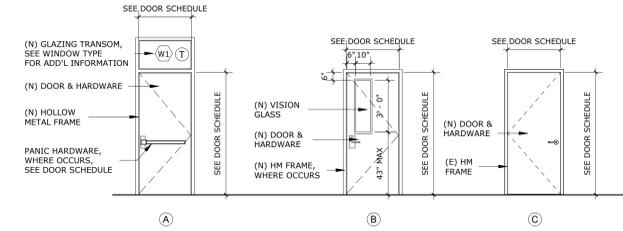
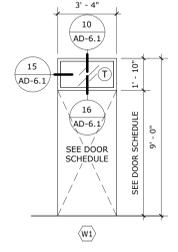
APP: 04-119771 INC.
REVIEWED FOR
DATE: 03/11/2021

RUHNAU
CLARKE
ARCHITECTS

GENERAL NOTES

1. FOR ALUMINUM & HOLLOW METAL FRAME DETAILS, REFER TO SHEET AD-6.1
2. SET DOORS ADJACENT TO WALLS A MIN. OF 4" AWAY FROM WALL U.N.O.
3. ALL GLAZING IN DOORS, AND WINDOWS BELOW 8'-0" A.F.F., ARE TEMPERED OR AS REQUIRED BY SECTION 2406 OF THE 2019 CBC
4. ALL EXTERIOR DOORS ARE TO SWING OUT AND OPEN TO A MIN. OF 110 DEGREES FROM ITS CLOSED POSITION WHERE POSSIBLE, U.N.O.
EXCEPTION: WHERE FACILE SIGNAGE IS LOCATED ON HINGE SIDE OF DOOR, DOORS TO HAVE A 90 DEGREE SWING LIMIT
5. ALL EXTERIOR DOORS SHALL HAVE A POLYSTYRENE CORE (THERMAL RESISTANCE)
6. PROVIDE AIR SEALS/WEATHER STRIPPING AT ALL EXTERIOR DOORS TO CONDITIONED SPACES.
7. ALL FLOOR MATERIAL CHANGE SHALL BE LOCATED UNDER THE CENTERLINE OF DOOR WHERE OCCURS, TYP.
8. ALL EXTERIOR DOORS SHALL BE OPERABLE FROM THE INTERIOR WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT. DEAD BOLTS ARE ONLY PERMITTED WHEN OPERABLE WITH A SINGLE EFFORT LEVER TYPE HARDWARE.
9. HAND ACTIVATED DOOR OPENING HARDWARE SHALL BE MOUNTED 34"-44" A.F.F.
10. ALL DOORS SHALL BE LOCKABLE FROM THE INTERIOR SIDE
11. PER SECTION 1008.1.10 IN THE CBC 2019, DOOR SERVING ROOMS OR SPACES WITH AN OCCUPANT LOAD OF 50 OR MORE ARE REQUIRED TO HAVE PANIC HARDWARE OR FIRE EXIT HARDWARE.
12. PER CBC 2019 11B-404.2.5, THRESHOLDS SHALL BE 1/2" HIGH MAX., SEE DETAIL 11 AD-6.1
13. THE BOTTOM 10" OF ALL DOORS EXTENDING THE FULL WIDTH SHALL HAVE A SMOOTH UNINTERRUPTED SURFACE TO ALLOW THE DOOR TO BE OPENED BY A WHEELCHAIR FOOTREST WITHOUT CREATING A TRAP OR HAZARDOUS CONDITION. CBC 2019 11B-404.2.10
14. MAXIMUM EFFORT TO OPERATE ALL DOORS SHALL NOT EXCEED 5 LBS. FOR BOTH EXTERIOR AND INTERIOR DOORS. FIRE DOORS SHALL NOT EXCEED 15 LBS. CBC 2019 11B-404.2.9
15. REFER TO SPECIFICATION SECTION 08 71 00 FOR DOOR HARDWARE INFORMATION
16. REFER TO SIGNAGE SCHEDULE IN SECTION 10 14 00 FOR MORE INFORMATION.
17. FOR SIGNAGE ATTACHMENTS AND LOCATIONS, REFER TO SHEET AD-1.1
18. ALL FINISHES SHALL COMPLY WITH CBC

NOTE:
ALL EXISTING RATED DOORS TO MAINTAIN RATED SYSTEM



WINDOW TYPE SCALE: 1/4" = 1'-0" **18**

DOOR TYPE SCALE: 1/4" = 1'-0" **8**

ABBREVIATIONS

ACP	ACOUSTICAL CEILING PANEL	PL	PLASTIC LAMINATE
ACT	ACTUATOR	PF	PAINT, FLAT
AN	ANODIZED	PG	PAINT, GLOSS
ALUM	ALUMINUM	PSG	PAINT, SEMI-GLOSS
AWP	ACOUSTIC WALL PANEL	QT	QUARRY TILE
CDG	CORNER GUARD	RB	RUBBER BASE
CLP	COMPOSITE LAMINATE PANEL	RES	RESIN/EPoxy FLOORING
CMK	CONCRETE MASONRY UNIT	RS	ROLLER SHADE SYSTEM
CONC	CONCRETE	SC	SEALED CONCRETE
CPL	CEMENT PLASTER	SAF	SYNTHETIC ATHLETIC FLOORING
CABR	CABINET	SEAL	SEALED CONCRETE
CT	CERAMIC TILE	SSM	SOLID SURFACE MATERIAL
DIS	DISPLAY CASE	ST	STAIN WOOD COLOR
EPOXY	EPOXY FLOOR	STL	STEEL
EXP	EXPOSED	SV	SHEET VINYL
FF	FACTORY FINISH	TWP	TACKABLE WALL PANEL
FCP	FIBER CEMENT LAP SIDING	U.O.S.	UNDERSIDE OF STRUCTURE
FEP	FIBERGLASS REINFORCED PANEL	VCB	VENTED COVERED BASE
G	GROUT	VCT	VINYL COMPOSITION TILE
GAVL	GALVANIZED	VF	VINYL FABRIC
GPI	GYPSUM PLASTER	VWC	VINYL WALL COVERING
GWB	GYPSUM WALLBOARD	WACP	WASHABLE ACOUSTICAL CEILING
GWRB	WATER RESISTANT GWB	WAF	WOOD ATHLETE FLOORING
HC	HOLLOW CORE	WDM	WOOD MASSIVE FLOORING
HW	HOLLOW METAL	WDP	WOOD MASSIVE FLOORING
ICB	INTEGRAL COVERED BASE	WP	WOOD MASSIVE FLOORING
LVT	LUXURY VINYL TILE	WS	WALL SYSTEM
MESH	METAL MESH SYSTEM		
MPS	METAL PANEL SYSTEM		
OP	OPERABLE PARTITION		
PCPL	PORTLAND CEMENT PLASTER OVER METAL LATH, SAND FINISH		
PES	PAINT - EGGSHELL		

GLAZING NOTES

- GLAZING TYPES**
- ① TYPE GL-1 : INSULATING GLASS; VISION GLASS, DOUBLE GLAZED
 - ② TYPE GL-2 : INSULATING GLASS; SAFETY GLAZING
 - ③ TYPE GC-3 : POLYSULFIDE SEALANT
 - ④ TYPE GC-5 : SILICONE SEALANT
- GENERAL GLAZING NOTES**
- VERIFY ALL DIMENSIONS IN FIELD PRIOR TO FABRICATION
- ALL EXTERIOR GLAZED DOORS AND WINDOWS TO RECEIVE TYPE ③ GLAZING, U.N.O.
- GLAZING TO BE TEMPERED SHALL INCLUDE
- ALL GLAZING IN DOORS
ALL DOOR SIDELIGHTS WITHIN 24" OF DOOR FRAME
ALL DOOR TRANSOMS
ALL WINDOW GLAZING WITHIN A DISTANCE OF 36" HORIZONTALLY FORM A WALKING PATH AND UP TO 60" FROM GRADE
ALL GLAZING WITHIN THE SWING OF A DOOR
- ALL INTERIOR DOORS AND WINDOWS TO RECEIVE TYPE ① GLAZING, U.N.O.
- Ⓧ TEMPERED GLASS

PROJECT No. :1-30-50
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3775 TENTH STREET, RIVERSIDE CALIFORNIA 92508 (951) 684-4664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92008 (619) 438-5899

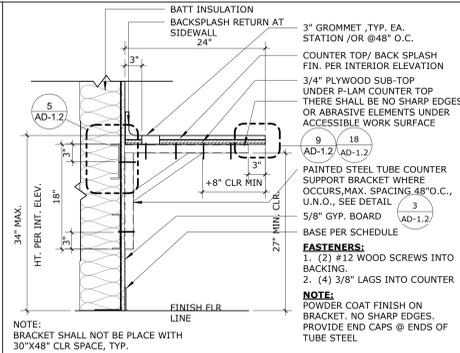
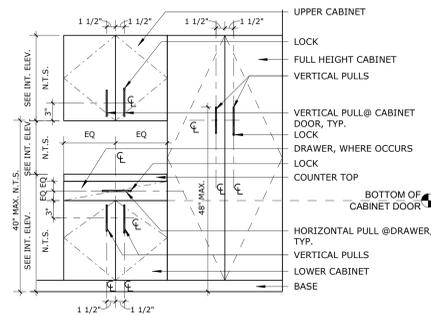
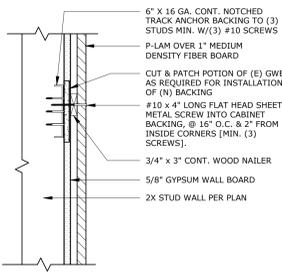
SCIENCE BLDG. MODERNIZATION

8756 MAST BOULEVARD, SANTEE, CA 92071
GROSSMONT UNION HIGH SCHOOL DISTRICT

DOOR & WINDOW
SCHEDULE

A-8.1

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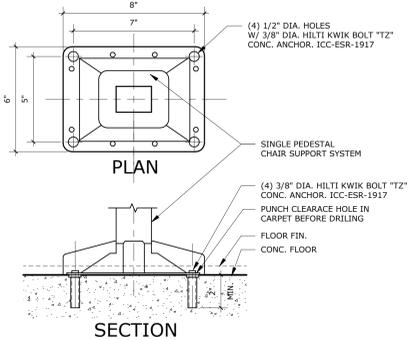
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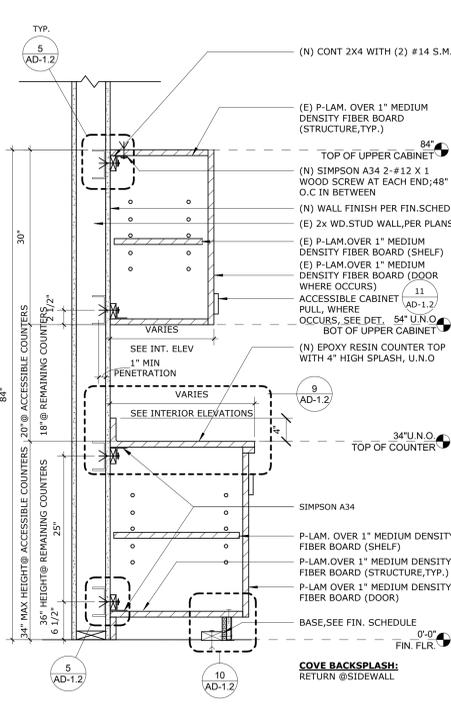
CASEWORK BACKING @ STUDS SCALE: 1/2" = 1'-0" 16

TYP. CABINET PULLS SCALE: 1" = 1'-0" 11

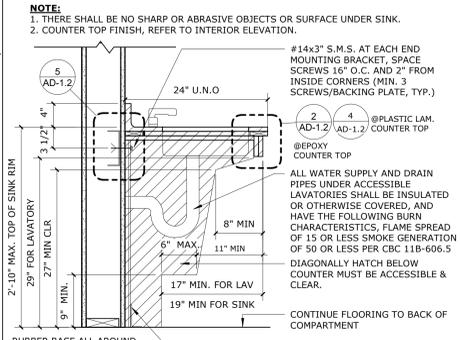
COUNTERTOP BRACKET SCALE: 1" = 1'-0" 6



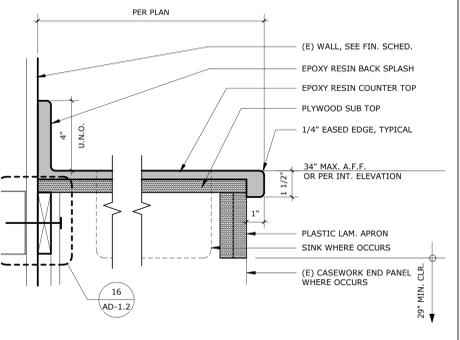
FIXED SEAT ANCHORAGE SCALE: 3" = 1'-0" 17



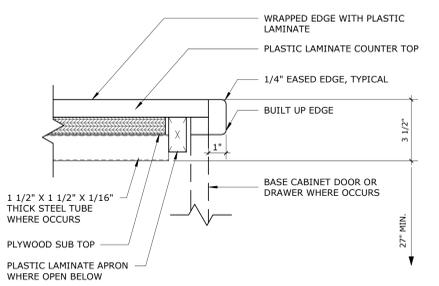
UPPER & BASE CABINET SCALE: 1" = 1'-0" 13



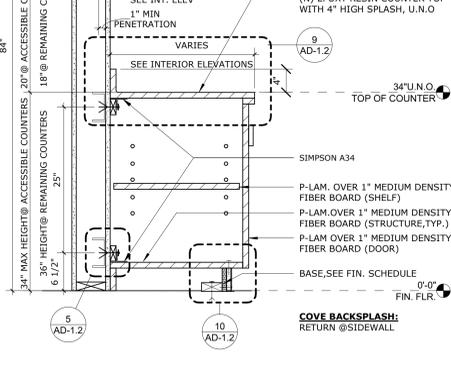
SINK CLEARANCE SCALE: 1" = 1'-0" 7



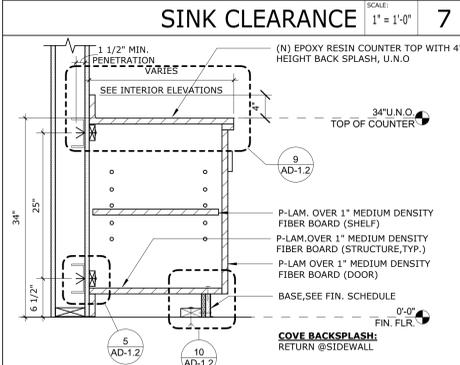
TYP. COUNTER TOP EDGE SCALE: 3" = 1'-0" 2



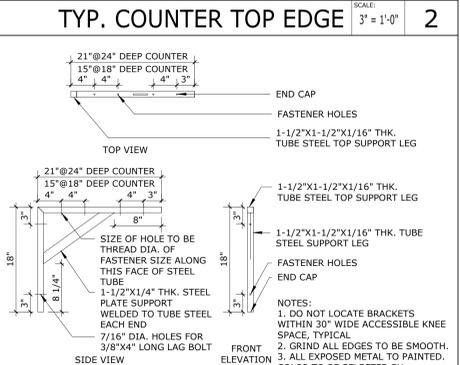
TYP. COUNTER TOP EDGE SCALE: 3" = 1'-0" 18



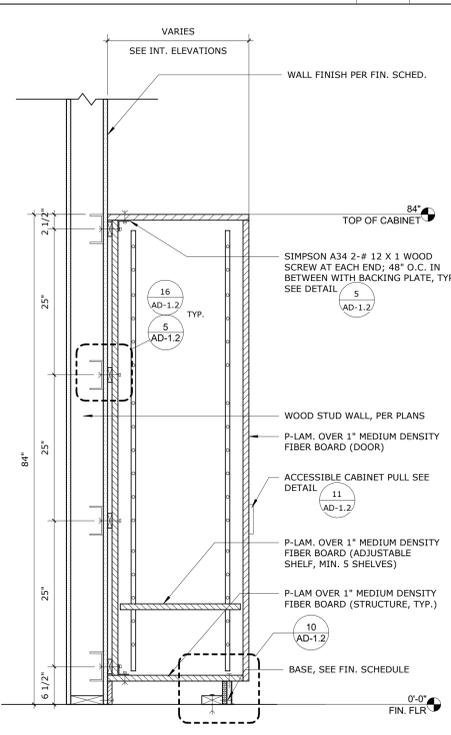
COVE BACKSPLASH SCALE: 1" = 1'-0" 10



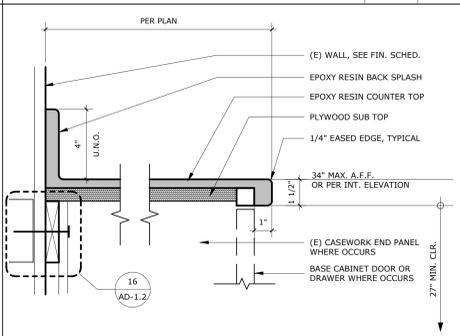
BASE CABINET SCALE: 1" = 1'-0" 8



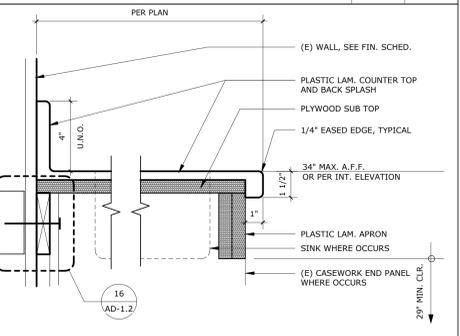
BRACKET SCALE: 1" = 1'-0" 3



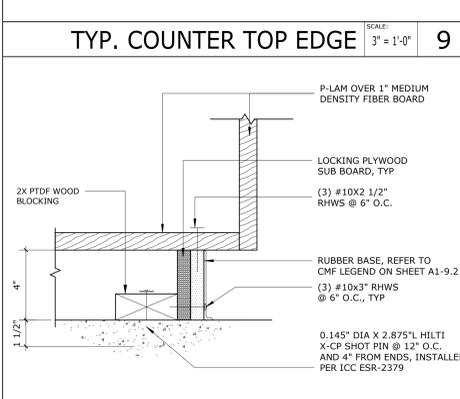
FULL HEIGHT CABINET SCALE: 1" = 1'-0" 15



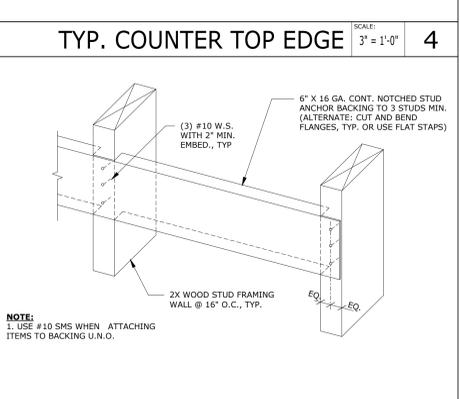
TYP. COUNTER TOP EDGE SCALE: 3" = 1'-0" 9



TYP. COUNTER TOP EDGE SCALE: 3" = 1'-0" 4



FRONT CABINET ANCHOR SCALE: 1" = 1'-0" 10



TYP. BLOCKING @ STUD WALL SCALE: 1/2" = 1'-0" 5

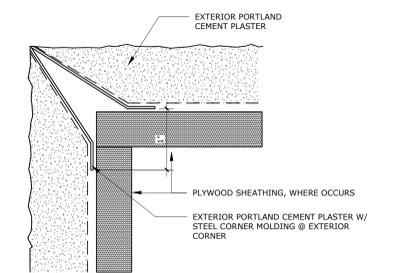
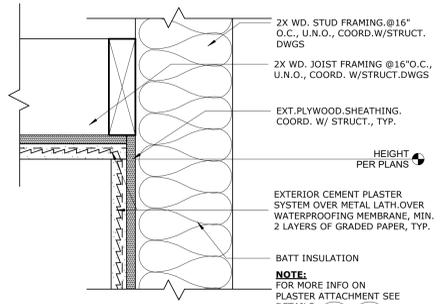
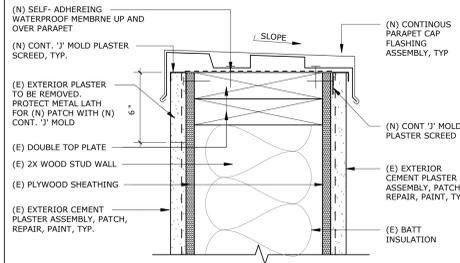
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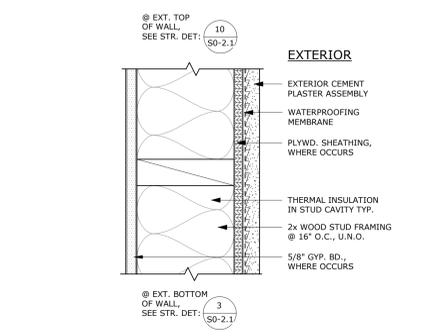
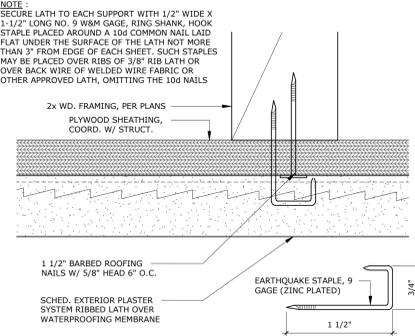
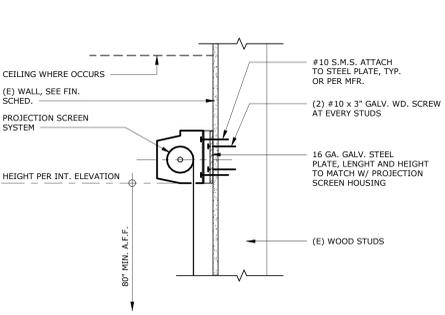


STAMPS
 CONSULTANT BRANDING

ROOF WALL CAP SCALE: 3" = 1'-0" **16**

FRAMED CEILING PLASTER SCALE: 3" = 1'-0" **11**

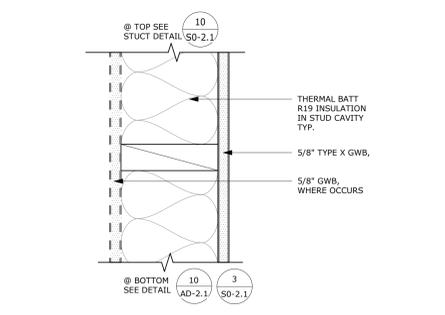
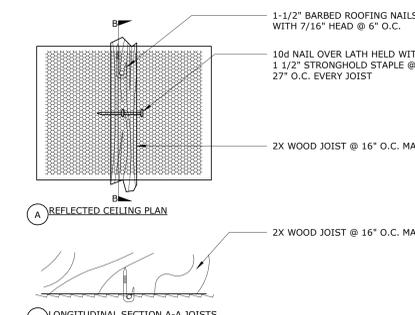
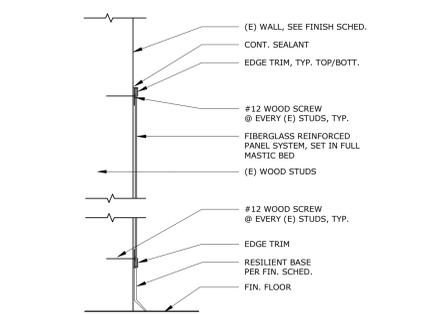
EXTERIOR CORNER SCALE: 12" = 1'-0" **6**



PROJECTION SCREEN SCALE: 1 1/2" = 1'-0" **12**

WALL METAL LATH SCALE: 12" = 1'-0" **7**

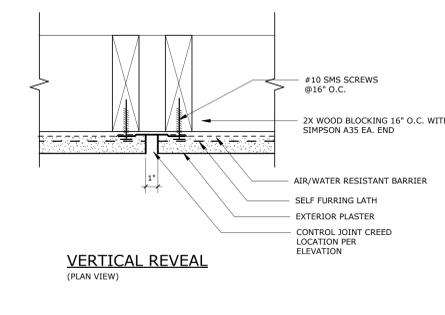
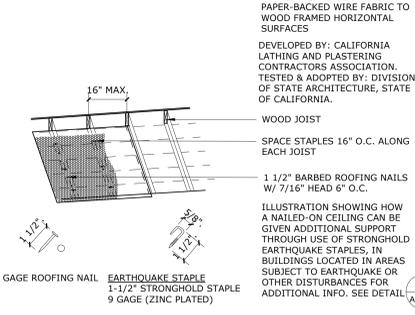
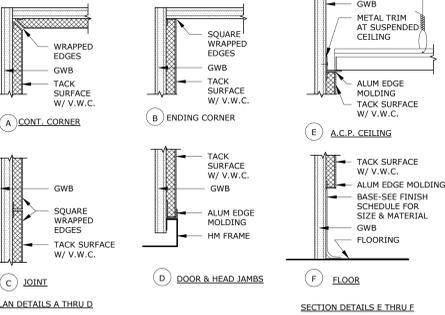
WALL A1 SCALE: 3" = 1'-0" **2**



FIBERGLASS REINF. PANEL SCALE: 3" = 1'-0" **13**

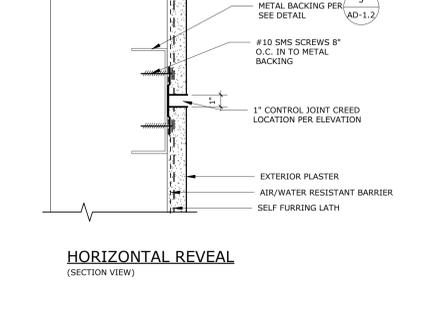
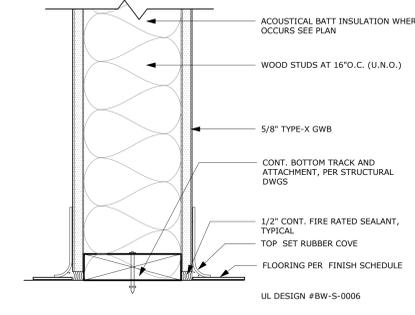
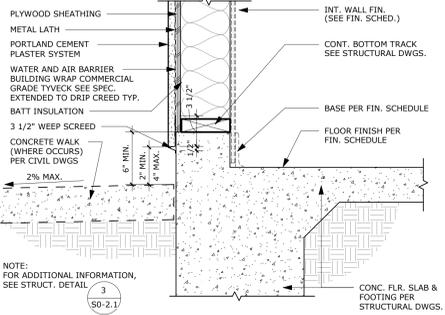
LATH DETAIL SCALE: 3" = 1'-0" **8**

WALL B1 SCALE: 3" = 1'-0" **3**



TACK SURFACE PANEL DETAILS SCALE: 1/4" = 1'-0" **14**

LATH DETAIL SCALE: 1 1/2" = 1'-0" **9**



EXT. WALL SILL PLATE CURB SCALE: 1 1/2" = 1'-0" **15**

TYP. WALL BASE SCALE: 3" = 1'-0" **10**

PLASTER REVEAL JOINT SCALE: 3" = 1'-0" **5**

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WALL TYPES & DETAILS AD-2.1

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 8756 MAST BOULEVARD, SANTEE, CA 92071
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METAL SUSPENSION SYSTEMS FOR LAY-IN PANEL CEILINGS: 2010 CBC (PER DSA IR 25-2.1.3)

1. CEILING SYSTEM GENERAL NOTES:
1.01 CEILING SYSTEM COMPONENTS SHALL COMPLY WITH ASTM C635 -07 AND SECTION 5.1 OF ASTM E580-10A.
1.02 THE CEILING GRID SYSTEM MUST BE RATED HEAVY DUTY AS DEFINED BY ASTM C635-07.
1.03 CEILING SYSTEMS, THE FOLLOWING CEILING SYSTEM (S) IS/ARE PART OF THE SCOPE OF THIS PROJECT:

ACT ONLY:
MANUFACTURER'S NAME: ARMSTRONG WORLD INDUSTRIES
PRODUCT EVALUATION REPORT TYPE AND NUMBER: ICC ESR -1308
MANUFACTURER'S MODEL NUMBER - MAIN RUNNER: 7301
MANUFACTURER'S CATALOG NUMBER - CROSS RUNNER: XL7342, XL7328
FOR OTHER SYSTEMS, SEE SPEC 09 51 00

1.04 SEISMIC WALL CLIP:
MANUFACTURER'S MODEL: BERCC

1.05 CEILING PANELS SHALL NOT SUPPORT ANY LIGHT FIXTURES, AIR TERMINALS OR DEVICES.
1.06 FOR CEILING INSTALLATIONS UTILIZING ACOUSTICAL TILE PANELS OF MINERAL OR GLASS FIBER, IT IS NOT MANDATORY TO PROVIDE 3/4" CLEARANCE BETWEEN THE ACOUSTICAL TILE PANELS AND THE WALL ON THE SIDES OF THE CEILING WHICH ARE FREE TO SLIP. FOR ALL OTHER CEILING PANEL TYPES, PROVIDE 3/4" CLEARANCE BETWEEN THE CEILING PANEL AND THE WALL ON THE SIDES OF THE CEILING FREE TO SLIP.

2. MATERIALS:
2.01 CEILING WIRE SHALL BE CLASS 1 ZINC COATED (GALVANIZED) CARBON STEEL CONFORMING TO ASTM A641 -09A. WIRE SHALL BE #12 GAGE (0.106" DIAMETER) WITH SOFT TEMPER AND MINIMUM TENSILE STRENGTH=70KSI

2.02 GALVANIZED SHEET STEEL (INCLUDING THAT USED FOR METAL STUD AND TRACK COMPRESSION STRUTS/POST) SHALL CONFORM TO ASTM 653-11, OR OTHER EQUIVALENT SHEET STEEL LISTED IN SECTION A2.1 OF THE NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS 2007, INCLUDING SUPPLEMENT 2 DATED 2010 (AISI S100 -07/52-10). MATERIALS 43 MIL (18 GAGE) AND LIGHTER SHALL HAVE MINIMUM YIELD STRENGTH OF 33 KSI. MATERIAL 54 MIL (16 GAGE) AND HEAVIER SHALL HAVE A MINIMUM YIELD STRENGTH OF 50 KSI.

2.03 ELECTRICAL METALLIC TUBE (EMT) SHALL BE ANSI C80.3/UL 797 CARBON STEEL WITH G90 GALVANIZING SHALL HAVE MINIMUM YIELD STRENGTH(F_y) OF 30 KSI AND MINIMUM ULTIMATE STRENGTH (F_u) OF 48 KSI.

3. ATTACHMENT OF HANGER AND BRACING WIRES:
3.01 SEPARATE ALL CEILING HANGER AND BRACING WIRES AT LEAST SIX(6) INCHES FROM ALL UNBRACED DUCTS, PIPES, CONDUIT, ETC.
3.02 HANGER AND BRACING WIRES SHALL NOT ATTACH TO OR BE BOUND AGAINST OBSTRUCTIONS INCLUDING BUT NOT LIMITED TO: PIPING, DUCTWORK, CONDUIT, ETC.
3.03 HANGER WIRES THAT ARE MORE THAN ONE (HORIZONTAL) IN SIX (VERTICAL) OUT OF PLUM SHALL HAVE COUNTER-SLOPING WIRES.
3.04 SLACK SAFETY WIRES SHALL BE CONSIDERED HANGER WIRES FOR INSTALLATIONS AND TESTING REQUIREMENTS.

HANGER AND BRACING WIRE ANCHORAGE TO THE STRUCTURE SHALL BE INSTALLED IN SUCH A MANNER THAT THE DIRECTION OF THE WIRE (E.G. BRACING WIRE CEILING CLIPS MUST BE BENT AS SHOWN IN THE DETAILS AND ROTATED AS REQUIRED TO ALIGN CLOSELY WITH THE DIRECTION OF THE WIRE, SCREW EYES IN WOOD MUST BE INSTALLED SO THEY ALIGN CLOSELY WITH THE DIRECTION OF THE WIRE, ETC.

4. FASTENERS AND WELDING:
4.01 SHEET METAL SCREWS SHALL COMPLY WITH ASTM C1513-10, ASME B18.6.4-89 (R2005), PENETRATION OF SCREWS THROUGH JOINED MATERIAL SHALL NOT BE LESS THAN THREE EXPOSED THREADS.
4.02 EXPANSION ANCHORS SHALL BE:
4.03 POWER-ACTUATED FASTENERS SHALL BE:
4.04 IF NOT OTHERWISE SPECIFIED IN THE EVALUATION REPORT, POWER ACTUATED FASTENERS INSTALLED IN STEEL SHALL BE INSTALLED SO THE ENTIRE POINTED END OF THE FASTENER IS DRIVEN THROUGH THE STEEL MEMBER.
4.05 POWER-ACTUATED FASTENERS IN CONCRETE ARE NOT PERMITTED FOR BRACING WIRES.
4.06 CONCRETE REINFORCEMENT AND PRESTRESSING TENDONS SHALL BE LOCATED BY NON-DESTRUCTIVE MEANS PRIOR TO INSTALLING POST-INSTALLED ANCHOR.
4.07 WELDING SHALL BE IN ACCORDANCE WITH AWS D1.3 USING E60XX SERIES ELECTRODES.

5. TESTING: ALL FIELD TESTING MUST BE PERFORMED IN THE PRESENCE OF THE PROJECT INSPECTOR.
5.01 POST-INSTALLED ANCHORS IN CONCRETE USED TO SUPPORT HANGER WIRES SHALL BE TESTED AT A FREQUENCY OF 50 PERCENT IN ACCORDANCE WITH CBC SECTION 1910A.5.

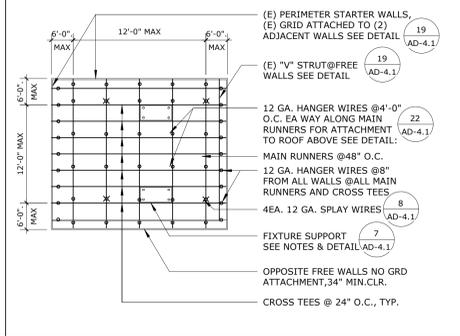
6. LIGHT FIXTURES:
6.01 ALL LIGHT FIXTURES SHALL BE POSITIVELY ATTACHED TO THE CEILING SUSPENSION BY MECHANICAL MEANS TO RESIST A HORIZONTAL FORCE EQUAL TO THE WEIGHT OF THE FIXTURE. A MINIMUM THICKNESS OF #14 GAGE. ROTATIONAL SPRING CATCHES DO NOT COMPLY.
6.02 SURFACE MOUNTED LIGHT FIXTURES SHALL BE ATTACHED TO THE MAIN RUNNER WITH AT LEAST TWO POSITIVE CLAMPING DEVICES. THE CLAMPING DEVICE SHALL COMPLETELY SURROUND THE SUPPORTING CEILING RUNNER AND BE MADE OF STEEL WITH A MINIMUM THICKNESS OF #14 GAGE. ROTATIONAL SPRING CATCHES DO NOT COMPLY.
6.03 LIGHT FIXTURES WEIGHING LESS THAN OR EQUAL TO 10 L.B. SHALL HAVE A MINIMUM OF ONE(1) #12 GAGE SLACK SAFETY WIRE CONNECTED FROM THE FIXTURE HOUSING AT DIAGONAL CORNERS TO THE STRUCTURE ABOVE.
6.04 LIGHT FIXTURES WEIGHING GREATER THAN 10LB. BUT LESS THAN OR EQUAL TO 56LBS. MAY BE SUPPORTED DIRECTLY ON THE CEILING RUNNERS, BUT THEY SHALL HAVE A MINIMUM OF TWO(2) #12 GAGE SLACK SAFETY WIRES CONNECTED FROM THE FIXTURE HOUSING AT DIAGONAL CORNERS TO THE STRUCTURE ABOVE.
6.05 ALL LIGHT FIXTURES WEIGHING GREATER THAN 56LB. SHALL BE INDEPENDENTLY SUPPORTED BY NOT LESS THAN FOUR (4) TAUT #12 GAGE HANGER WIRES(ONE AT EACH CORNER) ATTACHED FROM THE FIXTURE HOUSING TO THE STRUCTURE ABOVE OR OTHER APPROVED HANGERS INCLUDING THEIR ATTACHMENT TO THE STRUCTURE ABOVE, SHALL BE CAPABLE OF SUPPORTING FOUR(4) TIMES THE WEIGHT OF THE FIXTURE.

7. SERVICES WITHIN THE CEILING:
7.01 CEILING MOUNTED AIR TERMINALS OR OTHER SERVICES WEIGHING LESS THAN OR EQUAL TO 20LB. SHALL HAVE ONE (1) #12 GAGE SLACK SAFETY WIRE ATTACHED FROM THE TERMINAL OR SERVICE TO THE STRUCTURE ABOVE.

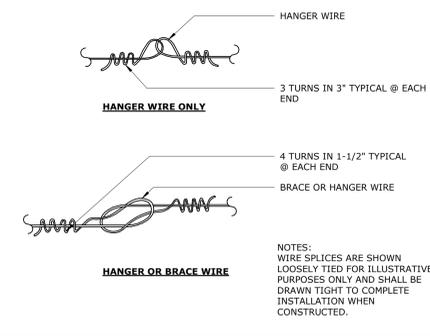
8. OTHER DEVICES WITHIN THE CEILING:
8.01 ALL LIGHT WEIGHT MISCELLANEOUS DEVICES, SUCH AS STROBE LIGHTS, OCCUPANCY SENSORS, SPEAKERS, EXIT SIGNS, ETC., SHALL BE ATTACHED TO THE CEILING GRID. IN ADDITION, DEVICES WEIGHING MORE THAN 10LBS. SHALL HAVE A #12 GAGE SLACK SAFETY WIRE ANCHORED TO THE STRUCTURE ABOVE DEVICES WEIGHING MORE THAN 20 LB. SHALL BE SUPPORTED INDEPENDENTLY FROM THE STRUCTURE ABOVE.

FOOTNOTES:
a. WHEREAS DEFINED IN ASCE 7, SECTION 13.3.1.1:
z=HEIGHT IN STRUCTURE OF POINT OF ATTACHMENT OF CEILING WITH RESPECT TO THE BASE.
h=AVERAGE ROOF HEIGHT OF THE STRUCTURE WITH RESPECT TO THE BASE.
b. IT SHALL BE PERMITTED TO USE THE BRACE ASSEMBLY SPACING FOR "z/h" 0.5" FOR THE FULL BUILDING HEIGHT.

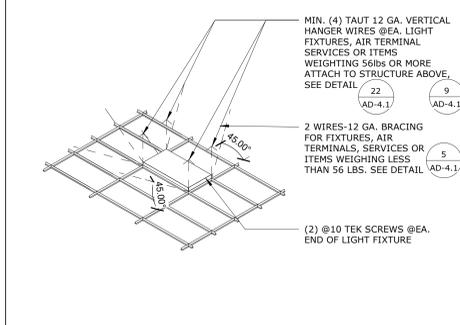
CEILING REQUIREMENTS SCALE: 1/4" = 1'-0" 5



11 LAY-IN CEILING REQUIREMENTS SCALE: 1/2" = 1'-0" 6



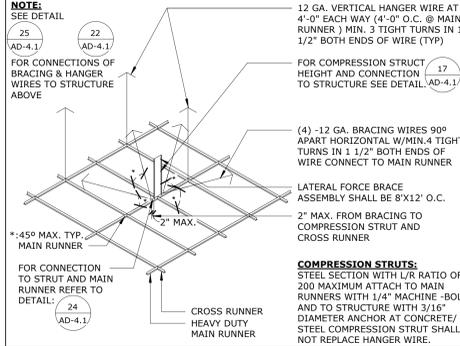
HANGER WIRE DETAIL SCALE: 1 1/2" = 1'-0" 7



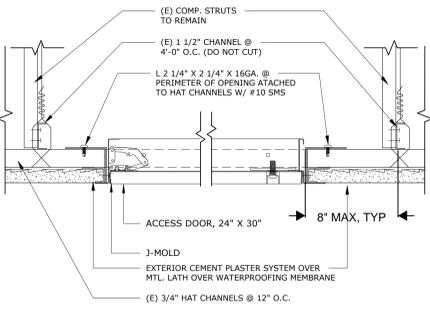
FIXTURE SUPPORT SCALE: 3" = 1'-0" 8



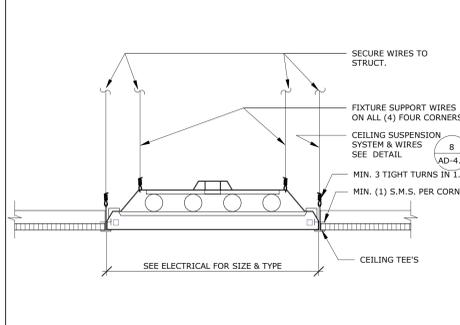
SUSPENSION CEILING BRACING SCALE: 3" = 1'-0" 9



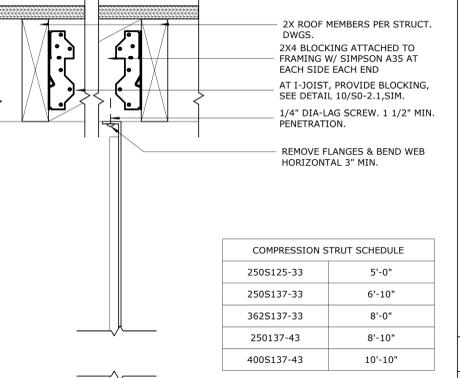
CEILING ACCESS @ PLASTER SCALE: 3" = 1'-0" 10



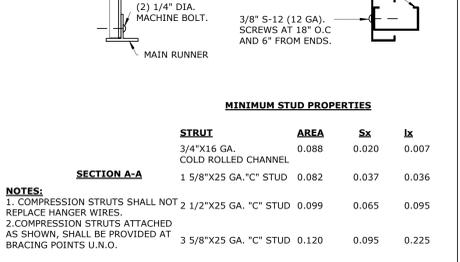
MOUNTED FIXTURE @ GWB SCALE: 3" = 1'-0" 11



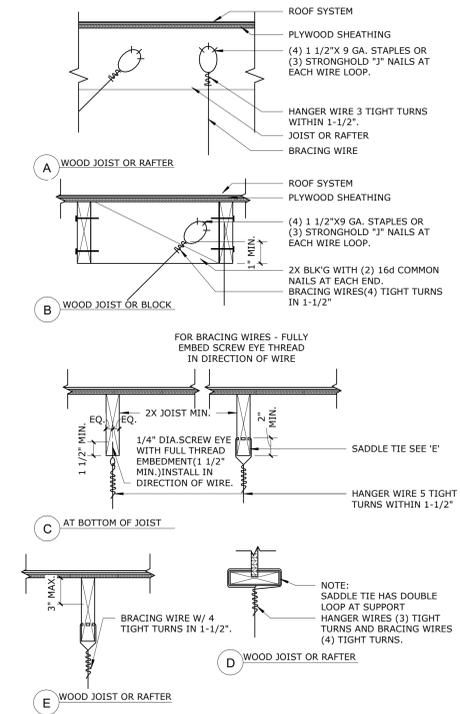
REC. LIGHT FIXTURE @ PLASTER SCALE: 3" = 1'-0" 12



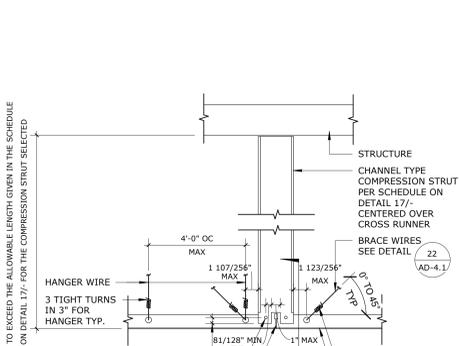
COMPRESSION STRUT SCALE: 3" = 1'-0" 17



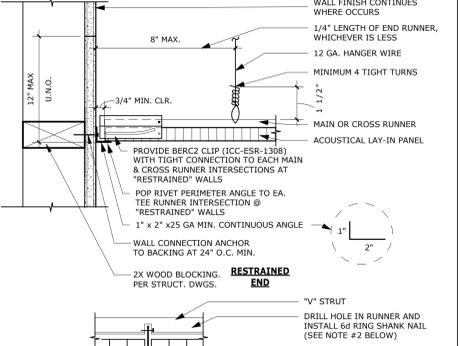
WIRE CONN. @ WOOD FRAME SCALE: 1 1/2" = 1'-0" 22



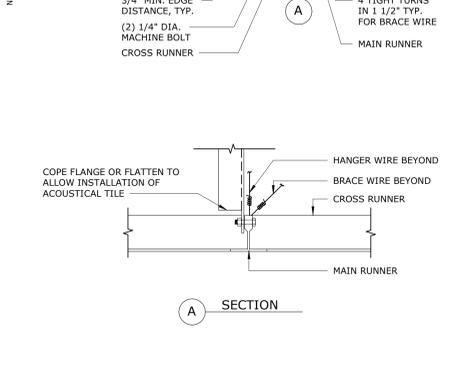
WIRE CONN. @ WOOD FRAME SCALE: 1 1/2" = 1'-0" 22



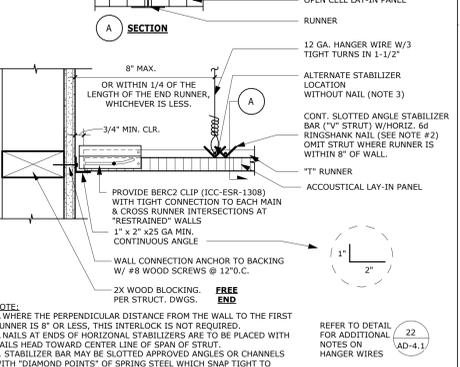
STRUT TO MAIN RUNNER SCALE: 1 1/2" = 1'-0" 24



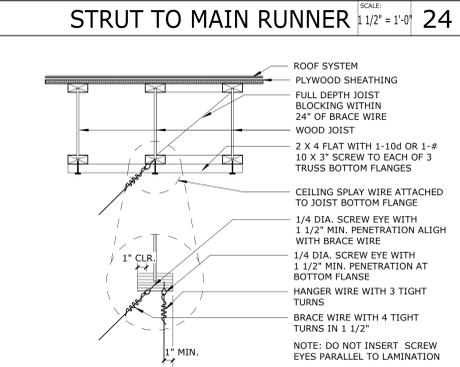
PERIMETER WALL ANGLE SCALE: 3" = 1'-0" 19



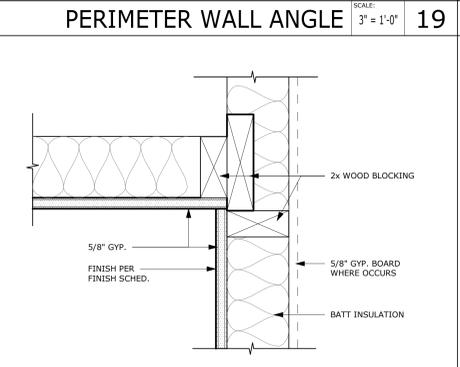
FRAMED GYP BOARD CEILING SCALE: 3" = 1'-0" 20



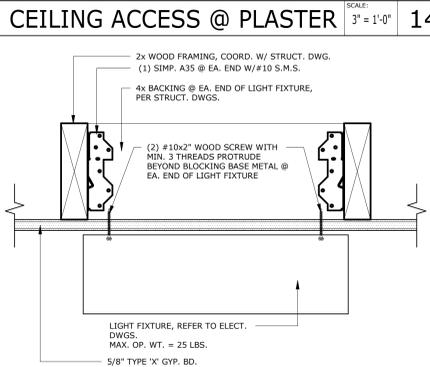
MOUNTED FIXTURE @ GWB SCALE: 3" = 1'-0" 15



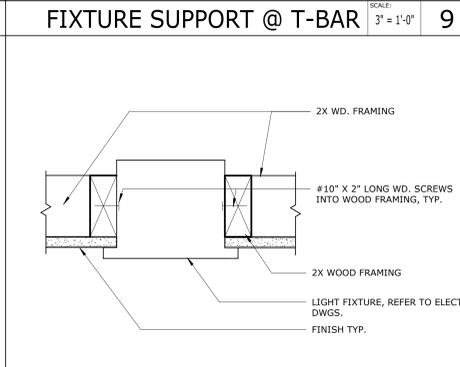
WIRE CONN. @ WOOD FRAME SCALE: 1 1/2" = 1'-0" 25



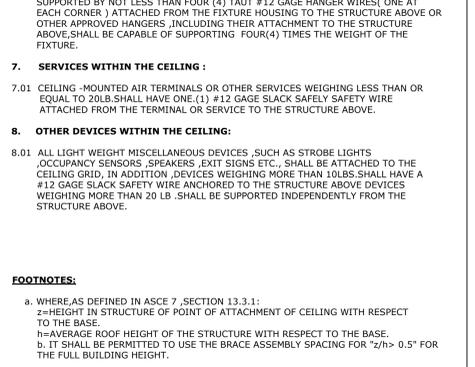
FRAMED GYP BOARD CEILING SCALE: 3" = 1'-0" 20



MOUNTED FIXTURE @ GWB SCALE: 3" = 1'-0" 15



REC. LIGHT FIXTURE @ PLASTER SCALE: 3" = 1'-0" 10



CEILING REQUIREMENTS SCALE: 1/4" = 1'-0" 5

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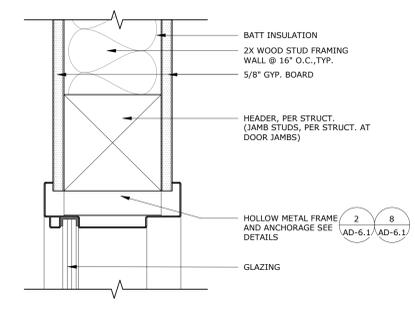
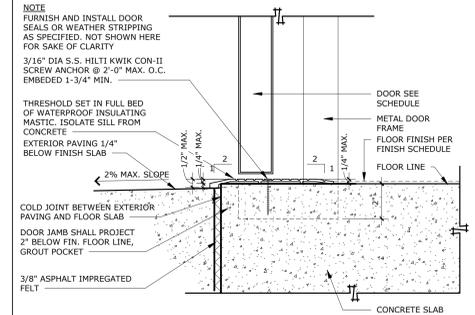
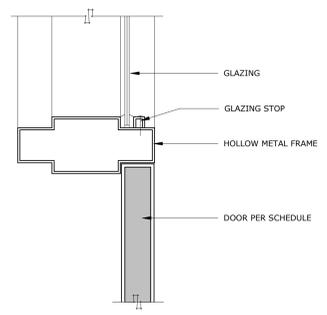
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 APP: 04-119771 INC.
 REVIEWED FOR
 SS FLS ACS
 DATE: 03/11/2021

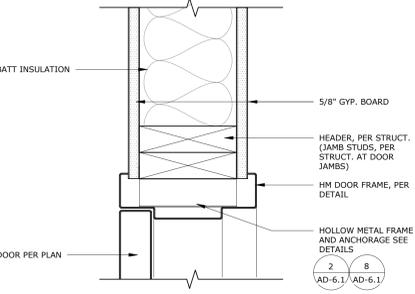
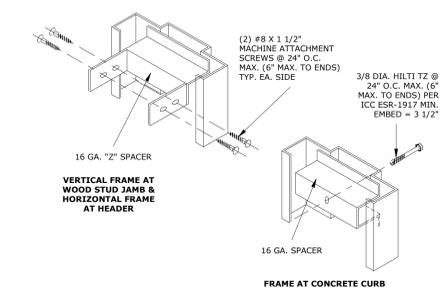
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EXT. H.M. DOOR HEAD @GLZ SCALE: 3" = 1'-0" 16

TYP. THRESH. @ EXT. DOOR SCALE: 3" = 1'-0" 11

INT HM. WINDOW HEAD SCALE: 3" = 1'-0" 6



EXT. H.M. DOOR HEAD @GLZ SCALE: 3" = 1'-0" 16

TYP. THRESH. @ EXT. DOOR SCALE: 3" = 1'-0" 11

INT HM. WINDOW HEAD SCALE: 3" = 1'-0" 6

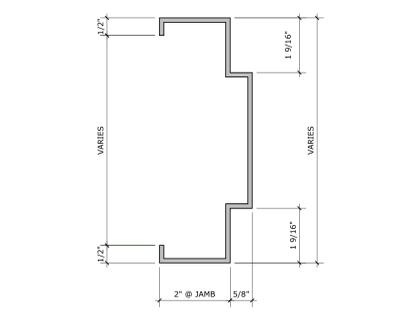
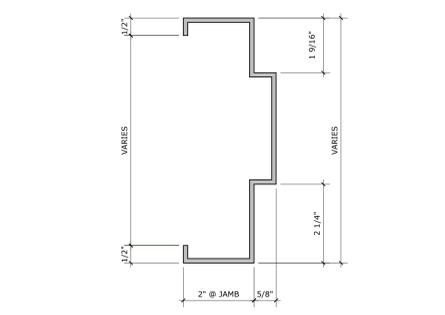
TYP. FRAME ANCHOR SCALE: 12" = 1'-0" 2

INT. DOOR HEAD/JAMB SCALE: 3" = 1'-0" 7

EXT. H.M. DOOR HEAD @GLZ SCALE: 3" = 1'-0" 16

TYP. THRESH. @ EXT. DOOR SCALE: 3" = 1'-0" 11

INT HM. WINDOW HEAD SCALE: 3" = 1'-0" 6



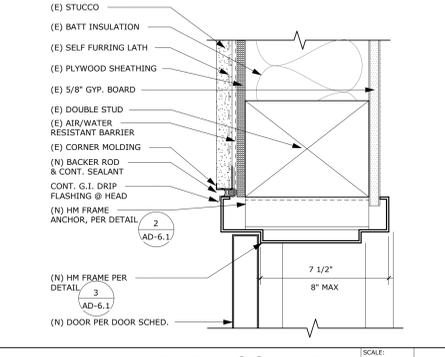
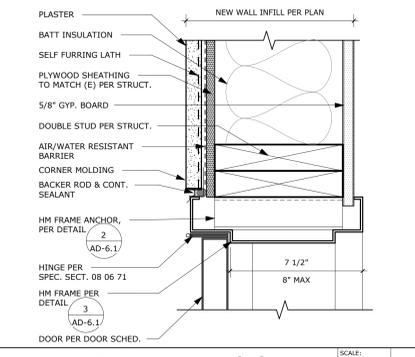
EXT. H.M. DOOR HEAD @GLZ SCALE: 3" = 1'-0" 16

TYP. THRESH. @ EXT. DOOR SCALE: 3" = 1'-0" 11

INT HM. WINDOW HEAD SCALE: 3" = 1'-0" 6

TYP. H.M EXT. DOOR FRAME SCALE: 6" = 1'-0" 3

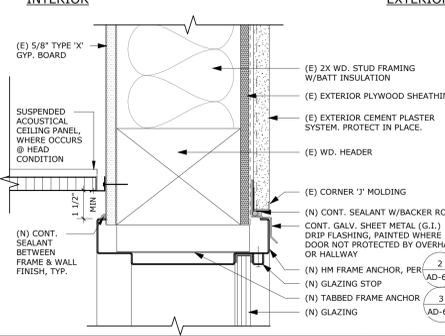
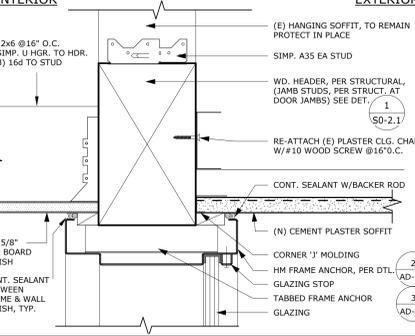
TYP. H.M INT. DOOR FRAME SCALE: 6" = 1'-0" 8



FLOOR TRANSITIONS SCALE: 3" = 1'-0" 14

H.M. EXT. DOOR JAMB (N)WALL SCALE: 3" = 1'-0" 9

H.M. EXT. DOOR HEAD SCALE: 3" = 1'-0" 4



H.M. JAMB @ TRANSOM SCALE: 3" = 1'-0" 15

H.M. DOOR HEAD @ TRANSOM SCALE: 3" = 1'-0" 10

H.M. DOOR HEAD @ TRANSOM SCALE: 3" = 1'-0" 5

PROJECT No. :1-30-50
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SCIENCE BLDG. MODERNIZATION

DOOR DETAILS AD-6.1

3775 TENTH STREET, RIVERSIDE CALIFORNIA 92505 (951) 684-4664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92008 (619) 438-5899
 8756 MAST BOULEVARD, SANTEE, CA 92071
 GROSSMONT UNION HIGH SCHOOL DISTRICT

SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 12-29-2020

ROOM FINISH SCHEDULE

ROOM NO.	ROOM NAME	FLOOR	COLOR	MATERIAL	BASE	ELEVATION 1	COLOR	MATERIAL	FINISH	ELEVATION 2	COLOR	MATERIAL	FINISH	ELEVATION 3	COLOR	MATERIAL	FINISH	ELEVATION 4	COLOR	MATERIAL	FINISH	CEILING	COLOR	REMARKS	ROOM NO.		
1205	PHYSICS/BIOLOGY PREP	LVT	LVT-1	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	ACT	FF	ACT-1	FF	ACT-1	FF	ACT-1	1205		
1212	CHEMISTRY/BIOLOGY PREP	LVT	LVT-1	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	ACT	FF	ACT-1	FF	ACT-1	FF	ACT-1	1212		
1213	FACULTY	LVT	LVT-2	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	ACT	FF	ACT-1	FF	ACT-1	FF	ACT-1	1213		
1214	ELECT	VCT	VCT-1	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	ACT	FF	ACT-1	FF	ACT-1	FF	ACT-1	1214		
1215	STORAGE	VCT	VCT-1	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	ACT	FF	ACT-1	FF	ACT-1	FF	ACT-1	1215		
1216	CUST.	VCT	VCT-1	RB	RB-1	GWB/FRP	PSG/FF	P-1/FRP-1	GWB/FRP	PSG/FF	P-1/FRP-1	GWB	PSG	P-1	GWB	PSG	P-1	ACT	FF	ACT-1	(E)	PES	P-1	FRP @ MOP SINK WALLS ONLY, SEE DETAIL 13/AD-2.1	1216		
1217	ELECT	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	1217			
1218	PASSAGE	LVT	LVT-1	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	ACT	FF	ACT-1	FF	ACT-1	FF	ACT-1	1218		
1219	W.H.	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	(E)	1219			
1220	AV ROOM	VCT	VCT-1	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	ACT	FF	ACT-1	FF	ACT-1	FF	ACT-1	1220		
1220B	DATA ROOM	VCT	VCT-1	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	ACT	FF	ACT-1	FF	ACT-1	FF	ACT-1	1220B		
1221	FOLDING PANEL STOR.	VCT	VCT-1	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	ACT	FF	ACT-1	FF	ACT-1	FF	ACT-1	1221		
S1	BIOLOGY	LVT	LVT-1,3	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	S1
S2	PHYSICS	LVT	LVT-1,3	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	S2
S3	CHEMISTRY	LVT	LVT-1,3	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	S3
S4	CHEMISTRY	LVT	LVT-1,3	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	S4
S5	CHEMISTRY	LVT	LVT-1,3	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	S5
S6	CLASSROOM	LVT	LVT-1	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	S6	
S7	EARTH/SPACE	LVT	LVT-1,3	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	S7
S8	SCIENCE/LECTURE	CPT/LVT	CPT-1/LVT-2	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	S8	
S9	PHYSICS	LVT	LVT-1,3	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	S9
S10	BIOLOGY	LVT	LVT-1,3	RB	RB-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	GWB	PSG	P-1	GWB/TWP	PSG/FF	P-1/TWP-1	S10



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DIV. OF THE STATE ARCHITECT
APP: 04-119771 INC.
REVIEWED FOR:
DATE: 03/11/2021

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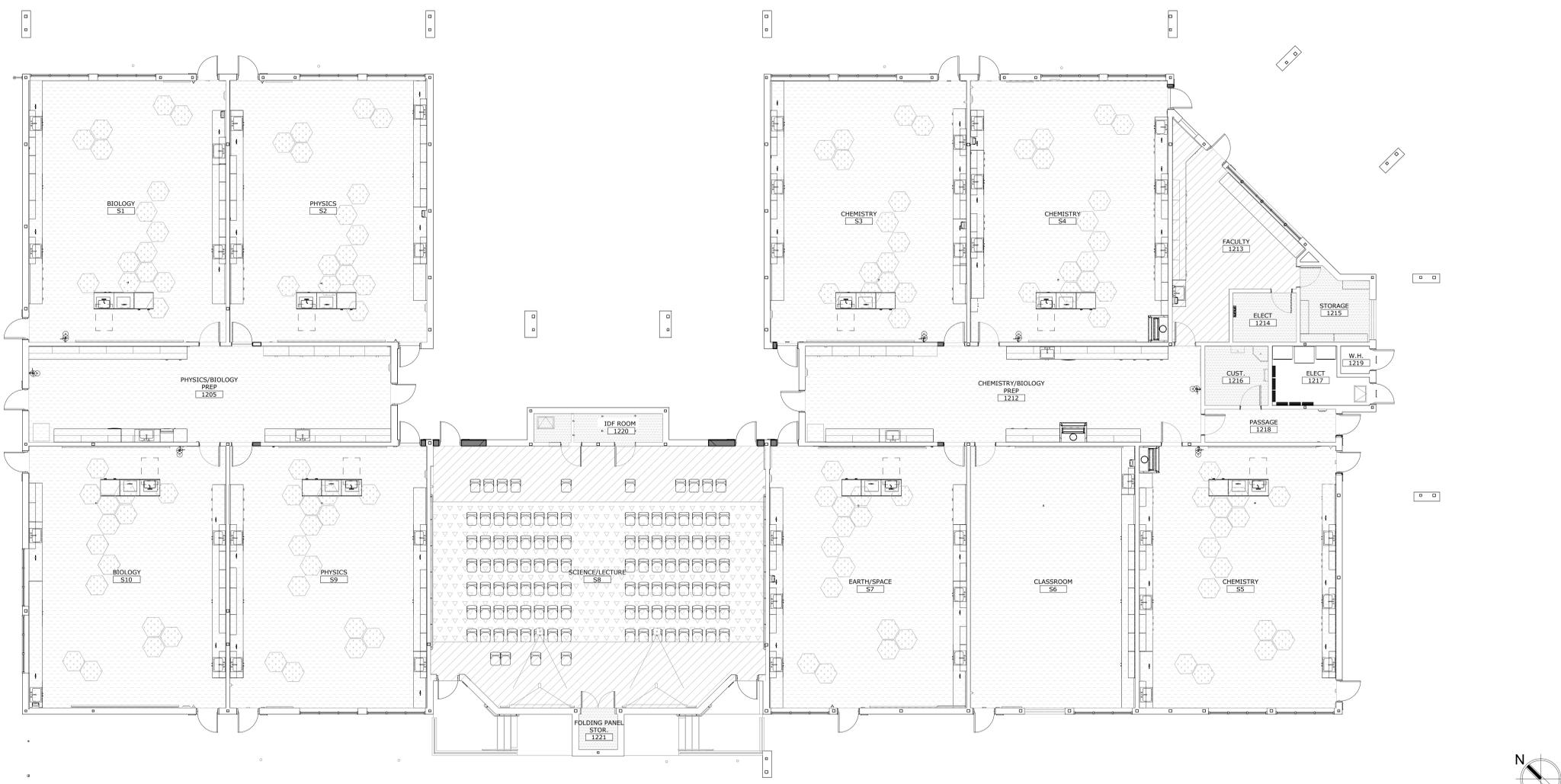
<p>ITEM</p> <p>05 41 00 - ARCHITECTURAL WOOD CASEWORK PL-1 FORMICA, "STAINLESS" #9319-BH, BRUSH FINISH PL-2 WILSONART, STANDARD HP, FINISH, "FAWN CYPRESS" #8208K-16, CASUAL RUSTIC FINISH W/ AEDN 05 82 15 - FIBERGLASS REINFORCED PANELING FRP-1 MARLITE, CLASS A, SMOOTH, STANDARD FRP 2100 S/2/S "WHITE" 09 24 00 - CEMENT PLASTERING CPL-1 OMEGA, INTEGRAL COLOR/ FINISH TO MATCH (E) CPL-2 OMEGA, INTEGRAL COLOR/ FINISH TO MATCH (E) CPL-3 OMEGA, INTEGRAL COLOR/ FINISH TO MATCH (E) 09 51 00 - ACOUSTICAL CEILING ACT-1 ARMSTRONG, SCHOOL ZONE FINE FISSURED, SQUARE LAY-IN #1714-WH, WHITE, 24"x 48"x3/4" (PANELS ONLY, EXISTING GRID TO REMAIN), NRC: 0.70 09 65 00 - RESILIENT FLOORING (LUXURY VINYL TILE) LVT-1 ARMSTRONG FLOORING, LUXURY VINYL TILE, NATURAL CREATIONS DIAMOND 10 TECHNOLOGY MYSTX, SPETTRO CUSTOM "NILE NIGHT" W/ BLUE HAWAIIAN/ BLACK TEA", 18"x36" LVT-2 PATCRAFT, RESILIENT COLLECTION, CLICK REFRESH #1600V, "HERON" #00550, 7"x48" TILE USING STAGGER INSTALLATION METHOD LVT-3 ARMSTRONG FLOORING, LUXURY VINYL TILE, NATURAL CREATIONS DIAMOND 10 TECHNOLOGY MYSTX, MIXER "BLUE HAWAIIAN" #NA623, 18"x18" 09 65 00 - RESILIENT FLOORING (RUBBER BASE) RB-1 ROPPE, 700 SERIES WALL BASE, "BURNT UMBER" #194, 4TH 09 65 00 - RESILIENT FLOORING (VINYL COMPOSITION TILE) VCT-1 ARMSTRONG FLOORING, VINYL COMPOSITION TILE, "STERLING" #51904, 12"x12" 09 68 13 - TILE CARPETING CPT-1 TARKETT, TANDUS CENTIVA, SQUAREMODULAR #04990, "BALL BLUE" #71616, 24"x24" TILE USING VERTICAL ASHLAR INSTALLATION 09 91 23 - INTERIOR PAINTING P-1 DUNN EDWARDS, DE6225 "OSSIL" P-2 DUNN EDWARDS, DE5811 "SUMMER NIGHT" P-3 SHERWIN WILLIAMS, SW9141 "WATERLOO" P-4 NOT USED P-5 DUNN EDWARDS, DE6377 "BOAT ANCHOR" P-6 DUNN EDWARDS, DE6361 "BABY SEAL"</p>	<p>LOCATION</p> <p>FACULTY - COUNTER/ BACKSPLASH FACULTY/ STORAGE - CASEWORK CUSTODIAN PORTLAND CEMENT PLASTER - TYPICAL PORTLAND CEMENT PLASTER - ACCENT PORTLAND CEMENT PLASTER - ACCENT TYPICAL CLASSROOMS/ PREP ROOMS - FIELD FACULTY/ SCIENCE/ LECTURE CLASSROOMS - ACCENT TYPICAL UTILITY SCIENCE/ LECTURE INTERIOR - TYPICAL INTERIOR - ACCENT INTERIOR - ACCENT NOT USED HM DOORS/ FRAMES INTERIOR - ACCENT/ COUNTER SUPPORT BRACKET</p>	<p>ITEM</p> <p>10 11 00 - VISUAL DISPLAY UNITS (TACKABLE WALL PANELS) TWP-1 KOROSEAL, VESCOM WALLCOVERING, AIKIN, COLOR #1068.06 10 22 39 - FOLDING PANEL PARTITIONS OP-1 ADVANCED EQUIPMENT CORPORATION, CARNEGIE XOREL, METEOR #6427 COLOR #741 12 35 53.19 - WOOD LABORATORY CASEWORK SSM-1 KEWAUNEE SCIENTIFIC, KEMRESIN, "BLACK" SSM-2 KEWAUNEE SCIENTIFIC, KEMRESIN, "GREY" CONC-1 TO MATCH (E) SC-1 TO MATCH (E)</p>
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<p>LOCATION</p> <p>CLASSROOMS SCIENCE/LECTURE CLASSROOMS - COUNTER/ BACKSPLASH PREP ROOMS - COUNTER/ BACKSPLASH CONCRETE PAVING WHERE NOTED</p>	<p>CONSTRUCTION</p> <p>CLASSROOMS - COUNTER/ BACKSPLASH PREP ROOMS - COUNTER/ BACKSPLASH CONCRETE PAVING WHERE NOTED</p>
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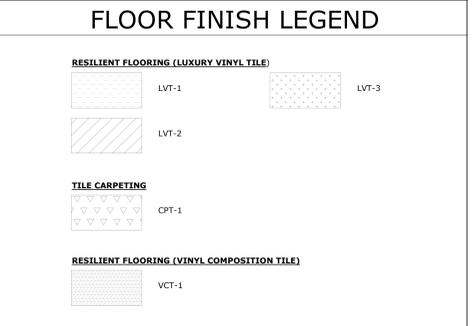
- ### FINISH NOTES
1. ALL FINISHES SHALL COMPLY WITH CBC CHAPTERS 3, 8 & 10, CFC AND CCR TITLE 19 CLASSIFICATIONS IN CBC TABLE 803.9
 2. WALL AND CEILING MATERIALS SHALL NOT EXCEED THE FLAME SPREAD
 3. SEE INTERIOR ELEVATION SHEETS FOR ACCENT PAINT LOCATIONS
 4. ALL ADJACENT DISSIMILAR FINISH MATERIALS TO RECEIVE BEAD OF CAULK, U.N.O.
 5. ALL EXPOSED STEEL, HOLLOW METAL DOORS AND FRAMES, AND LOUVERS TO BE PAINTED
 6. TOILET ROOM, TOILET ROOM VESTIBULES, AND FOOD SERVICE AREA WALLS AND CEILING NOT COVERED BY ETHER TILE OR F.P.P. TO HAVE MOISTURE RESISTANT GYP. BD., U.N.O.
 7. COORDINATE FINISHES WITH MECHANICAL FOR PLUMBING FIXTURES
 8. FOR EXTENT AND PATTERN OF CEILING FINISH, SEE REFLECTED CEILING PLAN
 9. AT COVE BASE, PROVIDE CONT. 3/8" RADIUS
 10. FOR TYPICAL FLOOR TRANSITION DETAILS, REFER TO DETAIL AD-6.1
 11. FOR MORE INFO. ON COLORS, FINISHES & MATERIALS, REFER TO SHEET ID-1.0
 12. ALL FLOOR FINISHES SHALL BE STABLE, FIRM & SLIP RESISTANT.
 13. SEE SHEET AD-6.1 FOR ALL TRANSITION DETAILS IF IT IS NOT A FLUSH TRANSITION BETWEEN ANY TWO FLOOR FINISHES.
 14. ALL FLOOR FINISHES SHALL EXTEND BELOW ACCESSIBLE WORKSTATIONS, SINKS, ETC. FOR THE REQUIRED TOE/KNEE CLEARANCE.

COLORS, MATERIALS & FINISHES LEGEND

FINISH ABBREVIATIONS



<p>ACP ACP AWP AWP COD COD CONC CONC CPT CPT CT CT DIS DIS ECO ECO EPOXY EPOXY EXP EXP FRP FRP G G GYP GYP GWB GWB GWW GWW ICB ICB LINO LINO LVT LVT MESH MESH MPS MPS OP OP PCPL PCPL PES PES PL PL PLAS PLAS PF PF PG PG PSG PSG QT QT RES RES RF RF RS RS S S SAF SAF SCW SCW SEAL SEAL SSM SSM ST ST STV STV SV SV TSRB TSRB TWP TWP U.O.S. U.O.S. VCB VCB VCT VCT VW VW VWC VWC WACP WACP WAF WAF WDM WDM WP WP WS WS</p>	<p>ACOUSTICAL CEILING PANEL (SUSPENDED) ACOUSTICAL CEILING TILE ACOUSTIC WALL PANEL CORNER GUARD CONCRETE MASONRY UNIT CONCRETE CEMENT PLASTER CARPET CERAMIC TILE DISPLAY CASE ECORESIN PANEL EPOXY FLOOR EPOXY TERRAZZO EXPOSED FACTORY FINISH FIBERGLASS REINFORCED PANEL GROUT GYPSUM PLASTER GYPSUM WALLBOARD WATER RESISTANT GWB INTEGRAL COVED BASE LINOLEUM LUXURY VINYL TILE METAL MESH SYSTEM METAL PANEL SYSTEM OPERABLE PARTITION PORTLAND CEMENT PLASTER OVER METAL LATH, SAND FINISH PAINT - EGGSHELL PLASTIC LAMINATE PLASTER PLASTER, FLAT PAINT, GLOSS PAINT, SEMI-GLOSS QUARRY TILE RESINIOUS/EPOXY FLOORING RUBBER FLOORING ROLLER SHADE SYSTEM SEAL SYNTHETIC ATHLETIC FLOORING SOLID CORE WOOD SEALED CONCRETE SOLID SURFACE MATERIAL STAIN WOOD COLOR STONE TILE VENEER SHEET VINYL TOP SET RUBBER BASE TACKABLE WALL PANEL UNDERSIDE OF STRUCTURE VENTED COVED BASE VINYL COMPOSITION TILE VINYL FABRIC VINYL WALL COVERING WASHABLE ACOUSTICAL CEILING PANEL (SUSPENDED) WOOD ATHLETE FLOORING WOOD WOOD MASSIVE FLOORING WALL PADDING WALL SYSTEM</p>
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<p>PROJECT No. :1-30-50 2/24/2021 3:22:12 PM</p>	<p>ISSUE No. DATE DESCRIPTION</p> <p>ISSUE No. DATE DESCRIPTION</p> <p>ISSUE No. DATE DESCRIPTION</p> <p>ISSUE No. DATE DESCRIPTION</p>	<p>REVISION No. DATE DESCRIPTION</p> <p>REVISION No. DATE DESCRIPTION</p> <p>REVISION No. DATE DESCRIPTION</p>
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SCIENCE BLDG. MODERNIZATION

FINISHES PLAN/
FINISH SCHEDULE &
CMF LEGEND

ID-1.0

SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 11-29-2020

LIST OF ABBREVIATIONS

ADD'L.	ADDITIONAL
ALT.	ALTERNATE
ACI	AMERICAN CONCRETE INSTITUTE
APA	AMERICAN PLYWOOD ASSOCIATION
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
A.B.	ANCHOR BOLT(S)
APPROX.	APPROXIMATELY
ARCH.	ARCHITECT / ARCHITECTURAL
⊙	AT
B. PL.	BASE PLATE
BM.	BEAM
BRC.	BEARING
BTWN.	BETWEEN
BLK.	BLOCK
BLKG.	BLOCKING
B.E.	BOTH ENDS
BOT. OR BOTT.	BOTTOM
B.N.	BOUNDARY NAILS
BLDG.	BUILDING
C	CAMBER
CBC	CALIFORNIA BUILDING CODE
CIP	CAST IN PLACE
CJ.	CEILING JOIST OR CONSTRUCTION JOINT OR CONTROL JOINT
CJP	COMPLETE JOINT PENETRATION WELD
⊕	CENTER LINE
CLR.	CLEAR
COL.	COLUMN
CONC.	CONCRETE
CMU	CONCRETE MASONRY UNIT
COND.	CONDITION
CONN.	CONNECTION
CONSTR.	CONSTRUCTION
CONT'D	CONTINUED
CONT.	CONTINUOUS
CONTR.	CONTRACTOR
CSK.	COUNTERSINK
DL	DEAD LOAD
DP	DEEP
DEMO.	DEMOLISH
DTL. OR DET.	DETAIL
DIAG.	DIAGONAL
DIA. OR ⌀	DIAMETER
DIM.	DIMENSION
DO	DITTO
DBL	DOUBLE
D.F.	DOUGLAS FIR
DWL	DOWEL
DN	DOWN
DWG.	DRAWING
EA	EACH
E.F.	EACH FACE
E.S.	EACH SIDE
E.W.	EACH WAY
E.N.	EDGE NAIL(S)
ELEC.	ELECTRICAL
ELEV.	ELEVATION
EMBED.	EMBEDMENT
ENG.	ENGINEER
EQ	EQUAL
EQUIP.	EQUIPMENT
EXCAV.	EXCAVATION
(E)	EXISTING
EXP.	EXPANSION
EU	EXPANSION JOINT
ES	EVALUATION SERVICE
ESSR	EVALUATION SERVICE REPORT
EXT.	EXTERIOR
F.O.C.	FACE OF CONCRETE
F.O.M.	FACE OF MASONRY
F.O.S.	FACE OF STUD OR FACE OF SLAB
F.S.	FAR SIDE
FIN.	FINISH
F.F.	FINISHED FLOOR
FHWS	FLAT HEAD WOOD SCREW
FLR.	FLOOR
FD	FLOOR DRAIN
FTG.	FOOTING
FUND.	FOUNDATION
FRMG.	FRAMING
GALV.	GALVANIZE
GA	GAUGE
GLU-LAM	GLUED LAMINATED
GLB	GLUED LAMINATED BEAM
GR.	GRADE
HGR.	HANGER
HDR.	HARDROCK
HDR.	HEADER
HT.	HEIGHT
HD	HOLD DOWN
HSS	HOLLOW STRUCTURAL SECTION
HORIZ.	HORIZONTAL
INFO.	INFORMATION
I.D.	INSIDE DIAMETER
INT.	INTERIOR
IBC	INTERNATIONAL BUILDING CODE
ICC	INTERNATIONAL CODE COUNCIL
INV.	INVERT
JST.	JOIST
KP	KING POST
KSI	KIPS PER SQUARE INCH
LAM.	LAMINATED
LDGR.	LEDGER
LT. WT. OR LW	LIGHT WEIGHT
LL	LONG OR LENGTH
LG.	LONG LEG HORIZONTAL
LLH	LONG LEG VERTICAL
LLV	LONG LEG VERTICAL
LO-HY	LOW HYDROGEN
M.B.	MACHINE BOLT(S)
MFR.	MANUFACTURER
MAS.	MASONRY
M.O.	MASONRY OPENING
MATL.	MATERIAL
MAX.	MAXIMUM
MECH.	MECHANICAL
MTL.	METAL
MIN.	MINIMUM
MISC.	MISCELLANEOUS
MU	MECHANICAL UNIT
N.F.	NEAR FACE
N.S.	NEAR SIDE
NSA	NELSON STUD ANCHOR
(N)	NEW
NIC.	NOT IN CONTRACT
NTS.	NOT TO SCALE
NO. OR #	NUMBER
O.C.	ON CENTER
OPNG.	OPENING
OPP.	OPPOSITE
O.H.	OPPOSITE HAND
O.D.	OUTSIDE DIAMETER
PHWS	PAN HEAD WOOD SCREW
P.J.	PANEL JOINT
P.	PENNY
PL.	PLASTER
PL. OR Ⓟ	PLATE (STEEL OR WOOD)
PLY.	PLYWOOD
PWJ	PLYWOOD WEB JOIST
PCF	POUNDS PER CUBIC FOOT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PTD	PRESSURE TREATED
PTDF	PRESSURE TREATED DOUGLAS FIR
PL	PROPERTY LINE
RAD.	RADIUS
RFTR.	RAFTER
REF.	REFERENCE
REINP.	REINFORCING
REQ'D	REQUIRED
REQMT.	REQUIREMENT
RF.	ROOF
R.D.	ROOF DRAIN

LIST OF ABBREVIATIONS (CONT'D)

RO.	ROUGH
R.O.	ROUGH OPENING
SCHED.	SCHEDULE
SEC.	SECTION
SEL.	SELECTION
SEP.	SEPARATION
SFRS.	STRUCTURAL FORCE RESISTING SYSTEM
SHTG.	SHEATHING
SHT.	SHEET
S.M.	SHEET METAL
SMS	SHEET METAL SCREWS
SIM.	SIMILAR
SIMP.	SIMPSON
SPPC.	SPECIFICATION
SPECS.	SPECIFICATIONS
SO.	SQUARE
STGR.	STAGGER
S.S.	STAINLESS STEEL
SPC	STANDARD PIPE COLUMN
STD.	STANDARD
STL.	STEEL
STIFF.	STIFFENER
STIRR.	STIRRUP
STRUCT.	STRUCTURAL
SYM.	SYMMETRICAL
TSG	TAPERED STEEL GIRDER
THK.	THICK
K OR KIP	1,000 POUNDS
THRU	THROUGH
TN	TOE NAIL
T&G	TONGUE AND GROOVE
T&B	TOP AND BOTTOM
T.O.F.	TOP OF FOOTING
T.O.L.	TOP OF LEDGER
T.O.S.	TOP OF STEEL OR TOP OF SHEATHING
T.O.W.	TOP OF WALL
TL	TOTAL LOAD
TS	TUBE STEEL
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VIF	VERIFY IN FIELD
VERT.	VERTICAL
WT.	WEIGHT
WVF	WELDED WIRE FABRIC
W/	WITH
W/O	WITHOUT
WD	WOOD
WJ	WOOD—JOIST
WP	WORK POINT
W.S.	WOOD SCREW

GENERAL

- THESE STRUCTURAL DRAWINGS AND SPECIFICATIONS, INCLUDING ANY ADDENDA (COLLECTIVELY "THE PLANS") INCORPORATE ALL LEGAL AND INDUSTRY REQUIREMENTS AND STANDARDS INCLUDING WITHOUT LIMITATION THE FOLLOWING:
 - THE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 1 (CALIFORNIA ADMINISTRATIVE CODE), 2019 EDITION.
 - THE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 2 (CALIFORNIA BUILDING CODE), 2019 EDITION.
 - OTHER REGULATING AGENCIES WHICH MAY HAVE AUTHORITY OVER ANY PORTION OF THE WORK, INCLUDING THE STATE OF CALIFORNIA DIVISION OF INDUSTRIAL SAFETY, AND THOSE CODES AND STANDARDS LISTED IN THESE NOTES AND SPECIFICATIONS.
 - THE FUNCTIONALITY STANDARDS SET FORTH IN TITLE 7 OF THE CALIFORNIA CIVIL CODE (THE "RIGHT TO REPAIR ACT").
 - THE MANUFACTURER'S REQUIREMENTS OR RECOMMENDATIONS FOR ANY INCORPORATED PRODUCTS.
 - THE MOST CURRENT APPROVED ISSUES OF ANY NOTED SPECIFICATIONS, CODES AND STANDARDS, INCLUDING SUPPLEMENTS, UNLESS NOTED OTHERWISE.
- THE PLANS REPRESENT ONLY THE FINISHED STRUCTURE, AND THEY ARE NOT INTENDED TO INDICATE OR REQUIRE ANY CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES. IN PARTICULAR AND WITHOUT LIMITATION, THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR ANY AND ALL EXCAVATION, DEMOLITION, SHORING AND ERECTION PROCEDURES AND FOR ANY AND ALL SAFETY PROGRAMS AND PRECAUTIONS.
- IN USING THE PLANS FOR BIDDING OR CONSTRUCTION PURPOSES, THE CONTRACTOR IS REQUIRED TO REVIEW ALL OF THE PROJECT'S CONSTRUCTION DOCUMENTS AS A WHOLE IN ORDER TO IDENTIFY ALL REQUIREMENTS THAT DIRECTLY OR INDIRECTLY AFFECT ITS PORTION OF THE STRUCTURAL WORK, EVEN REQUIREMENTS LOCATED IN SECTIONS DESIGNATED AS APPLICABLE TO OTHER TRADES. IN CASE OF CONFLICTS, THE CONTRACTOR SHALL EITHER OBTAIN DIRECTION FROM AN APPROPRIATE OWNER REPRESENTATIVE OR OTHERWISE APPLY THE MORE STRINGENT REQUIREMENT.
- IN INTERPRETING THE PLANS, THE FOLLOWING GENERAL RULES APPLY:
 - WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DRAWINGS.
 - SPECIFIC NOTES AND DETAILS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
 - WORK NOT PARTICULARLY SHOWN OR SPECIFIED SHALL BE THE SAME AS SIMILAR PARTS THAT ARE SHOWN OR SPECIFIED.
 - SCALED DIMENSIONS AND GRAPHICALLY SHOWN LOCATIONS ARE TO BE CONSIDERED ONLY APPROXIMATE.
- IN IMPLEMENTING THE PLANS, THE FOLLOWING GENERAL RULES APPLY:
 - BECAUSE THE PLANS ARE INTENDED TO SET FORTH THE REQUIREMENTS FOR CONSTRUCTION IN ONLY AN INDUSTRY-STANDARD LEVEL OF QUALITY AND DETAIL, AND THEREFORE ARE INTENDED TO BE SUPPLEMENTED BY APPROPRIATE REQUESTS FOR CLARIFICATION AND INFORMATION, ERRORS AND OMISSIONS ARE TO BE EXPECTED AND ANTICIPATED; AND THE CONTRACTOR IS REQUIRED TO CAREFULLY REVIEW THE PLANS FOR ERRORS AND OMISSIONS AND TO BRING THESE ERRORS AND OMISSIONS TO THE ATTENTION OF AN APPROPRIATE OWNER REPRESENTATIVE IN A TIMELY MANNER AND ASSUMES THE RISK OF THE CONSEQUENCES OF FAILING TO DO SO BEFORE BIDDING OR OTHERWISE PROCEEDING.
 - THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS PRIOR TO STARTING CONSTRUCTION, AND NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES OR INCONSISTENCIES.
- SUBMITTALS WILL BE REVIEWED BY THE STRUCTURAL ENGINEER, IF AT ALL, ONLY PURSUANT TO THE INDUSTRY-STANDARD PROTOCOL SET FORTH IN IIA DOCUMENT A201, AND IN NO EVENT WILL THE SUBMITTAL REVIEW PROCESS RELIEVE OR LESSEN THE SUBMITTING CONTRACTOR'S RESPONSIBILITY FOR AN INAPPROPRIATE SUBMITTAL.
- IN NO EVENT WILL ANY SITE VISITS BY THE STRUCTURAL ENGINEER CONCERN CONSTRUCTION MEANS AND METHODS OR CONSTRUCTION SAFETY, AND ALL SUCH MATTERS SHALL REMAIN THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- COPIES OF THE PLANS PROVIDED IN ANY ELECTRONIC FORM ARE SUBJECT TO THE SAME PROVISIONS AS THE OTHER INSTRUMENTS OF SERVICE PREPARED BY OR ON BEHALF OF STRUCTURAL ENGINEER FOR THE PROJECT, INCLUDING WITHOUT LIMITATION THE ENGINEER'S COMMON LAW, STATUTORY OR OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS. A RECIPIENT IS GRANTED AT MOST A TRANSFERABLE NONEXCLUSIVE LICENSE TO REUSE THE PLANS SOLELY FOR PROJECT PURPOSES; AND NO RECIPIENT IS AUTHORIZED TO USE OR TO ALLOW THE USE OF ALL OR ANY PORTION OF THESE PLANS FOR ANY OTHER PURPOSE, AND ANY USE FOR ANY OTHER PURPOSE WOULD CONSTITUTE ACTIONABLE PLAGIARISM. STRUCTURAL ENGINEER PROVIDES DOCUMENTS IN AN ELECTRONIC FORM ONLY IN ITS STANDARD FORMATS AND CONVENTIONS AND WITH NO GUARANTEE OF COMPATIBILITY WITH ANY RECIPIENT'S SOFTWARE OR HARDWARE, AND ANY USE WITH OR CONVERSION TO OTHER FORMATS OR CONVENTIONS, OR THE USE WITH ANY PARTICULAR SOFTWARE OR HARDWARE, IS AT THE RECIPIENT'S SOLE RISK.

PROJECT DESIGN CRITERIA

- BASIC DESIGN LIVE LOADS:
ROOF: 20 PSF (REDUCIBLE)
- WIND LOADS
RISK CATEGORY: III
EXPOSURE CATEGORY: C
ULTIMATE DESIGN WIND SPEED (3-SECOND GUST), $V_{ult} = 103$ MPH
NOMINAL DESIGN WIND SPEED, $V_{50} = 80$ MPH
VELOCITY PRESSURE EXPOSURE COEFFICIENT, $K_z = 0.85$ (0-15 FT)
TOPOGRAPHIC FACTOR, $K_{zt} = 1.0$
WIND DIRECTIONALITY FACTOR, $K_d = 0.85$
GROUND ELEVATION FACTOR, $K_e = 1.00$
A. MWFRS – DIRECTIONAL PROCEDURE (ASCE 7-16, CH. 27 PART 1)
 $q_z = 0.00256 K_z K_{zt} K_d V_{ult}^2 = 19.6$ PSF
 $P = qG_o - q(GC_p)$
GUST EFFECT FACTOR, $G = 0.85$
EXTERNAL PRESSURE COEFFICIENT, $C_p = [Fig. 27.4-1 THRU 27.4-3]$
INTERNAL PRESSURE COEFFICIENT, $(GC_{pi}) = TABLE 26.13-1$
- EARTHQUAKE LOADS
SEISMIC DESIGN CRITERIA
 $S_s = 0.781$
 $S_1 = 0.287$
SITE CLASS: D-DEFAULT
 $F_a = 1.2$
 $F_v = 1.7$
 $S_{ps} = 0.625$
 $S_{pi} = 0.325$
RISK CATEGORY: III
SEISMIC DESIGN CATEGORY: D
SEISMIC DESIGN REQUIREMENTS
DESIGN BASE SHEAR $V = C_w W$
WHERE:
 C_w SHALL NOT BE LESS THAN
BUT NEED NOT EXCEED
 $V = C_w W$
 $C_w = S_{ps}/(R/I_e)$
 $C_w = 0.045 S_{ps} I_e > 0.01$
 $C_w = S_{pi}/[I_e(R/I_e)]$
 $R = 6.5$
 $I_e = 3.0$
 $T = 0.189$
 $I_e = 1.25$
 $C_w = 0.120$
(2) PRIMARY LATERAL FORCE RESISTING SYSTEM: LIGHT-FRAMED WALLS SHEATHED WITH WOOD STRUCTURAL PANELS RATED FOR SHEAR (ASCE 7-16, TABLE 12.2-1, ITEM A.15.)
ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE PROCEDURE
LOCATION OF BASE: TOP OF FOOTINGS
STRUCTURAL IRREGULARITIES: NONE

EXISTING CONDITIONS

- ALL INFORMATION SHOWN ON THE PLANS RELATIVE TO EXISTING CONDITIONS IS GIVEN AS THE BEST PRESENT KNOWLEDGE FROM PLANS SUPPLIED BY THE OWNER, BUT WITHOUT GUARANTEE OF ACCURACY.
- WHERE ACTUAL CONDITIONS ARE NOT IN ACCORDANCE WITH THE INFORMATION PRESENTED, THE ARCHITECT SHALL BE NOTIFIED IMMEDIATELY. NO MODIFICATIONS OF THE PLANS FOR NEW CONSTRUCTION SHALL BE MADE WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT.

EXISTING UNDERGROUND UTILITIES

- THE ARCHITECT AND ENGINEERS ARE NOT RESPONSIBLE FOR THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES WHETHER OR NOT SHOWN ON THE DRAWINGS. THE LOCATION OF ANY EXISTING UNDERGROUND UTILITIES SHOWN ON THE DRAWINGS, IF ANY, IS APPROXIMATE. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN EXCAVATING AND TRENCHING ON THE SITE. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT SHOULD ANY SUCH UNIDENTIFIED CONDITIONS BE DISCOVERED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES WHICH MAY RESULT FROM HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ALL EXISTING UNDERGROUND UTILITIES.

DEMOLITION

- ALL DEMOLITION SHALL BE CARRIED ON IN SUCH A WAY AS NOT TO DAMAGE EXISTING ELEMENTS, WHICH ARE TO REMAIN IN THE FINISHED STRUCTURE.
- ALL ELEMENTS OF THE STRUCTURE, WHICH ARE TO REMAIN, AND WHICH ARE DAMAGED DURING DEMOLITION WORK SHALL BE REPLACED AT NO ADDITIONAL COST. EXISTING ELEMENTS SHALL BE PROTECTED TO THE FULLEST EXTENT POSSIBLE, IN ORDER TO MITIGATE DAMAGE.
- CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF ALL EXISTING ELEMENTS THAT ARE NECESSARY FOR THE INSTALLATION OF ALL NEW WORK.
- DO NOT CORE OR CUT NEW OPENINGS IN EXISTING CONCRETE OR MASONRY WITHOUT SPECIFIC APPROVAL OF THE STRUCTURAL ENGINEER. SUBMIT DIMENSIONED LAYOUT OF ALL PROPOSED NEW OPENINGS TO ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO CORING OR CUTTING OPENINGS. CONTRACTOR, AT HIS OWN EXPENSE, SHALL USE NON-DESTRUCTIVE METHODS TO LOCATE EXISTING REINFORCING. EXISTING REINFORCING SHALL NOT BE CUT WITHOUT SPECIFIC APPROVAL OF THE STRUCTURAL ENGINEER.

REINFORCING STEEL

- ALL PORTIONS OF WORK PERTAINING TO FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL CONFORM TO TITLE 24, PART 2, CHAPTER 19A.
- REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60, EXCEPT #3 BARS MAY BE GRADE 40. REINFORCING BARS THAT ARE TO BE WELDED SHALL CONFORM TO ASTM A-706, GRADE 60.
- WELDING OF REINFORCEMENT SHALL BE WITH LOW HYDROGEN ELECTRODES AND SHALL CONFORM TO STRUCTURAL WELDING CODE – REINFORCING STEEL, AWS D14, BY THE AMERICAN WELDING SOCIETY AND SEC. 1903A.8, WELDING RODS USED FOR THE WELDING OF REINFORCING SHALL BE E80XX. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS.
- ALL REINFORCING BAR BENDS SHALL BE MADE COLD. ALL #5 OR LARGER REINFORCING BARS SHALL NOT BE RE-BENT.
- FUSION WELDED REINFORCING STEEL ASSEMBLIES SHALL CONFORM TO SEC. 1903A.8, TIES/STIRRUP BARS IN FUSION WELDED ASSEMBLIES SHALL CONFORM TO ASTM A-706, AND LONGITUDINAL HOLDING WIRES SHALL CONFORM TO ASTM A-1064.
- WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185, AND SHALL BE LAPPED $1/2$ SPACES AND $12"$ MINIMUM.
- DOWELS BETWEEN FOOTINGS AND WALLS OR COLUMNS SHALL BE THE SAME GRADE, SIZE, SPACING AND NUMBER AS THE VERTICAL REINFORCEMENT, RESPECTIVELY.
- REINFORCING SPLICES SHALL BE MADE AS INDICATED ON THE DRAWINGS.

STAMPS

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT

APP: 04-119771 INC.
REVIEWED FOR

SS FLS ACS

DATE: 03/11/2021

KNA STRUCTURAL ENGINEERS
9931 Muirlands Boulevard, Irvine, CA 92618
www.KNAstructural.com

KNA JOB NO: 203-600
CONSULTANT BRANDING

RUHNAU CLARKE ARCHITECTS

CONCRETE

- ALL PORTIONS OF WORK PERTAINING TO CONCRETE CONSTRUCTION SHALL CONFORM TO TITLE 24, PART 2, CHAPTER 19A.
- CONCRETE MIXES SHALL BE DESIGNED BY A QUALIFIED TESTING LABORATORY. MIX DESIGNS SHALL CONFORM TO ACI 318, SEC. 26.4, CBC SEC.1903A AND 1904A. MIX DESIGNS SHALL INCORPORATE THE FOLLOWING CRITERIA:
 - MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD OF CONCRETE. MAXIMUM OF 7 SACKS OF CEMENT PER YARD OF CONCRETE.
 - MAXIMUM WATER/CEMENT RATIO (BY WEIGHT) OF CONCRETE IN CONTACT WITH SOIL SHALL BE 0.45.
 - MAXIMUM SLUMP SHALL NOT EXCEED 3' ± 1" FOR FOOTINGS, SLABS ON GRADE, AND MASS CONCRETE; AND 4' ± 1" FOR OTHER CONCRETE. SLUMP LIMITATIONS NOTED SHALL APPLY TO CONCRETE MIX PRIOR TO THE ADDITION OF ANY WATER-REDUCING ADMIXTURES OR SUPER-PLASTICIZERS. MAXIMUM SLUMP MAY BE INCREASED TO 5 +/- 1" FOR MIX INCLUDING WATER-REDUCING ADMIXTURES OR SUPER-PLASTICIZERS.
 - CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CHLORIDE(S) SHALL NOT BE USED.
- SCHEDULE OF STRUCTURAL CONCRETE 28 DAY MINIMUM STRENGTHS AND TYPES:

FOOTINGS, CAISSONS, GRADE BEAMS	145 PCF, $f'_c = 4500$ PSI
SLABS ON GRADE	145 PCF, $f'_c = 4500$ PSI
ELSEWHERE UNLESS NOTED	145 PCF, $f'_c = 4500$ PSI
- PORTLAND CEMENT SHALL CONFORM TO ASTM C-150, TYPE II. CEMENT USED FOR CONCRETE IN CONTACT WITH SOIL SHALL CONFORM TO ASTM C-150, TYPE V.
- AGGREGATE FOR NORMALWEIGHT CONCRETE SHALL CONFORM TO ASTM C-33. COMBINED AGGREGATE GRADATION OF $3/8"$ MAXIMUM (PEA GRAVEL) SHALL NOT BE USED.
- READY MIXED CONCRETE SHALL CONFORM TO ASTM C-94.
- PLACEMENT OF CONCRETE SHALL CONFORM TO ACI 304. CLEAN AND ROUGHEN TO $1/4"$ AMPLITUDE ALL CONCRETE SURFACES AGAINST WHICH CONCRETE IS TO BE PLACED.
- ALL REINFORCING BARS, ANCHOR BOLTS AND OTHER CONCRETE INSERTS SHALL BE SECURED IN POSITION PRIOR TO PLACING CONCRETE.
- PROVIDE "SLEEVES" FOR PLUMBING AND ELECTRICAL OPENINGS IN CONCRETE BEFORE PLACING. DO NOT CUT ANY REINFORCING WHICH MAY CONFLICT. CORING IN CONCRETE IS NOT PERMITTED EXCEPT AS SHOWN. NOTIFY THE STRUCTURAL ENGINEER, IN ADVANCE, OF CONDITIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS.
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCEMENT:
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
CONCRETE EXPOSED TO EARTH OR WEATHER:
#6 THROUGH #18 BARS 2"
#5 BARS, W31 OR D31 WIRE, AND SMALLER 1 1/2"
- CONDUITS OR PIPES SHALL NOT BE EMBEDDED WITHIN A SLAB, WALL, BEAM, OR COLUMN, UNLESS SPECIFICALLY DETAILED.
- SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ALL MOLDS, GROOVES, REVEALS, ORNAMENTS AND GROUNDS TO BE CAST IN CONCRETE.
- DRYPACK WHERE NOTED ON DRAWINGS SHALL CONSIST OF 1 PART PORTLAND CEMENT AND $2 1/2$ PARTS OF FINE AGGREGATE CONFORMING TO ASTM C-33 WITH ENOUGH WATER TO FORM A BALL WHEN SQUEEZED IN THE HAND. THE SPACE BETWEEN TWO SURFACES REQUIRING DRYPACK SHALL BE PACKED WITH THE DRYPACK MATERIAL BY TAMPING OR RAMMING WITH A BAR OR ROD UNTIL THE VOIDS ARE COMPLETELY FILLED.
- NON-SHRINK GROUT WHERE NOTED ON DRAWINGS SHALL BE A PRE-MIXED COMPOUND CONSISTING OF NON-METALLIC AGGREGATE, CEMENT, WATER REDUCING AND PLASTICIZING ADDITIVES, CAPABLE OF DEVELOPING A MINIMUM COMPRESSIVE STRENGTH OF 8,000 PSI AT 28 DAYS. WHERE APPLICATION THICKNESS EXCEEDS MANUFACTURER'S LIMITATIONS, EXTEND WITH $3/8"$ (GRAVEL) AGGREGATE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- IF APPROVED BY DIVISION OF THE STATE ARCHITECT, BATCH PLANT INSPECTION MAY BE REDUCED TO PERIODIC SUBJECT TO THE REQUIREMENTS OF CBC SEC. 1705A.3.3.1.

PROJECT No. : 2/16/2021 12:58 PM

DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION

RUHNAUCLARKE.COM

3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684-6664 / 3751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92008 (760) 438-5999

SCIENCE BLDG. MODERNIZATION

GENERAL NOTES

S0-1.1

WEST HILLS HIGH SCHOOL
8756 MAST BOULEVARD, SANTEE, CA 92071
GROSSMONT UNION HIGH SCHOOL DISTRICT

X-8X-8X

WOOD

- ALL PORTIONS OF WORK PERTAINING TO WOOD CONSTRUCTION SHALL CONFORM TO TITLE 24, PART 2, CHAPTER 23, INCLUDING ADDITIONAL REQUIREMENTS AND EXCEPTIONS, AS APPLICABLE.
- LUMBER SHALL BE GRADED IN ACCORDANCE WITH THE STANDARD GRADING RULES NO. 17 OF THE WEST COAST LUMBER INSPECTION BUREAU, OR THE STANDARD GRADING RULES OF THE WESTERN WOOD PRODUCTS ASSOCIATION.
- DIMENSION LUMBER SHALL BE DOUGLAS FIR-LARCH, NO. 1 AND BETTER GRADE, UNLESS NOTED OTHERWISE. TIMBERS SHALL BE DOUGLAS FIR LARCH, NO. 1 GRADE, UNLESS NOTED OTHERWISE. MOISTURE CONTENT AT TIME OF INSTALLATION SHALL BE 19% OR LESS.
- ALL PLYWOOD SHALL BE STRUCTURAL 1 AND COMPLY WITH PRODUCT STANDARD PS-1. USE PLYWOOD NAILS SAME GAUGE AS COMMON WIRE NAILS WITH LENGTHS AT LEAST EQUAL TO PLYWOOD THICKNESS PLUS REQUIRED PENETRATION IN ACCORDANCE WITH SECTIONS 2306.2 (AWC SDPWS TABLE 4.2A) OR 2306.3 (AWC SDPWS TABLE 4.3A), AS APPLICABLE.
- EXPOSED MEMBERS SHALL BE SELECT STRUCTURAL GRADE, FREE OF HEART CENTER (WHERE SIZE PERMITS), AND SELECTED FOR APPEARANCE AND STRAIGHTNESS.
- BOLT HOLES SHALL BE A MINIMUM OF $\frac{1}{16}$ " TO A MAXIMUM OF $\frac{1}{8}$ " LARGER DIAMETER THAN NOMINAL SIZE OF BOLT USED. RETIGHTEN ALL NUTS PRIOR TO CLOSING IN.
- STANDARD CUT WASHERS SHALL BE USED UNDER BOLT HEADS AND NUTS AGAINST WOOD. USE HEAVY PLATE OR MALLEABLE IRON WASHERS WHERE NOTED.
- DO NOT BORE OR NOTCH MEMBERS, EXCEPT WHERE SHOWN IN DETAILS. OBTAIN ENFORCEMENT AGENCY AND STRUCTURAL ENGINEER'S APPROVAL FOR ANY HOLES OR NOTCHES NOT DETAILED.
- METAL CONNECTORS FOR WOOD CONSTRUCTION SHALL BE SIMPSON "STRONG-TIE", KC METALS, OR APPROVED EQUAL, UNLESS NOTED OTHERWISE. PRODUCT CALLOUT ON PLANS REFERS TO SIMPSON "STRONG-TIE" MODEL NUMBER AND KC METALS PRODUCT REFERENCE NUMBER, FILL ALL ROUND AND TRIANGLE HOLES WITH THE SPECIFIED NAILS. APPROVED EQUALS MAY ONLY BE USED WITH PRIOR APPROVAL FROM ENFORCEMENT AGENCY AND THE STRUCTURAL ENGINEER.
- ALL SILL PLATES WHICH REST ON FOUNDATION OR SLAB ON GRADE SHALL BE PRESERVATIVE-TREATED IN ACCORDANCE WITH SEC. 2303.1.9, AND SHALL BEAR THE QUALITY MARK OF AN APPROVED INSPECTION AGENCY THAT MAINTAINS CONTINUING SUPERVISION, TESTING AND INSPECTION OVER THE QUALITY OF PRESERVATIVE-TREATED WOOD. CUTS AND HOLES SHALL BE RETREATED.
- JOISTS MORE THAN 8-INCH DEPTH SHALL BE CONTINUOUSLY BRIDGED BY SOLID BLOCKING, 2 INCHES THICK AND THE FULL DEPTH OF THE JOIST, SPACED AT 8 FEET ON CENTER.
- ALL NAILING SHALL CONFORM TO TABLE 2304.10.1 - FASTENING SCHEDULE, USING COMMON WIRE NAILS. PREDRILL ALL NAILS 200 AND LARGER AND WHERE REQUIRED TO PREVENT SPLITTING, FASTENERS IN CONTACT WITH PRESERVATIVE-TREATED WOOD SHALL BE OF HOT-DIPPED ZINC-COATED GALVANIZED STEEL.
- LAG SCREWS SHALL HAVE LEAD HOLES BORED BEFORE INSTALLING. HOLE DIAMETERS SHALL BE AS FOLLOWS:
 - SHANK PORTION SAME DIAMETER AND LENGTH OF SHANK
 - THREAD PORTION 0.40 TO 0.70 DIAMETER OF THREAD AND SAME LENGTH

POWDER DRIVEN CONCRETE FASTENERS

- THE USE OF POWDER DRIVEN FASTENERS FOR TENSION LOADS IS LIMITED TO SUPPORT OF MINOR LOADS, SUCH AS ACoustICAL CEILINGS, DUCTWORK, CONDUIT, ETC. POWDER DRIVEN CONCRETE FASTENERS MAY NOT BE USED IN CURBS.
- ALLOWABLE TENSION LOADS SHALL BE LIMITED TO 100 POUNDS, OR 80% OF ICC APPROVED VALUES, WHICHEVER IS LESS. QUALIFICATION FOR USE OF ALL POWER ACTUATED TOOLS MUST MEET ANSI A10.3 STANDARD AS REQUIRED BY THE MANUFACTURER AND ALL OSHA REQUIREMENTS.
- THE OPERATOR, TOOL, AND FASTENERS SHALL BE PREQUALIFIED BY THE PROJECT INSPECTOR. HE SHALL OBSERVE THE TESTING OF THE FIRST TEN FASTENER INSTALLATIONS. A "PULL-OUT" TEST LOAD OF 200 LBS. SHALL BE APPLIED TO THE PIN IN SUCH A MANNER AS NOT TO RESIST THE SPALLING TENDENCY OF THE CONCRETE SURROUNDING THE PIN. THEREAFTER, RANDOM TESTS, UNDER THE PROJECT INSPECTOR'S SUPERVISION, SHALL BE MADE OF APPROXIMATELY ONE IN TEN PINS. IF ANY PIN FAILS TESTING, TEST ALL PINS OF THE SAME CATEGORY NOT PREVIOUSLY TESTED UNTIL TWENTY CONSECUTIVE PASS, THEN RESUME THE INITIAL TESTING FREQUENCY.
- FASTENERS SHALL HAVE ICC APPROVAL FOR THE TYPE OF CONCRETE INTO WHICH THE FASTENERS ARE INSTALLED.
- POWDER DRIVEN CONCRETE FASTENERS ARE NOT PERMITTED IN PRESTRESSED CONCRETE MEMBERS.
- WHEN INSTALLING DRILLED-IN ANCHORS AND/OR POWDER DRIVEN PINS IN NON-PRESTRESSED REINFORCED CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGE TO THE REINFORCING BARS. MAINTAIN A MINIMUM CLEARANCE OF ONE INCH BETWEEN THE REINFORCEMENT AND DRILLED-IN ANCHOR AND/OR PIN.

POST-INSTALLED ANCHORS

- ACCEPTABLE EQUIVALENT MANUFACTURERS OF POST-INSTALLED EXPANSION ANCHORS AND SCREW ANCHORS SHALL BE HILTI INC., SIMPSON STRONG-TIE COMPANY INC., OR DEWALT, UNO.
- TESTS FOR POST-INSTALLED ANCHORS IN HARDENED CONCRETE SHALL CONFORM TO TITLE 24, PART 2, CHAPTER 19A, SECTION 1910A.5.
- POST-INSTALLED ANCHOR INSTALLATION SHALL BE INSPECTED BY A SPECIAL INSPECTOR SPECIFICALLY APPROVED BY THE ENFORCEMENT AGENCY FOR THAT PURPOSE.
- POST-INSTALLED ANCHOR TESTING SHALL BE DONE IN THE PRESENCE OF THE PROJECT INSPECTOR.
- TEST QUANTITY OF POST-INSTALLED ANCHORS AS NOTED BELOW:

APPLICATION	QUANTITY
SILL PLATES	10% OF BOLTS
STRUCTURAL	100% OF BOLTS
NON-STRUCTURAL (EQUIP. ANCHORAGE, ETC.)	50% OF BOLTS
- IF ANY ANCHOR FAILS TESTING, TEST ALL ANCHORS OF THE SAME CATEGORY NOT PREVIOUSLY TESTED UNTIL TWENTY (20) CONSECUTIVE ANCHORS PASS, THEN RESUME INITIAL TESTING FREQUENCY.
- TORQUE TESTING SHALL BE APPLIED BY CALIBRATED WRENCH. TENSION TESTING (WHERE INDICATED) SHALL BE APPLIED BY HYDRAULIC JACK OR CALIBRATED SPRING LOADING DEVICE.
- THE FOLLOWING CRITERIA SHALL APPLY FOR THE ACCEPTANCE OF INSTALLED POST-INSTALLED ANCHORS:
 - TORQUE WRENCH METHOD: THE APPLICABLE TEST TORQUE MUST BE ATTAINED WITHIN ONE-HALF ($\frac{1}{2}$) TURN OF THE NUT. SLEEVE ANCHORS $\frac{3}{8}$ INCH DIAMETER OR LESS MUST ATTAIN THE SPECIFIED TEST TORQUE WITHIN ONE-QUARTER ($\frac{1}{4}$) TURN OF THE NUT, AND THREADED ANCHORS MUST ATTAIN THE SPECIFIED TEST TORQUE WITHIN ONE-QUARTER ($\frac{1}{4}$) TURN OF THE SCREW AFTER INITIAL SEATING OF THE SCREW HEAD.
 - HYDRAULIC RAM METHOD: (FOR TENSION TESTING WHERE INDICATED) ANCHORS SHALL MAINTAIN THE TENSION TEST LOAD FOR A MINIMUM OF 15 SECONDS AND SHALL EXHIBIT NO DISCERNABLE MOVEMENT DURING THE TENSION TEST. (AN EXAMPLE OF DISCERNABLE MOVEMENT WOULD BE LOOSENING OF THE WASHER UNDER THE NUT).
- TEST LOADS (1)(2)(3)

TORQUE TEST VALUES - EXPANSION ANCHORS NORMAL WEIGHT CONCRETE		
ANCHOR DIAMETER (INCH)	ANCHOR DEPTH (INCHES)	TORQUE (FT-LBF)
$\frac{3}{8}$	2	25
	2	40
$\frac{1}{2}$	$\frac{3}{4}$	40
	$\frac{3}{8}$	60
$\frac{5}{8}$	4	60
	$\frac{3}{4}$	110
$\frac{3}{4}$	$\frac{3}{4}$	110
	$\frac{4}{4}$	110

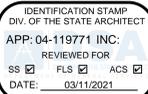
- TEST VALUES ARE BASED ON KWIK BOLT TZ (KB-TZ) EXPANSION ANCHORS BY HILTI, INC. (ICC EVALUATION REPORT NUMBER ESR-1917).
- TEST VALUES ARE BASED ON CARBON STEEL ANCHORS.
- VERIFY TORQUE VALUES WITH MANUFACTURER FOR SIMPSON STRONG-BOLT 2 (ICC ESR-3037) OR DEWALT POWER-STUD+SD2 (ICC ESR-2502)

TORQUE TEST VALUES - EXPANSION ANCHORS GROUT-FILLED CMU		
ANCHOR DIAMETER (INCH)	ANCHOR DEPTH (INCHES)	TORQUE (FT-LBF)
$\frac{3}{8}$	2	15
	2	25
$\frac{1}{2}$	$\frac{3}{4}$	25
	$\frac{3}{8}$	35
$\frac{5}{8}$	4	35
	$\frac{3}{4}$	70
$\frac{3}{4}$	$\frac{3}{4}$	70
	$\frac{4}{4}$	70

- TEST VALUES ARE BASED ON KWIK BOLT TZ (KB-TZ) EXPANSION ANCHORS BY HILTI, INC. (ICC EVALUATION REPORT NUMBER ESR-3785).
- TEST VALUES ARE BASED ON CARBON STEEL ANCHORS.
- VERIFY TORQUE VALUES WITH MANUFACTURER FOR SIMPSON WEDGE-ALL (ICC ESR-1396) OR DEWALT POWER-STUD+SD1 (ICC ESR-2966)

TORQUE TEST VALUES - SCREW ANCHORS NORMAL WEIGHT CONCRETE		
ANCHOR DIAMETER (INCH)	ANCHOR DEPTH (INCHES)	TORQUE (FT-LBF)
$\frac{3}{8}$	$2\frac{3}{4}$	50
	$3\frac{1}{2}$	50
$\frac{1}{2}$	$3\frac{3}{4}$	65
	$4\frac{1}{2}$	65
$\frac{5}{8}$	$4\frac{1}{2}$	100
	6	100
$\frac{3}{4}$	6	150
	$6\frac{3}{4}$	150

- TEST VALUES ARE BASED ON TITEN HD SCREW ANCHORS BY SIMPSON STRONG-TIE, (ICC EVALUATION REPORT NUMBER ESR-2713).
- VERIFY TORQUE VALUES WITH MANUFACTURER FOR HILTI KWIK HUS-EZ SCREW ANCHORS (ICC ESR-3027) OR DEWALT SCREW-BOLT+SCREW ANCHOR (ICC ESR-3889)



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ANCHORS AND/OR DOWELS INSTALLED WITH ADHESIVE

- ANCHORS AND/OR DOWELS SHALL BE INSTALLED WITH ADHESIVE ONLY WHERE INDICATED ON DRAWINGS.
- ANCHORS AND/OR DOWELS SHALL BE INSTALLED IN CONCRETE USING ONE OF THE FOLLOWING PRODUCTS IN ACCORDANCE WITH THE APPLICABLE ICC/IAPMO REPORT:
 - HILTI HIT-HY 200 ADHESIVE ICC NO. ESR-3187
 - SIMPSON SET-XP ADHESIVE ICC NO. ESR-2508
 - DEWALT PURE110+ ADHESIVE ICC NO. ESR-3298
- ANCHORS AND/OR DOWELS SHALL BE INSTALLED IN GROUTED MASONRY USING ONE OF THE FOLLOWING PRODUCTS IN ACCORDANCE WITH THE APPLICABLE ICC REPORT:
 - HILTI HIT-HY 200 ADHESIVE ICC NO. ESR-3963
 - SIMPSON SET-XP ADHESIVE IAPMO NO. ER-265
- ADHESIVE SYSTEMS OTHER THAN THOSE SPECIFIED SHALL BE SUBMITTED AS A SUBSTITUTION, AND ARE SUBJECT TO THE REVIEW AND APPROVAL OF THE ENFORCEMENT AGENCY, THE ARCHITECT, AND THE STRUCTURAL ENGINEER.
- HOLES SHALL BE DRILLED WITH NON-REBAR-CUTTING DRILL BITS.
- HOLES SHALL BE CLEAN OF CONCRETE DUST AND DEBRIS USING A STEEL WIRE BRUSH AND OIL-FREE COMPRESSED AIR. HOLES SHALL ALSO BE FREE OF STANDING WATER.
- PROJECT INSPECTOR SHALL VERIFY INSTALLATION OF ANCHORS OR DOWELS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, INCLUDING CLEANLINESS OF DRILL HOLES AND PROPER EMBEDMENT.
- ANCHORS SET IN CONCRETE AND GROUTED MASONRY SHALL BE TESTED TO 2 TIMES THE ASD ALLOWABLE TENSION LOAD, 1.25 TIMES THE LRFD STRENGTH CAPACITY, OR 80% OF THE YIELD STRENGTH OF THE BOLT FOR THE SPECIFIC LOCATION OF THE ANCHOR TO BE TESTED, WHICHEVER IS LESS. TORQUE TESTING IS NOT PERMITTED. SEE DETAILS FOR TEST LOADS.
- ADHESIVE ANCHORS INSTALLED IN HORIZONTAL TO VERTICALLY OVERHEAD ORIENTATION TO SUPPORT SUSTAINED TENSION LOADS SHALL BE DONE BY A CERTIFIED ADHESIVE ANCHOR INSTALLER (AA) AS CERTIFIED THROUGH ACI/CRSI (ACI 318-14 17.8.2.2). PROOF OF CURRENT CERTIFICATION SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF INSTALLATION.
- ADHESIVE ANCHORS MUST BE INSTALLED IN CONCRETE AGED A MINIMUM OF 21 DAYS.

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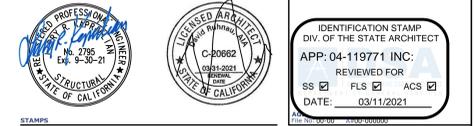
3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684-6664 / 3751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92008 (760) 438-5999

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GENERAL NOTES

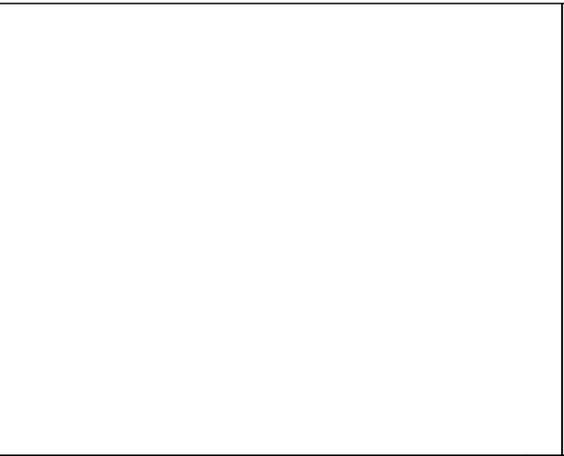
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GROSSMONT UNION HIGH SCHOOL DISTRICT

S0-1.2

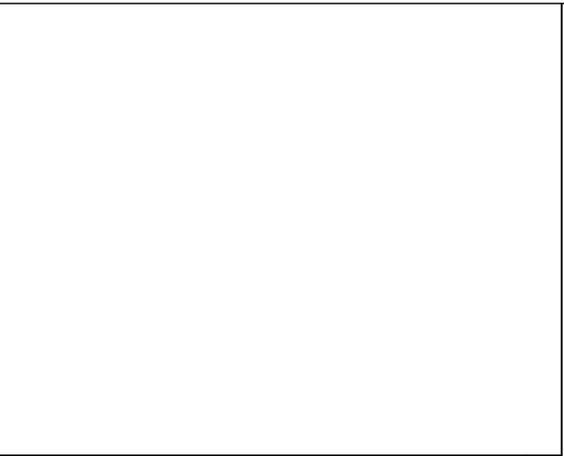


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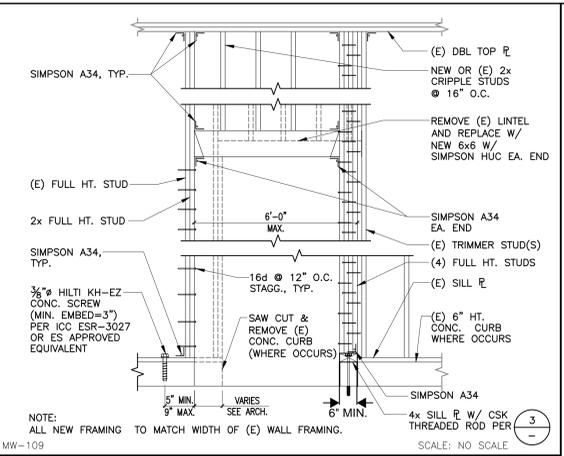
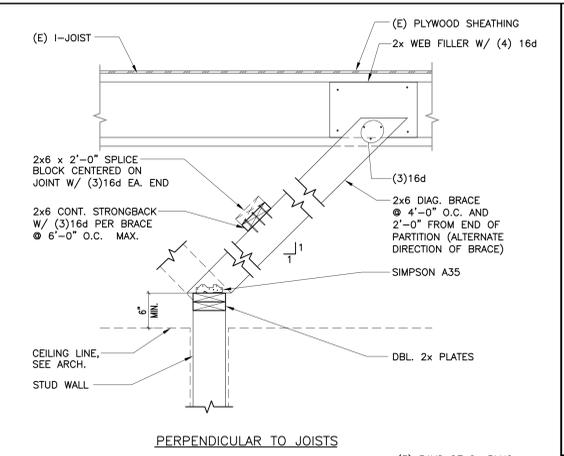
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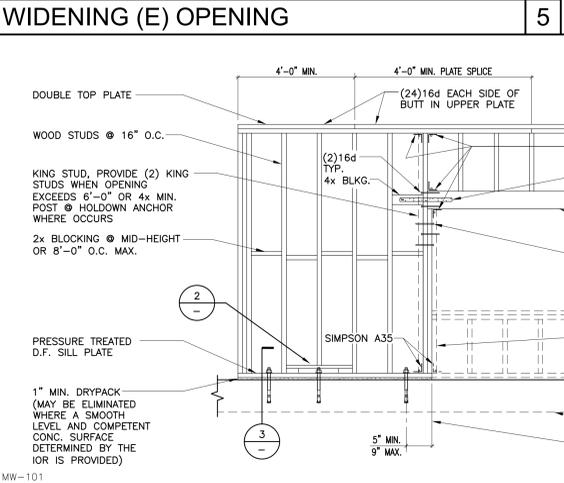
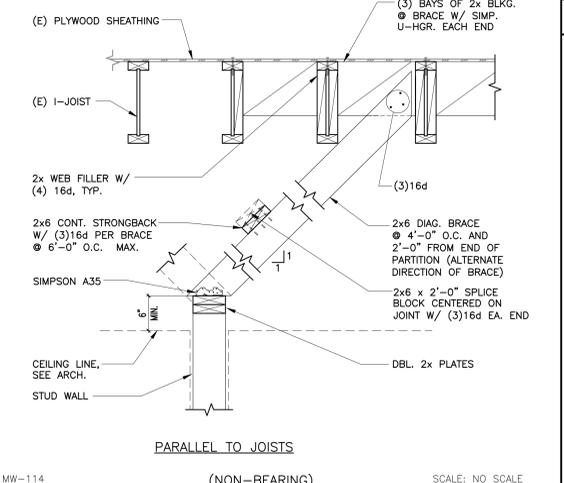
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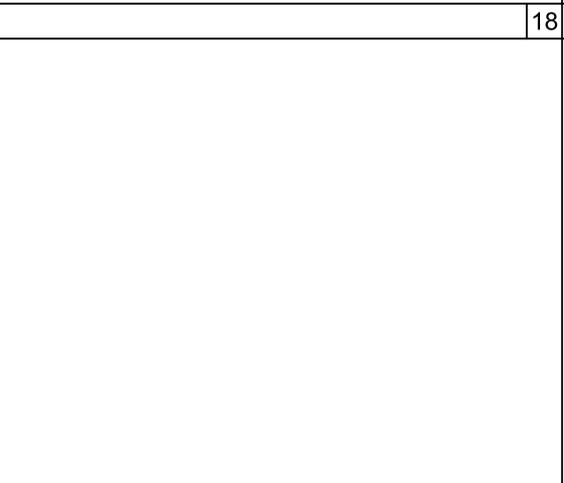


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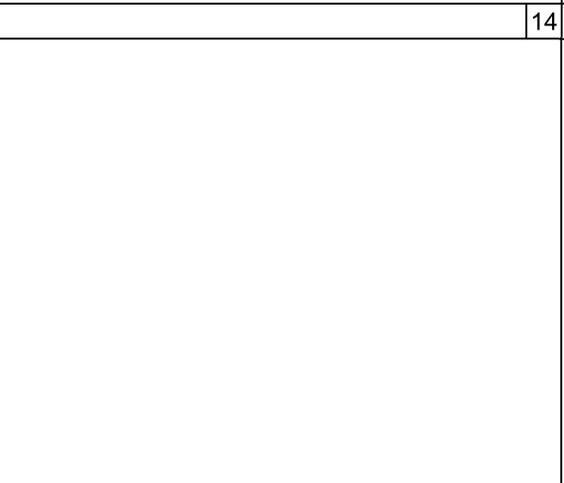


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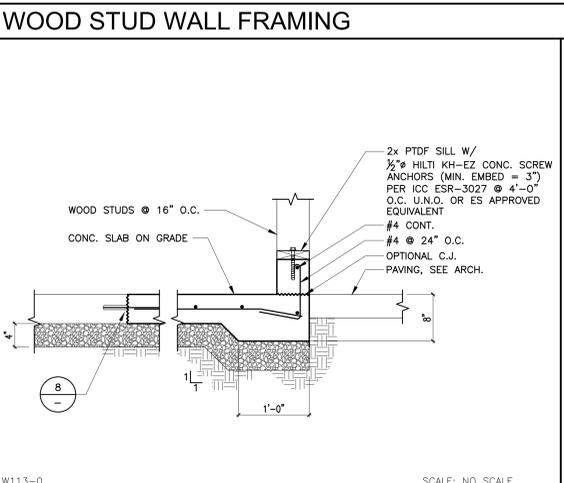
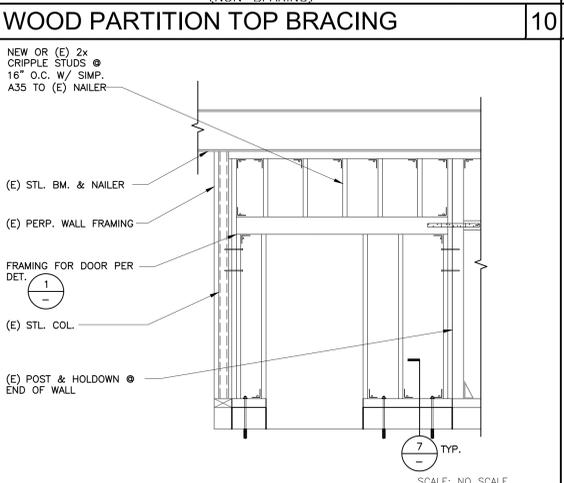
LINTEL SCHEDULE	
SPAN	D
UP TO 6'-0"	5 1/2"
6'-1" TO 8'-0"	7 1/4"
8'-1" TO 10'-0"	9 1/4"



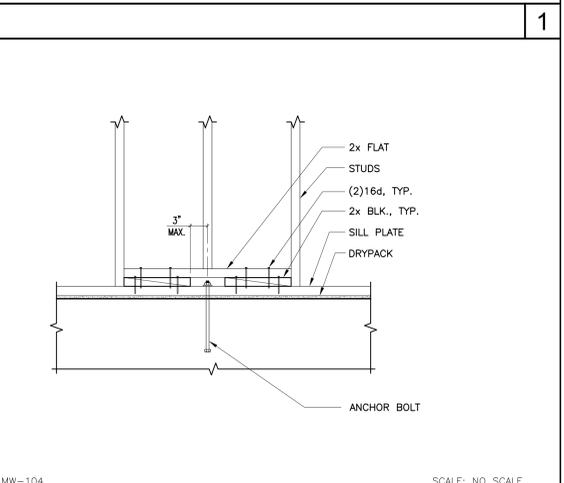
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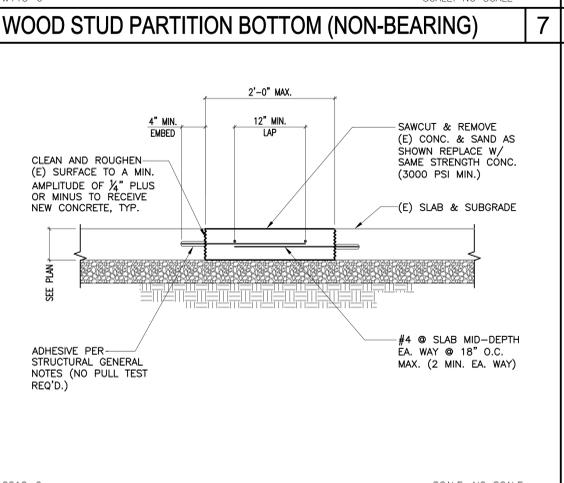
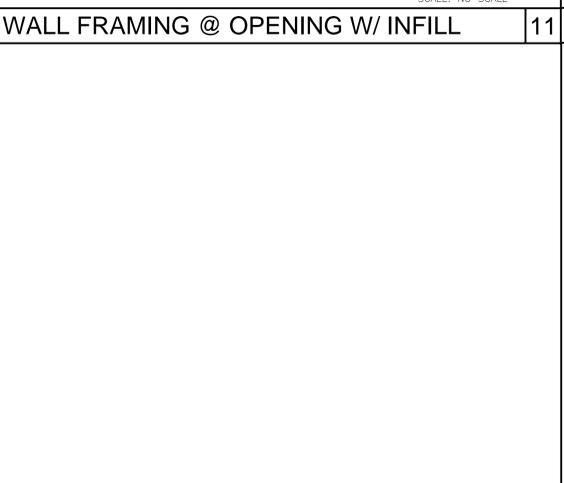
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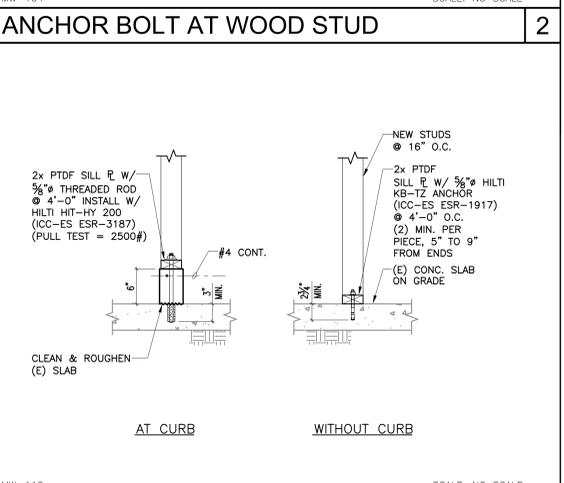
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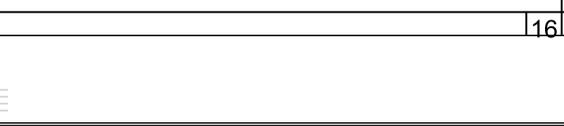


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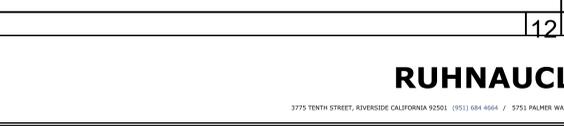
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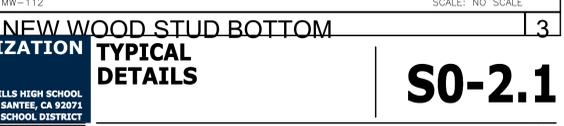
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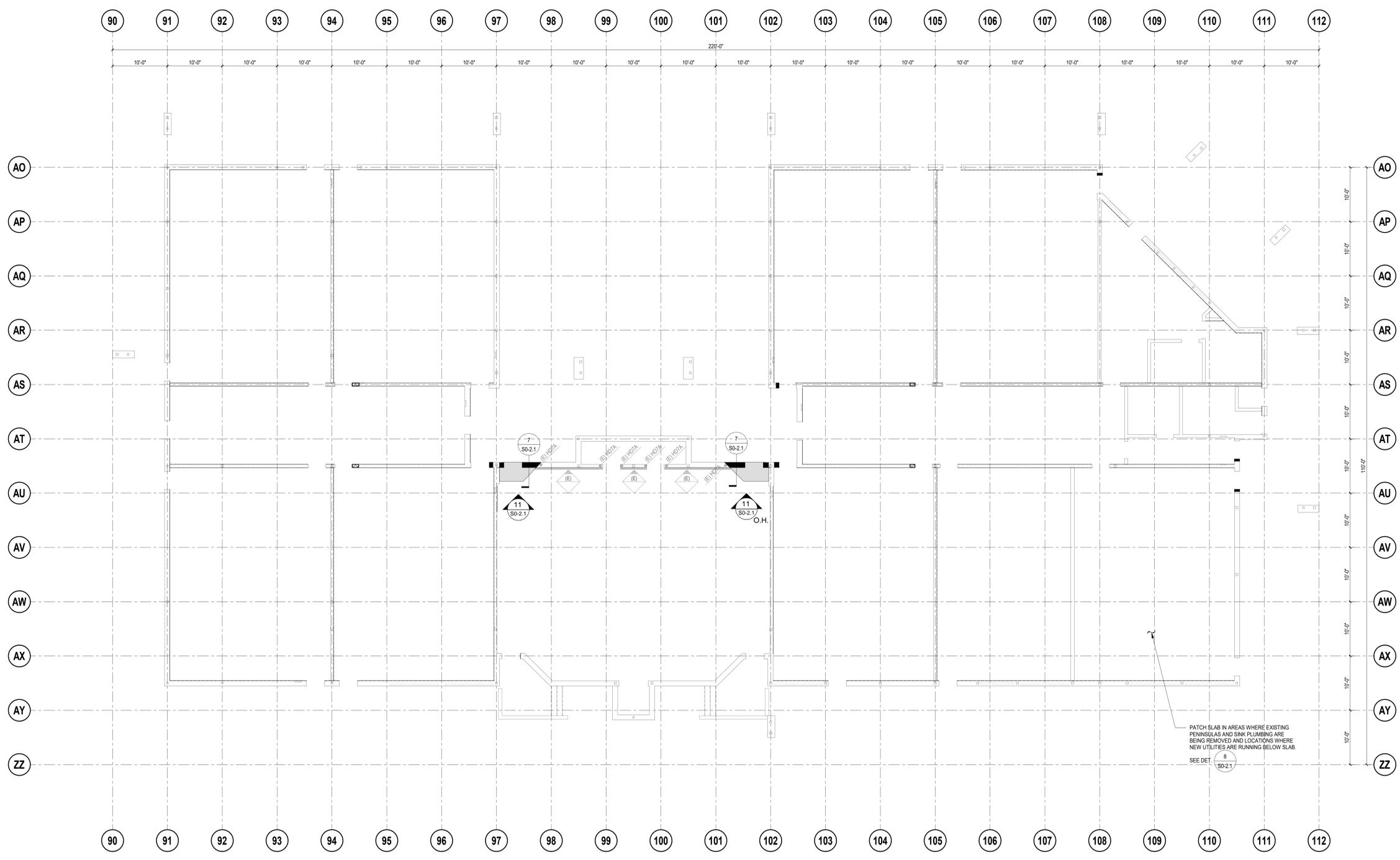
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FOUNDATION PLAN NOTES

- SEE SHEETS S0-1.1 THROUGH S0-2.1 FOR GENERAL NOTES AND TYPICAL DETAILS.
- SEE ARCHITECTURAL AND/OR CIVIL DRAWINGS FOR FINISH FLOOR ELEVATIONS.
- SEE ARCHITECTURAL AND CIVIL DRAWINGS FOR ALL EXTERIOR CONCRETE PAVING, SLABS, BASES, CURBS, SITE WALLS, ETC.
- FOR ANY DIMENSIONAL INFORMATION NOT SHOWN, SEE ARCHITECTURAL DRAWINGS.
- SEE PLANS AND ARCHITECTURAL DRAWINGS FOR DEPRESSIONS AND/OR SLOPES IN CONCRETE SLABS.
- ALL DIMENSIONS SHOWN ARE FROM FACE OF STUD, CENTER LINE OF COLUMN, OR CENTER LINE OF WALL, UNLESS NOTED OTHERWISE. ALL COLUMNS ARE CENTERED IN STUD WALL, UNLESS NOTED OTHERWISE.
- SEE ARCHITECTURAL DRAWINGS FOR SIZE AND LOCATION OF ALL DOOR AND WINDOW OPENINGS IN BEARING AND NON-BEARING WALLS.
- SEE ARCHITECTURAL DRAWINGS FOR LOCATION OF INTERIOR NON-BEARING PARTITIONS. INTERIOR NON-BEARING PARTITION WALLS THAT DO NOT REQUIRE CONCRETE CURBS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.

LEGEND

- INDICATES CONCRETE CURB. SEE PLANS AND DETAIL 3/S0-2.1 FOR ADDITIONAL INFORMATION.
- 5" CONCRETE W/ #4 @ 18" EACH WAY @ CENTER LINE OF SLAB (MINIMUM SPLICE = 24" STAGGERED); OVER VAPOR BARRIER, OVER 4" CRUSHED ROCK, OVER COMPACTED FILL OR NATURAL GRADE, UNLESS NOTED OTHERWISE.
- INDICATES NEW STUD WALL. SEE ARCH. FOR EXTENT.
- INDICATES (E) SHEAR WALL TO REMAIN.



FOUNDATION PLAN
 SCALE: 1/8" = 1'-0"

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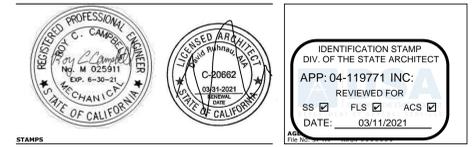
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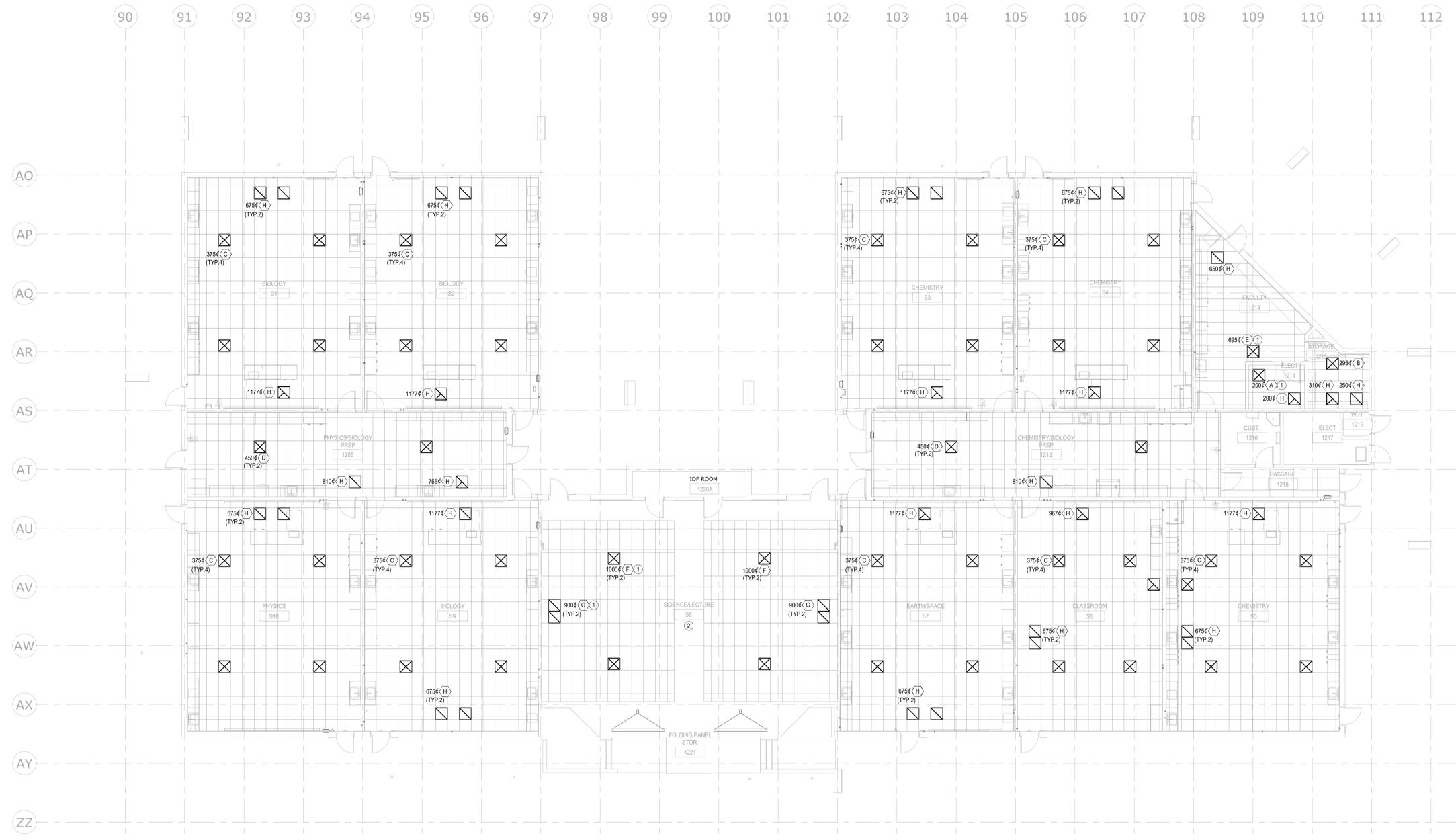
FOUNDATION PLAN

S1-1.1



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- KEYNOTES**
- 1 REPLACE ALL EXISTING REGISTERS FOR ALL SUPPLY, RETURN AND EXHAUST (TYP)
 - 2 THE LAYOUT IS BASED ON THE EXISTING DESIGN DOCUMENTS. THE CONTRACTOR SHALL FIELD VERIFY THE EXISTING CONDITIONS AND NOTIFY THE ARCHITECT IF THERE ARE ANY DISCREPANCIES.

AIR DISTRIBUTION SCHEDULE						
SYMBOL	TYPE	NECK SIZE	CFM	MODEL	ACCESSORIES	STYLE
(A)	SUPPLY AIR	8 x 8	200	TITUS PAS-AA PERFORATED FACE.	WITH OPPOSED BLADE DAMPER	SUPPLY GRILLE
(B)		10 x 10	295			
(C)		12 x 12	375			
(D)		14 x 14	450			
(E)		16 x 16	695			
(F)	20 x 20	1000				
(G)	RETURN / EXHAUST AIR	20 x 20	900	TITUS PAR-AA PERFORATED FACE.	WITH OPPOSED BLADE DAMPER	RETURN / EXHAUST GRILLE
(H)		22 x 22	200 - 1177			

1 MECHANICAL FIRST FLOOR PLAN
Scale: 1/8" = 1'-0"

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SCIENCE BLDG. MODERNIZATION

MECHANICAL FIRST FLOOR PLAN

M1-1.1

SCIENCE BLDG. MODERNIZATION: PROGRESS SET - 50% SD/DD SUBMITTAL - 10-23-2020

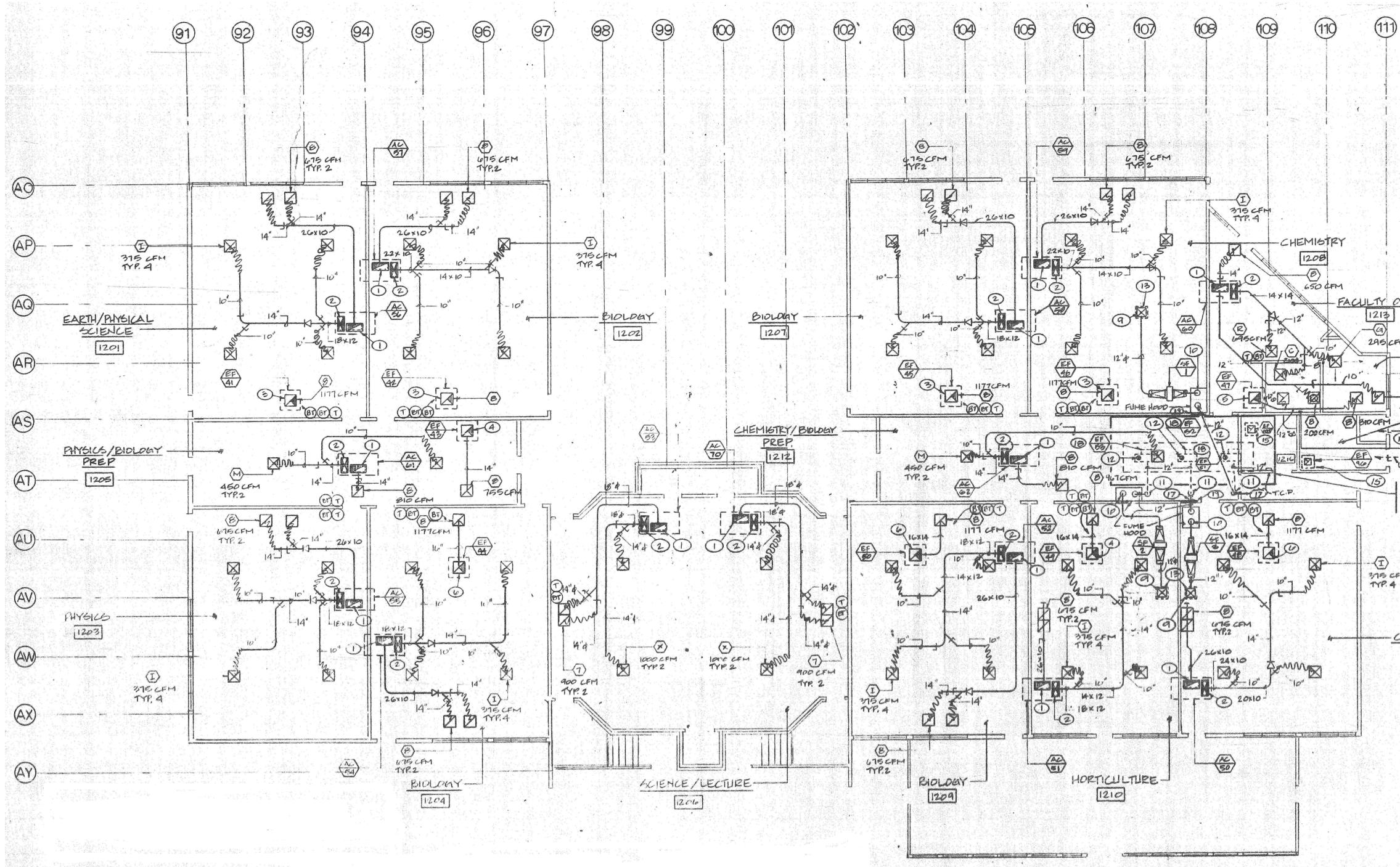


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- KEYNOTES**
- 1 THIS SHEET IS FOR ESTIMATING THE DUCT CLEANING EFFORT ONLY.
 - 2 THE LAYOUT IS BASED ON THE EXISTING DESIGN DOCUMENTS. THE CONTRACTOR SHALL FIELD VERIFY THE EXISTING CONDITIONS AND NOTIFY THE ARCHITECT IF THERE ARE ANY DISCREPANCIES.
 - 3 REFER TO SPECIFICATIONS FOR DUCT CLEANING REQUIREMENTS.

FOR EQUIPMENT ROOF SUPPORT IN THIS AREA SEE DETAIL M-18

PROJECT No.: 12/23/2020 8:45:45 AM

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SCIENCE BLDG. MODERNIZATION

MECHANICAL
 REFERENCE PLAN

M1-1.2

SCIENCE BLDG. MODERNIZATION: PROGRESS SET - 50% SD/DD SUBMITTAL - 10-23-2020

PLUMBING LEGEND AND ABBREVIATIONS					
SYMBOL	ABBREV.	DESCRIPTION	SYMBOL	ABBREV.	DESCRIPTION
	POC	POINT OF CONNECTION		ABV	ABOVE
	AW	WASTE OR SEWER BELOW SLAB		A/C	ABOVE CEILING
	AW	ACID WASTE		ADA	AMERICANS WITH DISABILITIES ACT
	AW	WASTE OR SEWER ABOVE SLAB		A.F.F.	ABOVE FINISH FLOOR
	V	SANITARY VENT		A.F.G.	ABOVE FINISH GRADE
	CW	COLD WATER		AG	ABOVE GRADE
	HW	HOT WATER		BF	BELOW FLOOR
	HWR	HOT WATER RETURN		B/G	BELOW GRADE
	G	LOW PRESSURE NATURAL GAS (7" W.C.)		DWGS.	DRAWINGS
	MPG	MEDIUM PRESSURE NATURAL GAS (5 PSI)		EA.	EACH
	RD	ROOF DRAIN		EXIST.	EXISTING
	ORD	OVERFLOW ROOF DRAIN		(E)	EXISTING
	CD	CONDENSATE DRAIN		FT.	FEET OR FOOT
	OCD	OVERFLOW CONDENSATE DRAIN		F	FIRE RISER
	SD	STORM DRAIN		FLR.	FLOOR
	SNV	SOLENOID VALVE		I.E.	INVERT ELEVATION
	SOV	SHUT OFF VALVE		NTS	NOT TO SCALE
	PRV	PRESSURE REDUCING VALVE		ORD	OVERFLOW ROOF DRAIN
	FS	FLOOR SINK		OH	OVERHEAD
	FD	FLOOR DRAIN		LB	POUNDS
	FCO	FLOOR CLEAN-OUT		PSI	POUNDS PER SQUARE INCH
	WCO	WALL CLEAN-OUT		RD	ROOF DRAIN
	GCO	GRADE CLEAN-OUT		SF	SQUARE FEET
	2WGCO	2 WAY GRADE CLEAN-OUT		T.D.H.	TOTAL DEVELOPED HEAD
	DN	DOWN OR DROP		UG	UNDERGROUND
	UP	RISE OR RISER		V.T.R.	VENT THROUGH ROOF
	HB	HOSE BIBB		W.C.	WATER COLUMN
		VALVE ON RISE OR DROP			
	U	UNION			
	RV	TEMPERATURE & PRESSURE RELIEF VALVE			
	CP	CIRCULATING PUMP			
	CV	CHECK VALVE			
	REG	GAS REGULATOR W/SHUT-OFF VALVE			
	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER			
	GC	GAS COCK			

- ### GENERAL NOTES
- THESE DRAWINGS ARE A GENERAL GRAPHIC PRESENTATION OF THE WORK, PIPING AND EQUIPMENT, AS SHOWN, ARE SCHEMATIC, FABRICATE AND INSTALL BASED ON ACTUAL FIELD MEASUREMENT. COORDINATE WITH OTHER TRADES. PROVIDE A COMPLETE SET OF SHOP DRAWINGS REFLECTING ACTUAL INSTALL, ACCESS REQUIREMENTS, AND DETAILS BASED UPON THE ACTUAL EQUIPMENT PROCURED. MAINTAIN AN UP TO DATE SET OF AS-BUILT DRAWINGS AT THE JOB SITE.
 - THESE DRAWINGS ARE TO BE CONSIDERED NOT FOR CONSTRUCTION UNTIL THEY ARE STAMPED, SIGNED, AND PERMITTED, UNTIL THEN THEY ARE SUBJECT TO CHANGE WITHOUT NOTICE.
 - COMPLY WITH CALIFORNIA MECHANICAL CODE (CMC), CALIFORNIA PLUMBING CODE (CPC), AND NATIONAL FIRE PROTECTION AGENCY (NFPA), AND GOVERNING CODES. THERE SHALL BE NO EXCEPTION, REPORT DEFICIENCIES WITHIN THIRTY (30) DAYS UPON AUTHORIZATION TO PROCEED.
 - PROVIDE ACCESS AND CLEARANCE FOR MAINTENANCE FOR MECHANICAL & PLUMBING EQUIPMENT AND COMPONENTS AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER AND APPLICABLE CODES.
 - HANDLE, STORE AND INSTALL EQUIPMENT PER MANUFACTURERS INSTRUCTIONS.
 - NO PLUMBING SHALL BE INSTALLED UNTIL ALL REQUIRED PLUMBING PLAN CHECK PERMITS AND APPROVALS HAVE BEEN OBTAINED FROM ALL REQUIRED AGENCIES.
 - LAVATORY FAUCETS, SINK FAUCETS (NOT INCLUDING SERVICE SINK FAUCETS OR FAUCETS DESIGNATED AT INSTITUTIONAL) SHALL MEET THE FLOW REQUIREMENTS OUTLINED IN THE APPLIANCE EFFICIENCY STANDARDS.
 - COORDINATE WITH THE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF PLUMBING FIXTURES AND DRAINS.
 - HOSE BIBBS SHALL BE PROTECTED BY AN APPROVED NON-REMOVABLE TYPE BACKFLOW PROTECTION DEVICE. HOSE BIBBS SHALL BE MOUNTED AT +18" ABOVE FLOOR UNLESS OTHERWISE NOTED.
 - PROVIDE ALL TAILPIECES, TRAPS, STOPS, SUPPLY PIPES TO LAVATORIES DESIGNED AS ACCESSIBLE, WITH PREFORMED INSULATION JACKET.
 - COORDINATE AND VERIFY SIZES, LOCATIONS, DEPTHS AND PRESSURIZED PIPING PRESSURES OF ALL BUILDING UTILITIES WITH CIVIL.
 - COORDINATE AND SCHEDULE TIMING FOR UTILITY SERVICE CONNECTION.
 - ALL LINES BELOW SLAB ON GRADE TO BE LOCATED AWAY FROM ALL LOAD BEARING FOOTINGS.
 - ALL LINES RUNNING BELOW GRADE BEAMS OR PENETRATING, SEE STRUCTURAL DRAWINGS FOR CONSTRUCTION.
 - ALL VENTS THRU ROOF SHALL BE MINIMUM OF 18 INCHES VERTICAL AND FIFTEEN FEET HORIZONTAL AWAY FROM ALL AIR CONDITIONING FRESH AIR INTAKES AND PROVIDED WITH VANDAL PROOF HOODS.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING OF WALLS, ROOFS, FOOTINGS, FLOORS, INCLUDING ALL SAW CUTTING AND CORE DRILLING. COORDINATE ALL SAW CUTTING AND CORE DRILLING WITH STRUCTURALLY DRAWINGS. ANY CUTTING AND DRILLING REQUIRED OF STRUCTURAL ELEMENTS THAT IS NOT SPECIFICALLY SHOWN ON THE PLANS SHALL BE BROUGHT TO THE ARCHITECTS ATTENTION PRIOR TO CUTTING AND DRILLING. CONTRACTOR SHALL SUBMIT PROPOSED LOCATION AND SIZES OF SUCH CUTTING AND DRILLING FOR THE ARCHITECTS AND STRUCTURAL ENGINEERS APPROVAL.
 - COORDINATE ALL EQUIPMENT LOCATIONS, PIPE PENETRATIONS AND EQUIPMENT PAD LOCATIONS WITH STRUCTURAL DRAWINGS PRIOR TO WORK.
 - COORDINATE INSTALLATION OF ALL EQUIPMENT AND PIPING WITH OTHER TRADES PRIOR TO INSTALLATION. ENSURE THAT ALL CONTROL DEVICES, SHUT-OFF VALVES, ETC. ARE ACCESSIBLE FOR MAINTENANCE. WHERE ACCESS PANELS IN FINISHED SPACES, OTHER THAN THAT SHOWN, CONTRACTOR SHALL PROVIDE AND COORDINATE EXACT LOCATION OF PANELS WITH ARCHITECT PRIOR TO INSTALLATION.
 - INSTALL VALVES WITH UNIONS OR FLANGES AT EACH PIECE OF EQUIPMENT ARRANGED TO ALLOW SERVICE, MAINTENANCE, AND EQUIPMENT REMOVAL WITHOUT SYSTEM SHUT-DOWN.
 - ANY STRUCTURAL FIREPROOFING DAMAGED DURING INSTALLATION OF PLUMBING EQUIPMENT, PIPING, ETC. SHALL BE REPAIRED AT NO COST TO THE OWNER. REPAIRS SHALL BE AS DIRECTED BY THE ARCHITECT.
 - FAUCETS TO BE 1.8 GPM MAXIMUM.
 - WATER HEATER IS TO BE USED ON CALIFORNIA ENERGY COMMISSION (CEC) LIST.
 - PROVIDE EXPANSION TANK OR OTHER APPROVED METHOD OF RELIEVING PRESSURE (SECTION 608.3 CPC).
 - CROSS CONNECTION PROTECTION SHALL BE PROVIDED AT ALL POTABLE WATER SUPPLIED APPLIANCES AND EQUIPMENT.
 - COORDINATE WITH ELECTRICAL AND CONTROL CONTRACTORS FOR ALL POWER REQUIREMENTS PRIOR TO BID.
 - COORDINATE WITH ELECTRICAL AND CONTROL CONTRACTORS FOR ALL POWER REQUIREMENTS PRIOR TO ORDERING ANY EQUIPMENT.
 - UPON INSTALLATION OF ALL EQUIPMENT, DEVICES, VIBRATION ISOLATION, ETC., PROVIDE WRITTEN CONFIRMATION BY EQUIPMENT MANUFACTURER'S REPRESENTATIVES TO ENSURE COMPLIANCE WITH MANUFACTURER'S REQUIREMENTS.
 - PROVIDE DETAILS AND SEISMIC CALCULATIONS FOR ALL EQUIPMENT ON VIBRATION ISOLATION. ALL DETAILS SHALL BE STAMPED BY A STRUCTURAL ENGINEER FROM VIBRATION ISOLATIONS MANUFACTURER.
 - FOR EACH SUBMITTAL, THE CONTRACTOR SHALL PROVIDE A LETTER (ON COMPANY LETTERHEAD) AND SIGNED BY THE PROJECT MANAGER INDICATING THE SUBMITTAL HAS BEEN FULLY IN HOUSE REVIEWED TO ENSURE FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND COORDINATION WITH OTHER TRADES. ANY EXCEPTIONS TO THE CONTRACT DOCUMENTS SHALL BE CLEARLY INDICATED ON THIS LETTER. ANY DISCREPANCIES/EXCEPTIONS NOT IDENTIFIED IN WRITING SHALL BE CORRECTED AT THE SOLE EXPENSE OF THE CONTRACTOR AND AT NO EXPENSE TO THE OWNER AND ENGINEER.
 - THE CONTRACTOR SHALL SELECT ALL CIRCUIT SETTERS/BALANCING VALVES FOR ACTUAL FLOW THROUGH THE PIPE AND THE PROPER PRESSURE DROP TO ENSURE PROPER OPERATION AND NOT BASED ON PIPE SIZES.
 - HOT WATER PIPING SHALL HAVE A MINIMUM INSULATION FOR THE FOLLOWING PIPE SIZES: 1/2" (1/2" INSULATION); 3/4" (1" INSULATION); 1"-1-1/2" (1-1/2" INSULATION); 2" PIPES AND LARGER (2" INSULATION); CPC 609.11 & ES 150.0 (J).

- ### PIPE MATERIALS
- WATER ABOVE GRADE: COPPER TYPE "L" HARD DRAWN WITH WROUGHT COPPER SOLDER JOINT FITTINGS.
 - WATER BELOW GRADE: COPPER TYPE "K" WITH CAST SOLDER JOINT FITTINGS, ROUGH SOLDER JOINT FITTINGS, OR FLARED JOINT FITTINGS.
 - SOIL/WASTE AND VENT ABOVE GRADE: HUBLESS CAST IRON PIPE AND FITTINGS.
 - SOIL/WASTE AND VENT BELOW GRADE: POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS PER ASTM D2665.
 - STORM DRAIN ABOVE GRADE: HUBLESS CAST IRON PIPE AND FITTINGS.
 - STORM DRAIN BELOW GRADE: POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS PER ASTM D2665.

- ### SLOPE OF PIPING SYSTEMS
- SANITARY SEWER, ACID WASTE, WASTE & VENT PIPING: 2% UNLESS NOTED OTHERWISE.
 - STORM DRAIN PIPING: 1% UNLESS NOTED OTHERWISE.
 - CONDENSATE DRAIN PIPING: 2%.

REGISTERED PROFESSIONAL ENGINEER
ROBERT C. CAMPBELL
No. M 025911
Exp. 6-30-21
STATE OF CALIFORNIA

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C-20662
03/11/2021
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LEGEND & NOTES **P1-0.1**

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PLUMBING FIXTURE SCHEDULE							
SYMBOL	FIXTURE	ROUGH-IN					REMARKS
		HW	CW	W	TRAP	V	
	LAB SINK	1/2"	1/2"	2"	1 1/2"	1 1/2"	KEMRESIN, 1047-DI-BK, DROP IN, 26-1/4" X 20-1/4", EPOXY RESIN, WITH LABORATORY PRODUCTS, BL-5704-08W4-VR DOUBLE LEDGE FAUCET.
	LAB SINK - ACCESSIBLE	1/2"	1/2"	2"	1 1/2"	1 1/2"	KEMRESIN, 1005-ADA-BK, DROP IN, 27-1/4" X 17-1/4", EPOXY RESIN, WITH LABORATORY PRODUCTS, BL-5707-01CRWH4 SINGLE LEDGE FAUCET, ACCESSIBLE.
	SINK - ACCESSIBLE	1/2"	1/2"	2"	1 1/2"	1 1/2"	KEMRESIN, F-5361-06, DROP IN, 22" X 25", STAINLESS STEEL, WITH JUST FAUCET, J-1174-KS, ACCESSIBLE.
	MOP SINK	1/2"	1/2"	3"	3"	2"	ENAMELED CAST IRON, FLOOR MOUNT, CORNER BASIN, ACID-RESISTANT ENAMEL FINISH, BRASS VACUUM BREAKER, PAIL HOOK.

PLUMBING EQUIPMENT SCHEDULE											
SYMBOL	TYPE	ELECTRICAL DATA				CAPACITY		STORAGE VOLUME (GALLON)	WEIGHT (LBS)	DESCRIPTION	LOCATION
		POWER (HP)	VOLTS (V)	PHASE (PH)	HERTZ (HZ)	INPUT (MBH)	OUTPUT (MBH)				
	LAB TURRET (GAS)	--	--	--	--	--	--	--	--	T&S, BL-4200-02, LABORATORY TURRET, POLISHED CHROME, BRASS BODY, 0.5 PSIG MAX. NATURAL GAS.	--
	EMERGENCY SHOWER	--	--	--	--	--	--	--	--	GUARDIAN, G1643SSH, EMERGENCY SHOWER, STAINLESS STEEL HEAD, PROVIDE MIXING VALVE.	--
	EMERGENCY EYE WASH	--	--	--	--	--	--	--	--	GUARDIAN, GBF1724, EMERGENCY EYE WASH, WALL MOUNTED, PROVIDE MIXING VALVE, BARRIER FREE.	--



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C-20862
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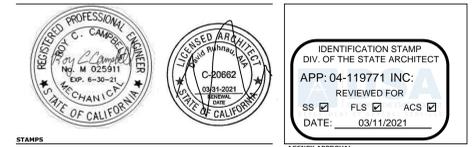
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PLUMBING SCHEDULES

P1-0.2

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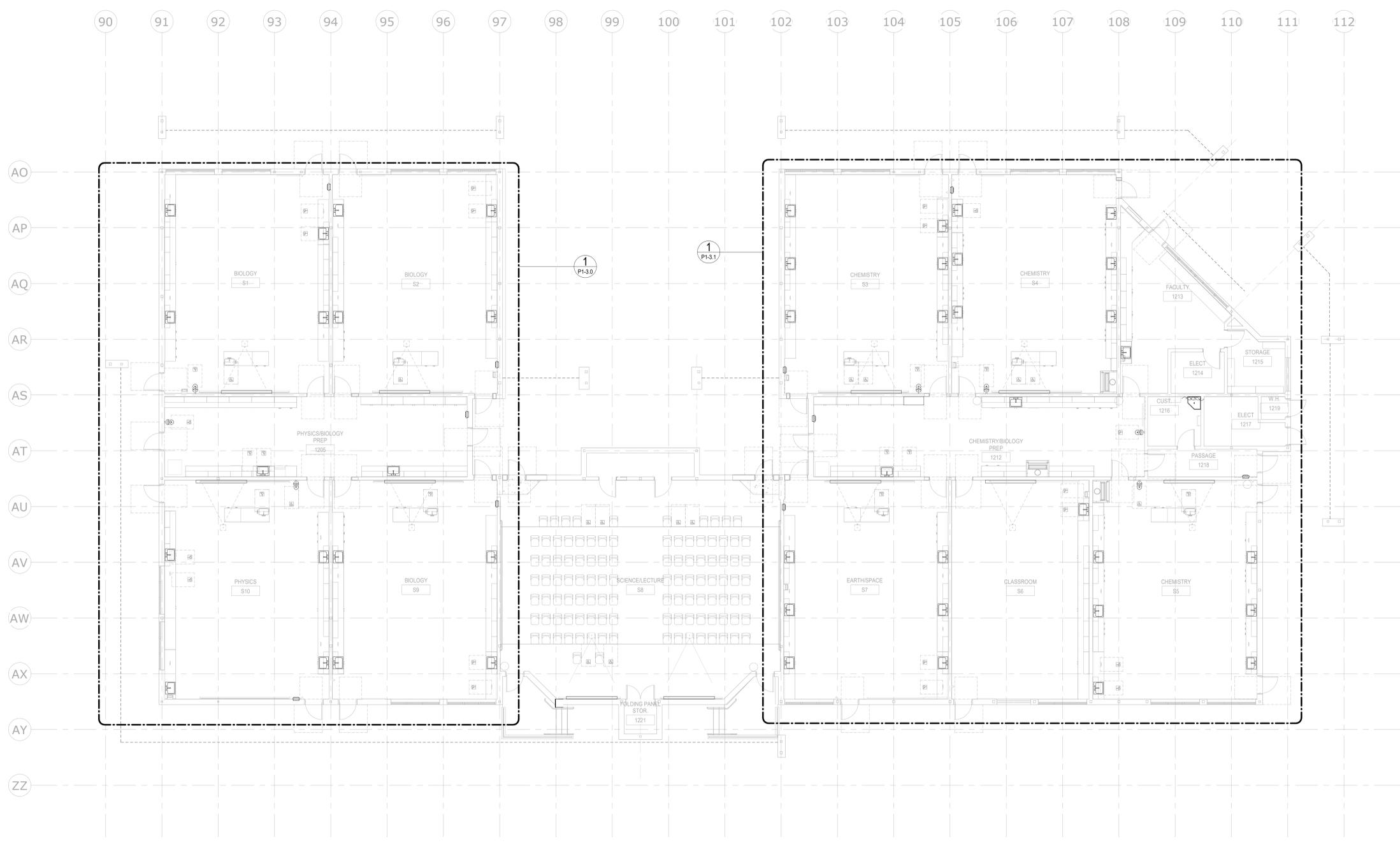
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CONSULTANT BRANDING

KEYNOTES

GENERAL NOTES

KEY PLAN



FIRST FLOOR PLAN - MOD. SCALE: 1/8" = 1'-0" 1

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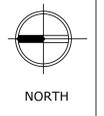
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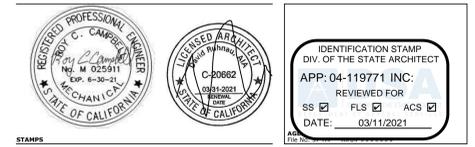
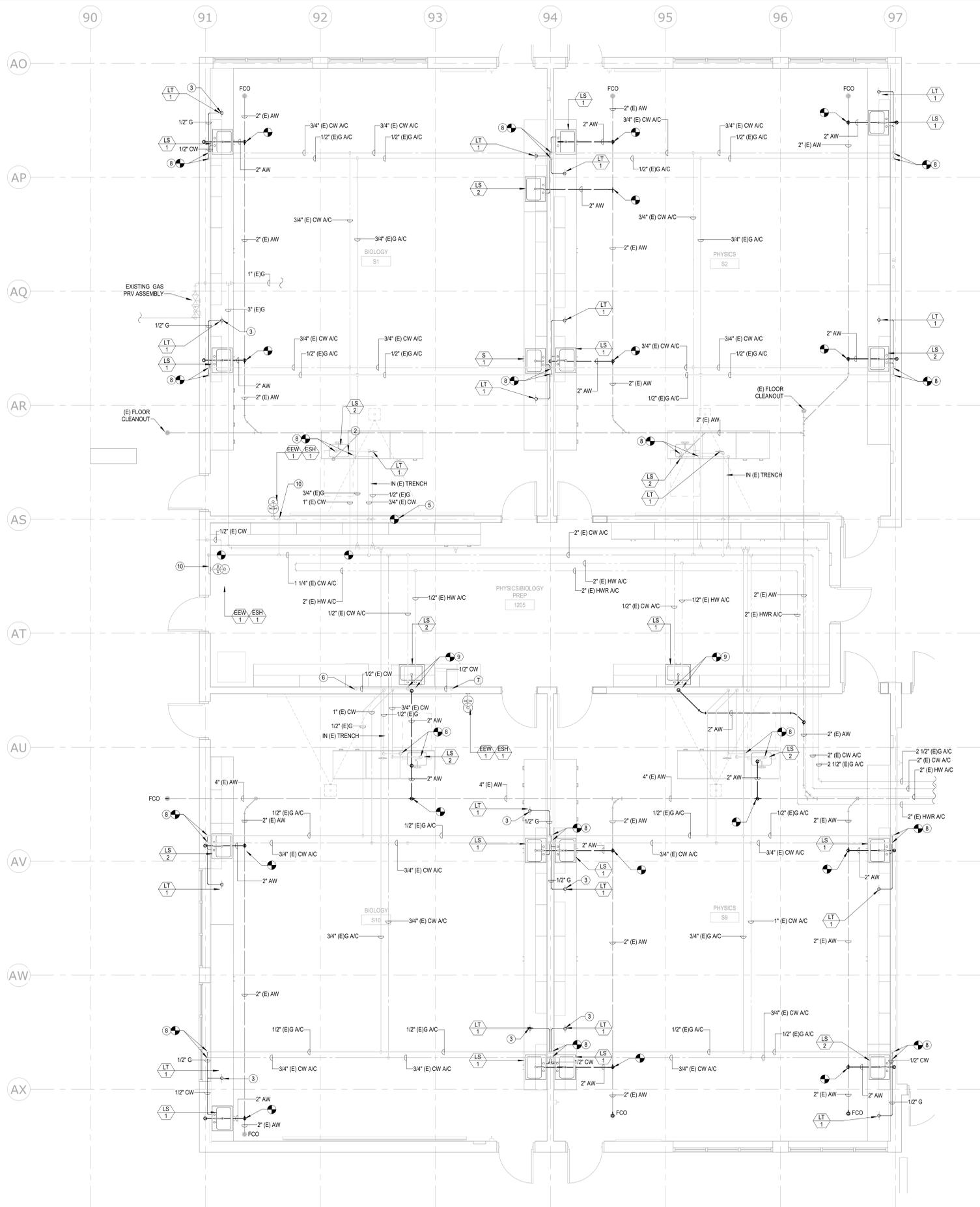
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PLUMBING FLOOR PLAN - MOD.

P1-1.2



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KEYNOTES

- 1 POC 1-1/4" CW TO (E) 2" CW.
- 2 RECONNECT NEW SINK TO (E) 3/4" CW.
- 3 1/2" GAS UP TO LAB GAS TURRET.
- 4 POC (E) 1/2" CW TO NEW 1-1/4" CW.
- 5 POC 1/2" CW TO (E) 1/2" CW IN WALL. ROUTE TO NEW LAB SINK.
- 6 RECONNECT EXISTING 1/2" TO NEW GLASSWASHER.
- 7 EXTEND NEW 1/2" CW TO ICE MACHINE.
- 8 EXTEND EXISTING CW AND GAS UTILITIES TO NEW PLUMBING FIXTURE.
- 9 EXTEND EXISTING CW AND HW UTILITIES TO NEW PLUMBING FIXTURE.
- 10 EXTEND EXISTING CW UTILITIES TO NEW PLUMBING FIXTURE.

FIRST FLOOR PLAN (MOD.) WEST- PLUMBING ENLARGED PLAN 1

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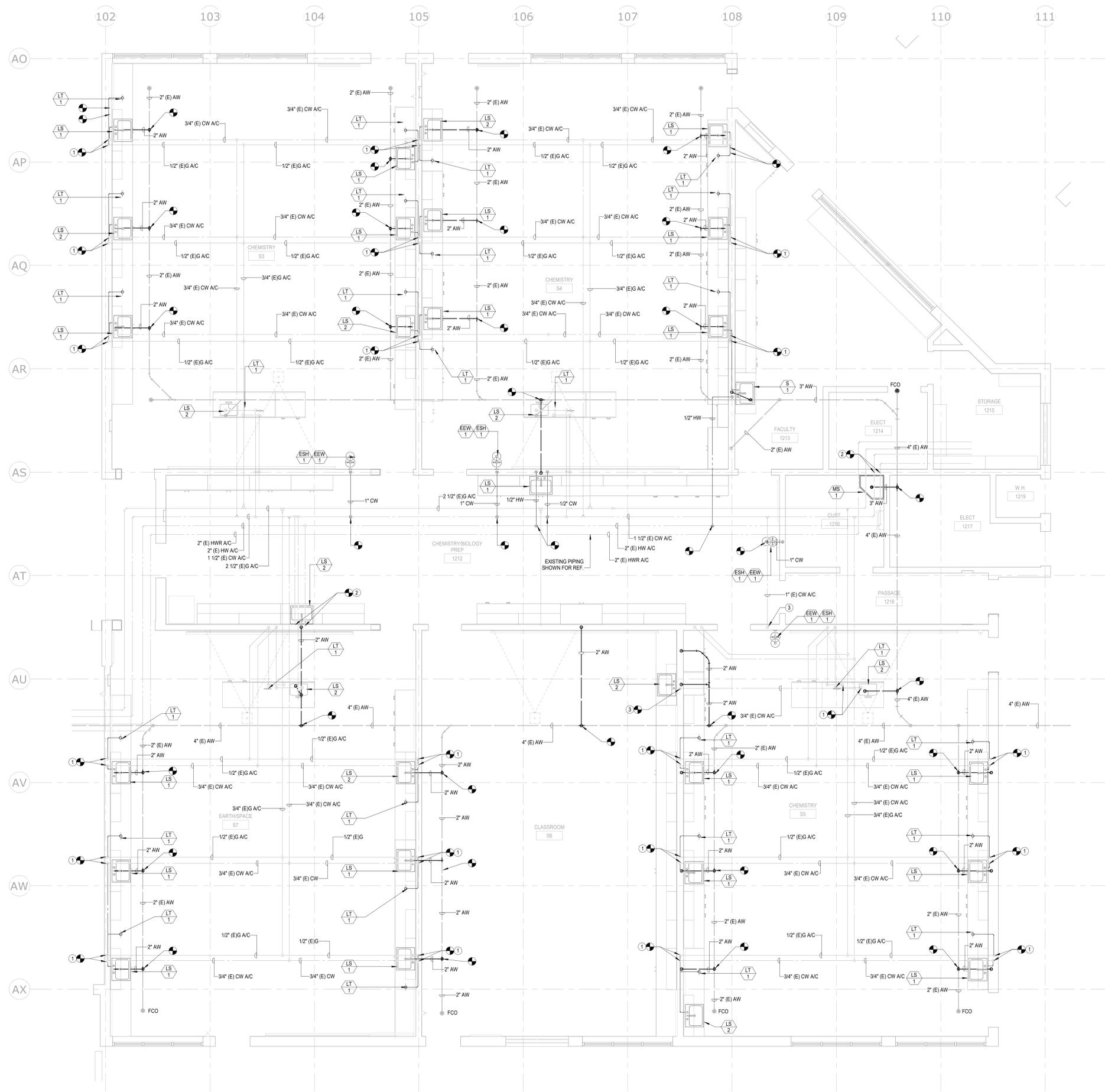
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PLUMBING ENLARGED PLANS **P1-3.0**

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- CONSULTANT BRANDING
- KEYNOTES**
- 1 EXTEND EXISTING CW AND GAS UTILITIES TO NEW PLUMBING FIXTURE.
 - 2 EXTEND EXISTING CW AND HW UTILITIES TO NEW PLUMBING FIXTURE.
 - 3 EXTEND EXISTING CW UTILITIES TO NEW PLUMBING FIXTURE.

FIRST FLOOR PLAN (MOD.) EAST - PLUMBING ENLARGED PLAN SCALE: 1/4" = 1'-0" 1

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PLUMBING ENLARGED PLANS
P1-3.1

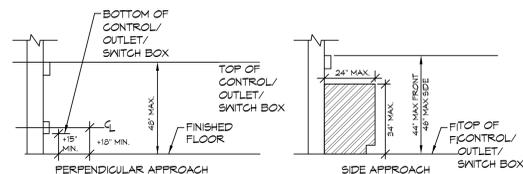
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ABBREVIATIONS

A	AMPERE (AMPS)
AC	ALTERNATING CURRENT
AF	AMPS-FRAME (RATING)
AC	AMP INTERRUPTING CURRENT
AM	AMMETER
AS	AMP SWITCH (FUSED SWITCH RATING)
AT	AMPS-TRIP (RATING)
AWG	AMERICAN WIRE GAUGE
BC	BARE COPPER
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
CO	CONDUIT ONLY
CT	CURRENT TRANSFORMER
CJ	COPPER
CFOI	CONTRACTOR FURNISHED OWNER INSTALLED
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
DFDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DWG	DRAWING
EX	EXISTING
FLA	FULL LOAD AMPS
FVR	FULL VOLTAGE REVERSING
FVNR	FULL VOLTAGE NON-REVERSING
GFI	GROUND FAULT INTERRUPTER
GRD/SND	GROUND
HD	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HZ	HERTZ
KM	KILOMATT
LCL	LONG CONTINUOUS LOAD
LRA	LOCKED ROTOR AMPS
LTS	LIGHTING
MCC	MOTOR CONTROL CENTER
MCM (KCM)	THOUSAND CIRCULAR MILS
MECH	MECHANICAL
NC	NORMALLY CLOSED
NF	NON-FUSED
NO	NORMALLY OPEN/NUMBER
OCFI	OWNER FURNISHED CONTRACTOR INSTALLED
OCFOI	OWNER FURNISHED OWNER INSTALLED
P	PHASE
POC	POINT OF CONNECTION
FRS	PVC COATED RIGID STEEL (CONDUIT)
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE DUCT
SWBD	SWITCHBOARD
TYP	TYPICAL
UG	UNDERGROUND
UN	UNLESS OTHERWISE NOTED
V	VOLT
VA	VOLTAMPERES
VM	VOLTMETER
VL	VERIFY LOCATION
W	WIRE/WATTS
WP	WEATHERPROOF (NEMA TYPE 3R)
WT	WATERTIGHT
XP	EXPLOSION PROOF (RATED FOR AREA HAZARD)

ELECTRICAL SYMBOL LEGEND

LIGHTING	
	LIGHTING FIXTURE DESIGNATION
	LIGHTING FIXTURE, CEILING OR WALL MOUNTED AS SHOWN
	LIGHT FIXTURE
	LIGHTING FIXTURE ON EMERGENCY CIRCUIT (LIGHTING INVERTER OR BATTERY PACK)
	EXIT SIGN WITH DIRECTION ARROWS AS INDICATED. SHADED QUADRANT INDICATES FACE
	EMERGENCY LIGHTING UNIT, WALL MOUNTED 12" BELOW CEILING (U.O.N.) LETTER INDICATES CIRCUIT CONTROLLED
	STRIP LIGHT
	SINGLE POLE SWITCH, SUBSCRIPT WHEN SHOWN INDICATES FIXTURES CONTROLLED +48" A.F.F. (U.O.N.) HEIGHT PER DETAILS #1/E1.0.
	S3 THREE-WAY SWITCH +48" A.F.F. (U.O.N.) HEIGHT PER DETAILS #1/E1.0
	S4 FOUR-WAY SWITCH +48" A.F.F. (U.O.N.) HEIGHT PER DETAILS #1/E1.0
	SWITCH WITH PILOT LIGHT +48" A.F.F. (U.O.N.) HEIGHT PER DETAILS #1/E1.0
	S2 DOUBLE POLE SWITCH +48" A.F.F. (U.O.N.) HEIGHT PER DETAILS #1/E1.0
	SWP WEATHER PROOF SWITCH +48" A.F.F. (U.O.N.) HEIGHT PER DETAILS #1/E1.0
	SK KEY OPERATED SWITCH +48" A.F.F. (U.O.N.) HEIGHT PER DETAILS #1/E1.0
	SV SURFACE MOUNTED TRACK LIGHTING FIXTURES
	ES EXTERIOR SITE LIGHTING FIXTURE AND POLE
	ED EXTERIOR DECORATIVE SITE LIGHTING FIXTURE AND POLE
	LD LANDSCAPE LIGHTING FIXTURE
	SL SPORTSLIGHTING FIXTURES AND POLES
	H[8] WALL MOUNTED OCCUPANCY SENSOR LIGHTING CONTROL +48" A.F.F. (U.O.N.) HEIGHT PER DETAILS #1/E1.0
	[8] CEILING MOUNTED (CORNER OF THE ROOM) OCCUPANCY SENSOR LIGHTING CONTROL
	[8] CEILING MOUNTED OCCUPANCY SENSOR LIGHTING CONTROL
	SLV LOW VOLTAGE LIGHT SWITCH, HEIGHT PER DETAILS #1/E1.0
	[A] DIGITAL LIGHTING CONTROL TYPICAL ROOM REQUIREMENTS. 1 E2.4
	NUMBERED DEVICES ARE ADDITIONAL ITEMS SHOWN ON FLOOR PLAN IN ADDITION TO WHAT IS REQUIRED FOR THE TYPICAL ROOM REQUIREMENTS.
	--PZ-- INDICATES PRIMARY DAYLIT ZONE
	--SZ-- INDICATES SECONDARY DAYLIT ZONE
DISTRIBUTION EQUIPMENT	
	DRW DRAW OUT TYPE EQUIPMENT
	VCB VACUUM CIRCUIT BREAKER, RATING AS NOTED
	AIS AIR INTERRUPTER SWITCH AND FUSE
	AIR INTERRUPTER
	FUSE
	PT POWER TRANSFORMER, RATING AS NOTED
	PCB POWER CIRCUIT BREAKER DRAWOUT
	ATS AUTOMATIC TRANSFER SWITCH, SEE SCHEDULE
	A AMMETER
	V VOLTMETER
	CB CIRCUIT BREAKER
	FS FUSED SWITCH
	FS 200AS 200AMP SWITCH
	FS 200AF 200AMP FUSE
	FS 3P 3 POLE
	FS 10,000AIC 10,000 AMPS INTERRUPTING CURRENT
	M UTILITY COMPANY METER



MOUNTING HEIGHT OVER OBSTRUCTION

NO SCALE

1
E1.0

POWER CONTINUED

	DUPLEX RECEPTACLE, FLOOR MOUNTED
	DUPLEX RECEPTACLE, WALL MOUNTED, +18" A.F.F. (U.O.N.)
	RECEPTACLE, WALL MOUNTED HORIZONTALLY, +18" A.F.F. (U.O.N.)
	FOURPLEX RECEPTACLE, WALL MOUNTED, +18" A.F.F. (U.O.N.)
	RECEPTACLE MOUNTED +6" ABOVE COUNTER BACKSPASH. SEE ARCHITECTURAL PLANS FOR REQUIRED MOUNTING HEIGHT PRIOR TO ROUGH-IN.
	PROVIDE (2) DUPLEX RECEPTACLE CEILING MOUNTED LOCATE ADJACENT TO PROJECTOR. FIELD VERIFY EXACT LOCATION PRIOR TO ROUGH-IN.
	RECEPTACLE WITH (2) USB PORTS MOUNTED +6" ABOVE COUNTER BACKSPASH. SEE ARCHITECTURAL PLANS FOR REQUIRED MOUNTING HEIGHT PRIOR TO ROUGH-IN. EATON #TR156.
	SINGLE RECEPTACLE, WALL MOUNTED +18" A.F.F. (U.O.N.)
	SINGLE RECEPTACLE (CLOCK HANGER TYPE) WALL MOUNTED +T-0" A.F.F. (U.O.N.)
	SWITCH CONTROLLED DUPLEX RECEPTACLE +18" U.O.N.
	CONTROLLED FOURPLEX RECEPTACLE +18" U.O.N. (1) DUPLEX (1) HALF HOT CONTROLLED DUPLEX. SEE LIGHTING CONTROL DIAGRAMS FOR FURTHER INFO.
	DUPLEX GROUND FAULT INTERRUPTING RECEPTACLE +18" A.F.F. (U.O.N.)
	DUPLEX RECEPTACLE ON EMERGENCY CIRCUIT +18" A.F.F. (U.O.N.)
	DUPLEX RECEPTACLE IN WEATHERPROOF ENCLOSURE +18" A.F.F. (U.O.N.)
	DUPLEX RECEPTACLE IN WEATHERPROOF "LOOKING" ENCLOSURE +18" A.F.F. (U.O.N.) (SEE TYPICAL DETAILS E3 SERIES SHEETS AND SPECIFICATIONS FOR REQUIRED TYPE).
	DUPLEX RECEPTACLE (ORANGE) ISOLATED GROUND WALL MOUNTED +18" A.F.F. (U.O.N.)
	FOURPLEX RECEPTACLE (ORANGE) ISOLATED GROUND WALL MOUNTED +18" A.F.F. (U.O.N.)
	DUPLEX RECEPTACLE SAFETY TYPE / TAMPER PROOF WALL MOUNTED +18" A.F.F. (U.O.N.)
	DUPLEX COMPUTER RECEPTACLE (GREY), WALL MOUNTED +18" A.F.F. (U.O.N.)
	DUPLEX COMPUTER RECEPTACLE (BLUE) ISOLATED GROUND, SURGE SUPPRESSION, WALL MOUNTED +18" A.F.F. (U.O.N.)
	SINGLE RECEPTACLE 30 AMP, 250V, 4W, GROUNDING, WALL MOUNTED +18" A.F.F. (U.O.N.). FIELD VERIFY EXACT OUTLET CONFIGURATION WITH EQUIPMENT PRIOR TO ROUGH-IN.
	SINGLE RECEPTACLE 50 AMP, 250V, 4W, GROUNDING, WALL MOUNTED +18" A.F.F. (U.O.N.). FIELD VERIFY EXACT OUTLET CONFIGURATION WITH EQUIPMENT PRIOR TO ROUGH-IN.
	SINGLE RECEPTACLE 30 AMP, 125V, 3W, GROUNDING, WALL MOUNTED +18" A.F.F. (U.O.N.). FIELD VERIFY EXACT OUTLET CONFIGURATION WITH EQUIPMENT PRIOR TO ROUGH-IN.
	SINGLE RECEPTACLE 30 AMP, 250V, 3W, GROUNDING, WALL MOUNTED +18" A.F.F. (U.O.N.). FIELD VERIFY EXACT OUTLET CONFIGURATION WITH EQUIPMENT PRIOR TO ROUGH-IN.
	SINGLE RECEPTACLE 30 AMP, 250V, 5W, GROUNDING, WALL MOUNTED +18" A.F.F. (U.O.N.). FIELD VERIFY EXACT OUTLET CONFIGURATION WITH EQUIPMENT PRIOR TO ROUGH-IN.
	SINGLE RECEPTACLE 30 AMP, 480V, 5W, GROUNDING, WALL MOUNTED +18" A.F.F. (U.O.N.). FIELD VERIFY EXACT OUTLET CONFIGURATION WITH EQUIPMENT PRIOR TO ROUGH-IN.
	SINGLE RECEPTACLE 20 AMP, 250V, 5W, GROUNDING, WALL MOUNTED +18" A.F.F. (U.O.N.). FIELD VERIFY EXACT OUTLET CONFIGURATION WITH EQUIPMENT PRIOR TO ROUGH-IN.
	SPECIAL PURPOSES KITCHEN EQUIPMENT RECEPTACLE. SEE KITCHEN PLANS FOR EXACT TYPE. FIELD VERIFY EXACT OUTLET CONFIGURATION WITH EQUIPMENT SUPPLIER PRIOR TO ORDERING. SEE KITCHEN PLANS FOR EXACT MOUNTING HEIGHT.
	DUPLEX RECEPTACLE, WALL MOUNTED ADJACENT TO FLAT PANEL OUTLET, SEE SIGNAL PLAN FOR EXACT LOCATION.
	HEAVY GAUGE STEEL FRAME CORD REEL WITH 20A RECEPTACLE. REELCRAFT PART #L4945-123-1, 12/3 45' 50' CORD.
	MULTI-OUTLET ASSEMBLY, "WIREMOLD" 6-3000 SERIES WITH 20AMP DUPLEX RECEPTACLES ON 18" CENTERS. RECEPTACLES TO BE ALTERNATELY WIRED AND INSULATED GROUNDING CONDUCTOR PROVIDED TO EACH
	JUNCTION BOX, FLOOR MOUNTED
	JUNCTION BOX, CEILING OR WALL MOUNTED
	HD HAND DRYER CONNECTION, SEE ARCHITECTURAL FOR MOUNTING HEIGHT.
	FUSED DISCONNECT SWITCH, WHERE SHOWN NF = NON-FUSED.
	S M MANUAL MOTOR STARTER +48" A.F.F. OR ON EQUIPMENT (U.O.N.)
	M MOTOR CONNECTION, NUMERAL INDICATES HORSEPOWER.
	(AC) MECHANICAL EQUIPMENT TAG (SEE MECHANICAL DRAWINGS FOR DESCRIPTION)
	CONDUIT AND WIRE, CONCEALED IN CEILING OR WALL
	CONDUIT AND WIRE, CONCEALED IN OR UNDER FINISHED FLOOR OR UNDER FINISHED GRADE
	FC FLEXIBLE CONDUIT CONNECTION
	BRANCH CIRCUIT HOMERUN TO PANEL, SLASHES INDICATE NUMBER OF CONDUCTORS. EQUIPMENT GROUND WIRE NOT INDICATED U.O.N. #12 CONDUCTORS ARE MINIMUM, NO HASH MARKS = MIN (2) #12
	3/4" CONDUIT STUBBED FROM DEVICE TO ABOVE ACCESSIBLE CEILING
	BRANCH CIRCUIT HOMERUN, NUMBER INDICATES INCREASED CONDUCTOR SIZE, CONDUCTORS SHALL REMAIN AS INDICATED FOR SIZE THROUGHOUT THE ENTIRE CIRCUIT.
	PB PANELBOARD, SURFACE MOUNTED.
	PB PANELBOARD, RECESSED
	T STEP-DOWN TRANSFORMER
	DS DISTRIBUTION SWITCHBOARD
	SR SURFACE MOUNTED RACEWAY SINGLE SECTION SERIES, NON METALLIC (WHITE)
	SR SURFACE MOUNTED RACEWAY TWO SECTION SERIES, NON METALLIC (WHITE)
	SR SURFACE MOUNTED RACEWAY THREE SECTION SERIES, NON METALLIC (WHITE)



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GENERAL PROJECT NOTES:

- UNLESS WHERE OTHERWISE NOTED, ALL WORK INDICATED ON THESE DRAWINGS SHALL BE CONSIDERED NEW WORK.
- UNLESS WHERE OTHERWISE NOTED, ALL DIMENSIONS ARE TO BE CENTERLINE OF THE DEVICE.
- "GENERAL NOTES" SHOWN ON AN INDIVIDUAL DRAWING APPLY TO ALL WORK SHOWN ON THAT SHEET. "KEY NOTES" ONLY APPLY TO SPECIFIC ITEMS WHERE ANNOTATED AT SPECIFIC LOCATIONS. SOME KEY NOTES MAY NOT APPLY TO ANY SPECIFIC ITEMS.
- FOR TWO STORY BUILDING CONSTRUCTION, NO CONDUITS SHALL BE ROUTED HORIZONTALLY WITHIN THE FLOOR SLAB OF THE SECOND FLOOR.
- UNLESS SPECIFICALLY SHOWN ON THESE PLANS, NO STRUCTURAL MEMBER SHALL BE CUT, NEITHER DRILLED NOR SLOTTED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER AND THE DIVISION OF THE STATE ARCHITECT.

GENERAL DEMOLITION NOTES:

- ALL ELECTRICAL EQUIPMENT, EXPOSED RACEWAY AND CONDUIT, OUTLET BOXES AND RINGS, AND DEVICES ARE TO BE REMOVED, EXCEPT WHERE SHOWN TO REMAIN. EXISTING WIRING, WHETHER EXPOSED, IN CONDUIT OR RACEWAY IS TO BE REMOVED TO THE GREATEST EXTENT POSSIBLE.
- THE ELECTRICAL CONTRACTOR IS TO DIRECT THE REMOVAL OF THE ABOVE LISTED WORK.

MEP COMPONENT ANCHORAGE NOTE:

- ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA- APPROVED CONSTRUCTION DOCUMENTS. THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2019 CBC SECTIONS 1617A.1.15 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTERS 13, 26, AND 30.
- ALL PERMANENT EQUIPMENT AND COMPONENTS.
 - TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES HAVING A FLEXIBLE CABLE.
 - TEMPORARY, MOVABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA.
 - THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE BUT NEED NOT DEMONSTRATE DESIGN COMPLIANCE WITH THE REFERENCES NOTED ABOVE. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS:
 - COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVING A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.
 - COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.
- THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-16 SECTION 13.3 AS DEFINED IN ASCE 7-16 SECTIONS 13.6.5, 13.6.6, 13.6.7, 13.6.8, AND 2019 CBC, SECTIONS 1617A.1.24, 1617A.1.25 AND 1617A.1.26. THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE (E.G., OSHPD OPM FOR 2019 CBC OR LATER), COPIES OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF AND DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEMS. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS. MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

- MP MD PP E - OPTION 1: DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.
- MP MD PP E - OPTION 2: SHALL COMPLY WITH THE APPLICABLE OSHPD PRE-APPROVED (OPM#) # _____

FIRE RATED ASSEMBLIES NOTE:

- REFER TO ARCHITECTURAL DRAWINGS FOR EXACT DESCRIPTION AND DETAIL OF ALL FIRE RATED ASSEMBLIES.

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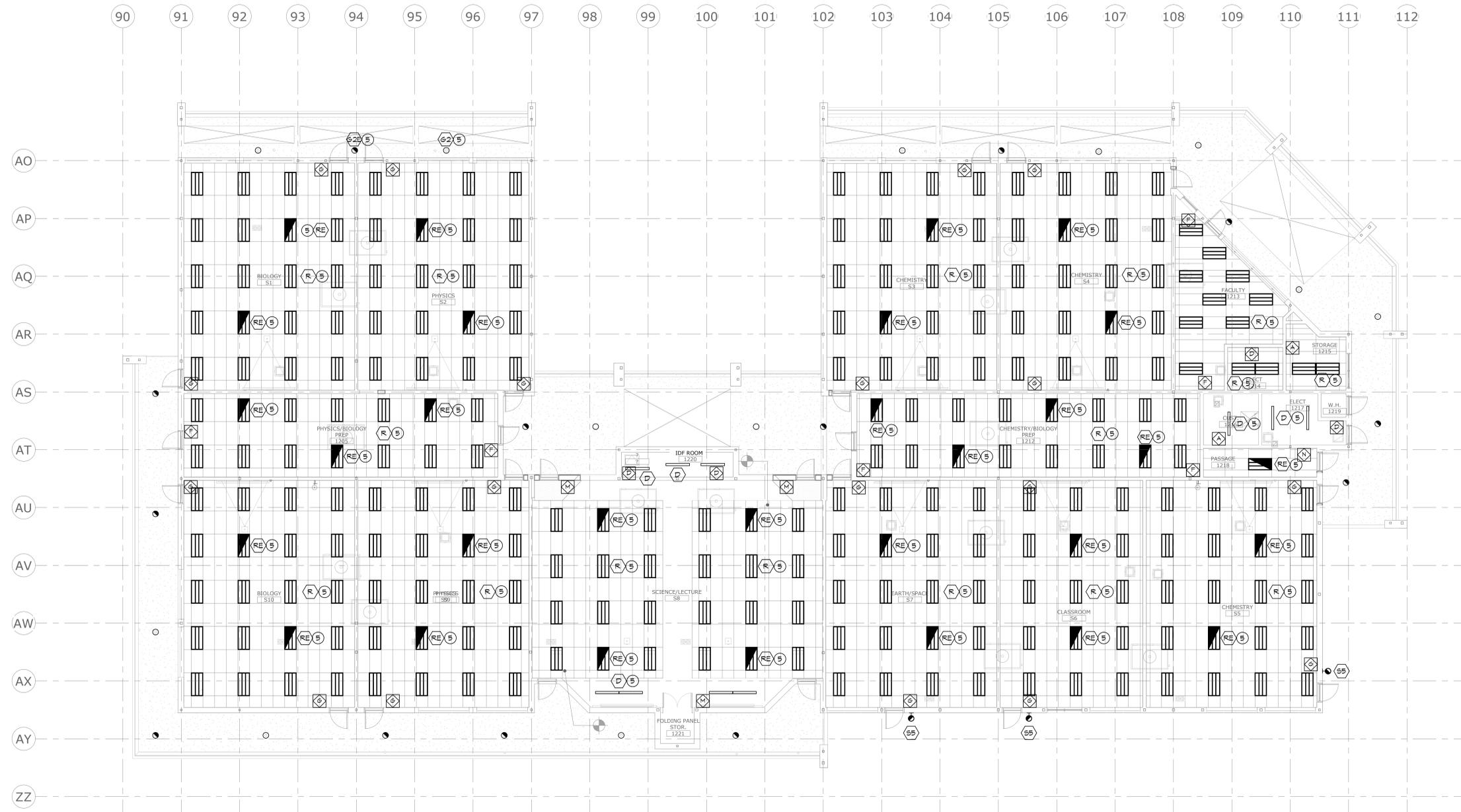
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GENERAL NOTES:

1. REFERENCE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF ALL LIGHTING FIXTURES.
2. REFERENCE E2 SERIES SHEETS FOR ALL FIXTURE TYPES AND FOR TYPICAL DETAILS.
3. REFERENCE E0 SERIES SHEETS FOR TYPICAL CONDUIT AND BACKBOX INSTALLATION DETAILS.
4. LETTERS IN OR ADJACENT TO EACH FIXTURE OR FIXTURE ROW INDICATES SWITCH AND/OR OCCUPANCY SENSOR WHICH CONTROLS THE LIGHTING FIXTURE.
5. CIRCUIT HOMERUNS ARE INDICATED TO SHOW THE LOCATION AND NUMBER OF CIRCUITS TO BE GROUPED TOGETHER.
6. PROVIDE MINIMUM 3/4" CONDUIT AND #12 CIRCUIT CONDUCTORS AS REQUIRED TO CONNECT EACH LIGHTING FIXTURES TO THEIR INDICATED CONTROL DEVICES. (U.O.N.)

KEY NOTES:

- 1 SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT.
- 2 #12 (HOT), 1 #10 (NEUTRAL), 1 #12 (GND), 3/4".
- 3 #12 (HOT), 1 #10 (NEUTRAL), 1 #12 (GND), 3/4".
- 4 #12 (HOT), 2 #10 (NEUTRAL), 1 #12 (GND), 3/4".
- 5 FIXTURES TO CONNECT TO EXISTING LIGHTING CIRCUIT.



LEVEL 1 FLOOR PLAN - LIGHTING 1

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LEVEL 1 FLOOR PLAN - LIGHTING

E2.1

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Mark	Approved Manufacturer's (See Key Note No. 1)	Catalog Series Type (See Key Note No. 2)	FIXTURE							Lamps Watts	LAMP		MOUNTING					Description
			Incandescent	Fluorescent	Mini Halide	High Pressure Sodium	LED	Volts	No.		Type	Recessed Ceiling	Recessed Wall	Recessed Wall	Surface Wall	Other		
D	LITHONIA	CLX SERIES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	120	42	<input type="checkbox"/>	4" STRIP LIGHT WITH ROUND DIFFUSE LENS, MINIMUM 3000 LUMENS, 4000 KELVIN, 0-10V DIMMING.							
	COLUMBIA	MPS SERIES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	208										
	PHILIPS	LF410R SERIES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	277										
	OR EQUAL (1)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	480										
G2	LIGHTOLIER	D4A SERIES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	120	18	<input type="checkbox"/>	MAXIMUM 4-7/8" DEEP DOWNLIGHT MAXIMUM 4" APERTURE, WITH RETRO ROUND ACRYLIC DECORATIVE LED TRIM KIT, SUITABLE FOR NON-ACCESSIBLE CEILINGS, MINIMUM 2000 LUMENS, 4000K, 0-10V DIMMING.							
	OR EQUAL (1)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	208										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	277										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	480										
G2E	LIGHTOLIER	D4A SERIES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	120	18	<input type="checkbox"/>	MAXIMUM 4-7/8" DEEP DOWNLIGHT MAXIMUM 4" APERTURE, WITH RETRO ROUND ACRYLIC DECORATIVE LED TRIM KIT, SUITABLE FOR NON-ACCESSIBLE CEILINGS, MINIMUM 2000 LUMENS, 4000K, 0-10V DIMMING, FULL OUTPUT EMERGENCY BATTERY DRIVER.							
	OR EQUAL (1)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	208										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	277										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	480										
R	LITHONIA	2BLT4R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	120	46	<input type="checkbox"/>	2X4' RETROFIT T-GRID FIXTURE WITH CENTER BASKET/CURVED DIFFUSER, FITS IN EXISTING FIXTURE HOUSING, MINIMUM 4700 LUMENS AT A CCT OF 4000 KELVIN, DRIVER VOLTAGE UNIVERSAL, 0-10v DIMMING.							
	PHILIPS	EVOKIT 2X4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	208										
	OR EQUAL (1)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	277										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	480										
RE	LITHONIA	2BLT4R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	120	46	<input type="checkbox"/>	2X4' RETROFIT T-GRID FIXTURE WITH CENTER BASKET/CURVED DIFFUSER, FITS IN EXISTING FIXTURE HOUSING, MINIMUM 4700 LUMENS AT A CCT OF 4000 KELVIN, DRIVER VOLTAGE UNIVERSAL, 0-10v DIMMING, FULL OUTPUT EMERGENCY BATTERY DRIVER.							
	PHILIPS	EVOKIT 2X4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	208										
	OR EQUAL (1)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	277										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	480										
SS	HUBBELL	GEOPAK SERIES TRP2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	120	27	<input type="checkbox"/>	TRAPEZOID ARCHITECTURAL WALLPACK, MINIMUM 2000 LUMEN AT A CCT OF 4000 KELVIN, TYPE 3 DISTRIBUTION, WET LOCATION LISTED, MOTION SENSOR / DIMMING OPTION, FINISH METALLIC SILVER / ALUMINUM.							
	LITHONIA	WST LED SERIES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	208										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	277										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	480										

KEY NOTES:

- (1) IN ORDER FOR EQUAL TO BE APPROVED, LIGHT FIXTURE MUST BE SIMILAR PHYSICALLY, HAVE A SIMILAR WATTAGE AND LIGHTING FIXTURE REPRESENTATIVE MUST PROVIDE A LIGHTING CALCULATION SHOWING THAT THE EQUAL PRODUCES A SIMILAR NUMBER OF FOOTCANDLES AS THE SPECIFIED FIXTURE. PROVIDE SUBSTITUTION REQUEST AS PER SPECIFICATIONS.

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**LIGHTING FIXTURE
SCHEDULE**

E2.2

Project Number

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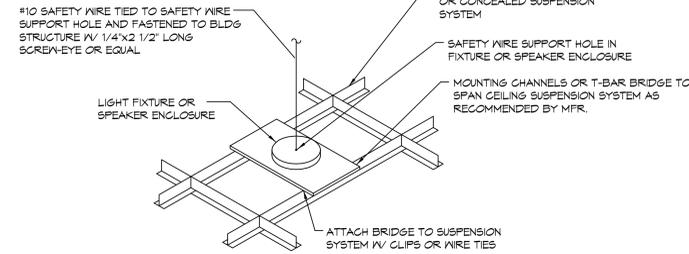


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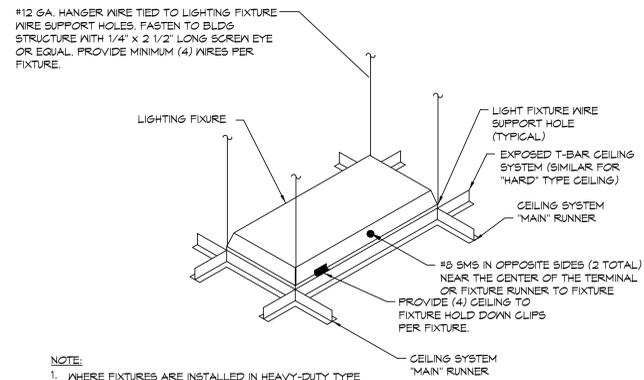
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LUMINAIRE AND SPEAKER ENCLOSURE SEISMIC RESTRAINT DETAIL 1
NO SCALE

1
E2.3



NOTE:
1. WHERE FIXTURES ARE INSTALLED IN HEAVY-DUTY TYPE LAY-IN CEILING AND THE TOTAL WEIGHT OF THE FIXTURE IS LESS THAN 50 LBS. REDUCE THE QUANTITY OF HANGER WIRES TO (2) SLACK WIRES AT DIAGONAL CORNERS.
2. REFERENCE ARCHITECTURAL PLANS FOR ADDITIONAL CEILING ANCHORAGE REQUIREMENTS.

FLUORESCENT FIXTURE SEISMIC RESTRAINT DETAIL 1
NO SCALE

2
E2.3

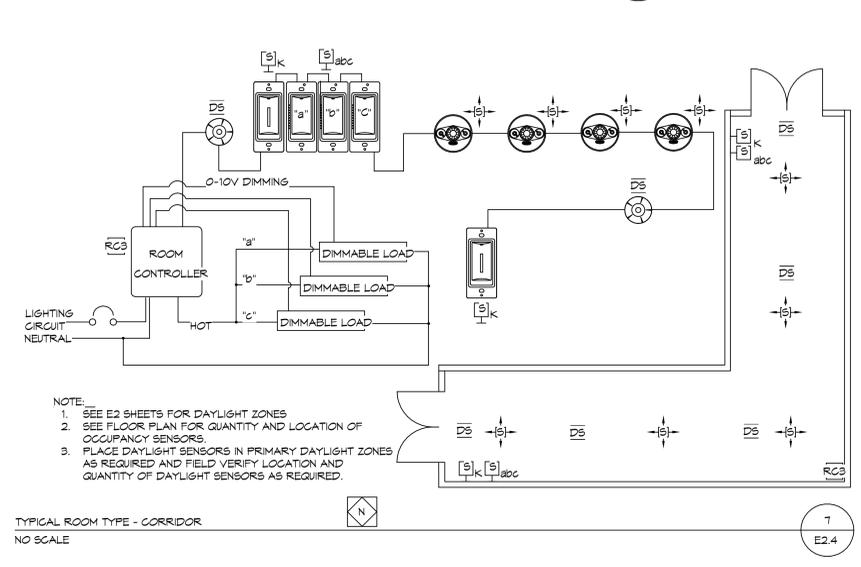
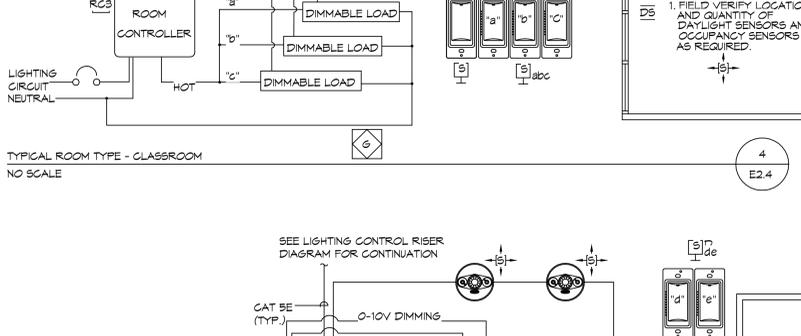
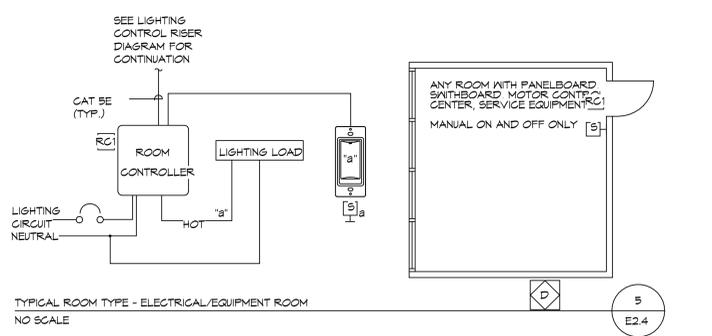
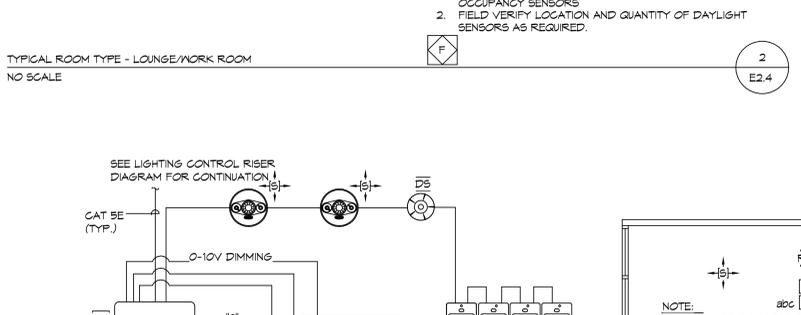
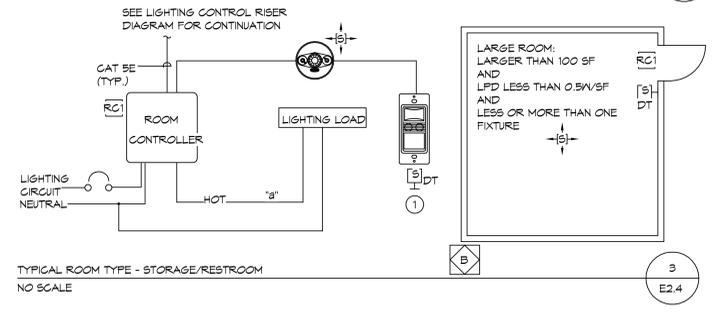
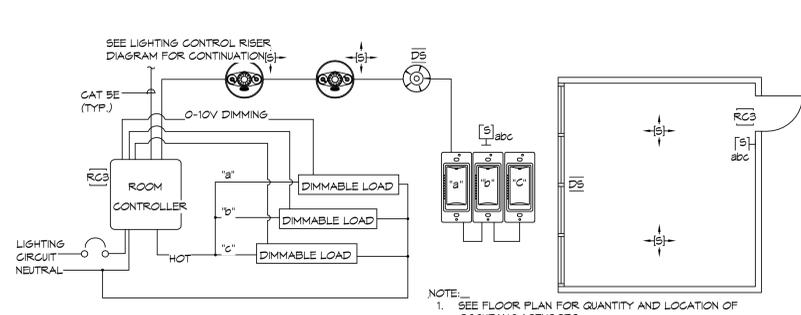
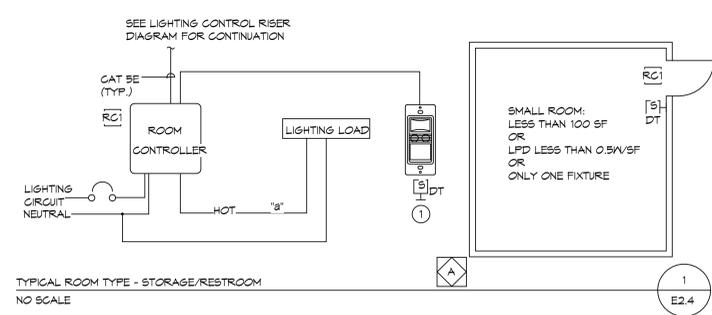
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- SYMBOL LEGEND**
- [S] WALL MOUNTED MANUAL ON AND OFF SWITCH +48" U.O.N.
 - [S] DT WALL MOUNTED DUAL TECH OCCUPANCY SENSOR WITH MANUAL ON AND OFF 48" U.O.N.
 - [S] DT CEILING MOUNTED OCCUPANCY SENSOR (DUAL TECHNOLOGY)
 - [S] WALL MOUNTED OCCUPANCY SENSOR (DUAL TECH) +84" U.O.N.
 - [RC1] SINGLE CIRCUIT ROOM CONTROLLER FOR ROOMS WITH ONE DIMMING ZONE.
 - [RC2] SINGLE CIRCUIT ROOM CONTROLLER FOR ROOMS WITH TWO DIMMING ZONES.
 - [RC3] SINGLE CIRCUIT ROOM CONTROLLER FOR ROOMS WITH THREE DIMMING ZONES.
 - [FL] PLUS LOAD CONTROLLER
 - [DS] DAYLIGHT SENSOR
 - [H] 4S 4 SCENE DIMMING CONTROL STATION
 - [S] K MANUAL ON AND OFF KEY SWITCH
 - [S] a MAIN ENTRY MANUAL ON AND OFF WITH DIMMER FOR ZONE 'a'
 - [S] ab MAIN ENTRY MANUAL ON AND OFF WITH DIMMER FOR ZONE 'a'/'b'
 - [S] abc MAIN ENTRY MANUAL ON AND OFF WITH DIMMER FOR ZONE 'a'/'b'/'c'
 - [S] abc MAIN ENTRY MANUAL DIMMERS FOR ZONE 'a', 'b' & 'c'

- GENERAL NOTES**
1. REFERENCE SPECIFICATION SECTION 260923 DIGITAL LIGHTING CONTROL SYSTEM FOR ADDITIONAL SCOPE OF WORK.
 2. ITEMS [RC1][RC2][RC3][FL] TO BE WALL MOUNTED ABOVE THE ROOM ENTRY DOOR, ABOVE THE CEILING IN ALL ROOMS WITH T-BAR CEILING.
 3. ITEMS [RC1][RC2][RC3][FL] TO BE LOCATED WITHIN A 34" x 34" RECESSED ENCLOSURE WITH HINGED LOCKING COVER LOCATED ABOVE THE ROOM ENTRY DOOR IN ALL ROOMS WITH INACCESSIBLE CEILING.
 4. ALL 0-10V WIRING AND CAT 5E WIRING MAY BE INSTALLED AS OPEN WIRE WHERE ABOVE ACCESSIBLE CEILING. WHERE ABOVE INACCESSIBLE OR EXPOSED CEILING IT SHALL BE INSTALLED IN CONDUIT.
 5. 'S' WHERE CEILING HEIGHT EXCEED 11'-0" OR ROOM HAS EXPOSED CEILING PROVIDE 'S' TYPE SENSOR MOUNTED ON WALL IN PLACE OF CEILING SENSOR.
 6. REFERENCE FOR LIGHTING ON EMERGENCY SYSTEM.
 7. WHERE OCCUPANCY SENSORS AND DAYLIGHT SENSORS ARE SHOWN ON PLAN IN SPECIFIC ROOMS, FOLLOW FLOOR PLAN FOR QUANTITY AND LOCATION OF SENSOR LOCATIONS.
- KEY NOTES:**
1. PROVIDE KEYSWITCH FOR ALL RESTROOMS.

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LIGHTING CONTROL DIAGRAMS

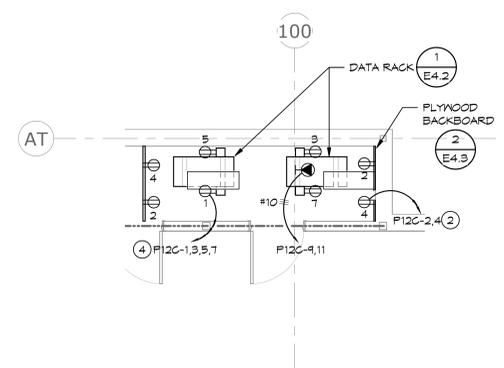
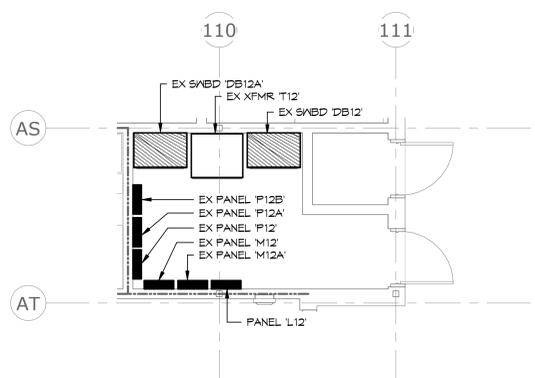
E2.4

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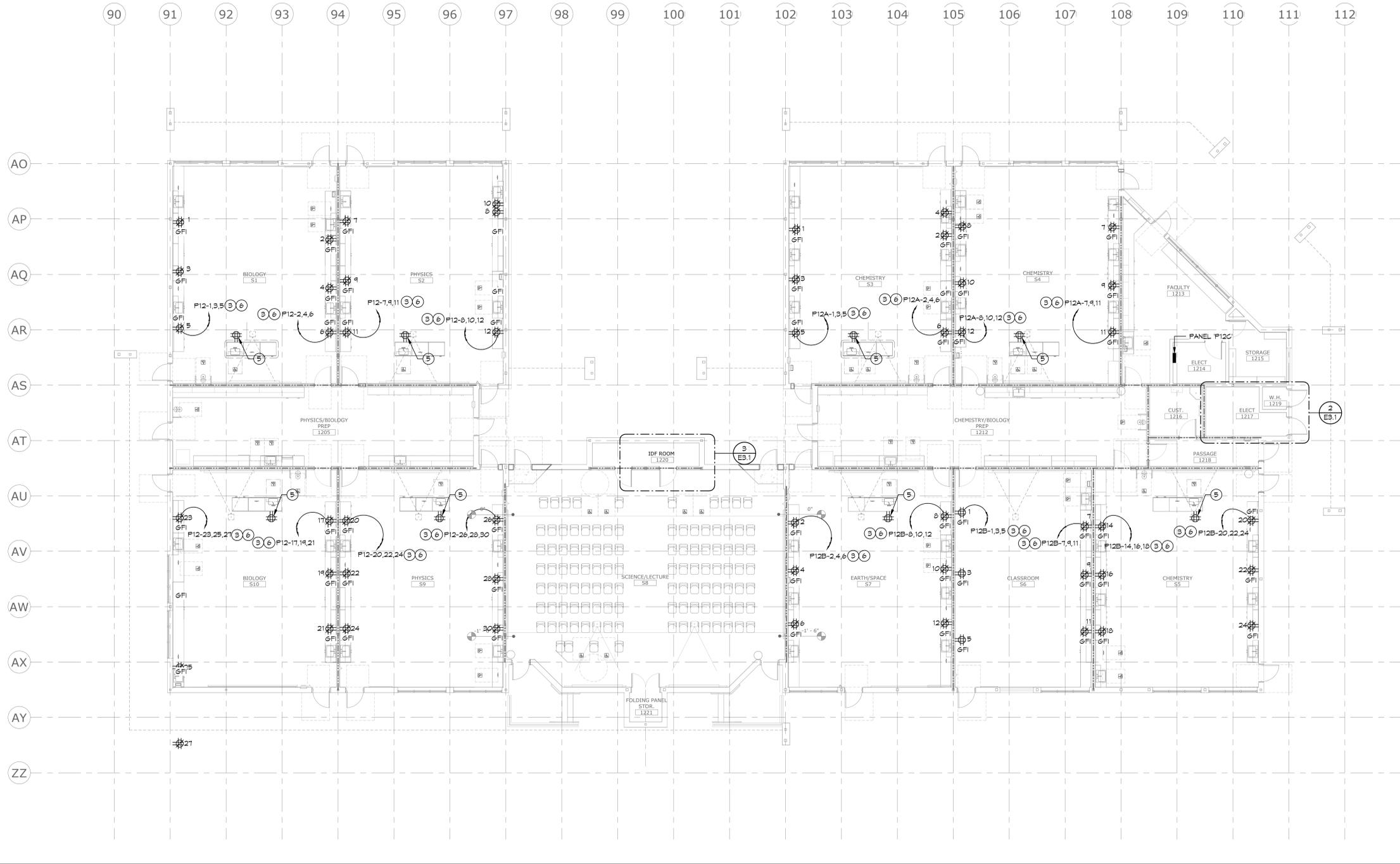


ENLARGED ELECTRIC ROOM
NO SCALE

2
E3.1

ENLARGED IDF ROOM
NO SCALE

3
E3.1



- GENERAL NOTES:**
- REFERENCE ARCHITECTURAL INTERIOR ELEVATIONS FOR EXACT LOCATION OF ALL WALL MOUNTED POWER DEVICES WHERE INDICATED AT MOUNTING HEIGHTS OTHER THAN +10'.
 - NUMBERS ADJACENT TO EACH POWER DEVICE INDICATES THE CIRCUIT NUMBER TO WHICH THE DEVICE IS TO BE CONNECTED.
 - CIRCUIT HOMERUNS ARE INDICATED TO SHOW THE LOCATION AND NUMBER OF CIRCUITS TO BE GROUPED TOGETHER.
 - PROVIDE MINIMUM 3/4" CONDUIT AND #12 CIRCUIT CONDUCTORS AS REQUIRED TO CONNECT EACH POWER DEVICE TO THEIR INDICATED CIRCUIT (U.C.N.).
 - FIELD VERIFY EXACT ROUTING LOCATION FOR CONCEALED CONDUITS AND RECEPTACLES PRIOR TO ROUGH-IN.

- KEY NOTES:**
- FIELD VERIFY EXACT LOCATION PRIOR TO ROUGH-IN.
 - 2 #12 (HOT), 1 #10 (NEUTRAL), 1 #12 (GND), 3/4" C.
 - 3 #12 (HOT), 1 #10 (NEUTRAL), 1 #12 (GND), 3/4" C.
 - 4 #12 (HOT), 2 #10 (NEUTRAL), 1 #12 (GND), 3/4" C.
 - REMOVE EXISTING RECEPTACLE FROM FACE OF TEACHING ISLAND AND RE-INSTALL AFTER THE FURNITURE HAS BEEN RENOVATED.
 - CIRCUITS SHOWN ARE BASED OFF OF AS-BUILT DRAWINGS. THE NEW RECEPTACLES SHALL BE CONNECTED TO THE DEMOLISHED CIRCUITS IN THE DEMOLISHED PENINSULAS. FIELD VERIFY EXACT CIRCUITS TO BE UTILIZED.

PROJECT No. :Project Number
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ISSUE No.	DATE	DESCRIPTION	REVISION No.	DATE	DESCRIPTION

BACKBOX AND RING LEGEND	
TYPE	DESCRIPTION
B1	4 11/16" square 2 1/8" deep box with single gang ring.
B2	4 11/16" square 2 1/8" deep box with dual gang ring.
B3	4" square 1 1/2" deep box with single gang ring.
B4	Single gang box, 2 1/8" deep.
B5	4-11/16" Square 3" deep box with dual gang ring.

C1	Provided by 21 10 00 contractor.
C2	Provided by 21 21 00 contractor.
C3	Provided by 21 20 00 contractor.
C4	Provided by 21 51 16 contractor.
C5	Provided by 23 13 00 contractor.
C6	Provided by 23 23 00 contractor.
C7	Provided by xx xx xx contractor.

FACEPLATE LEGEND	
TYPE	DESCRIPTION
AR	As required to accommodate the number of ports designated.
BP	Blank faceplate.

C1	Provided by 21 10 00 contractor.
C2	Provided by 21 21 00 contractor.
C3	Provided by 21 20 00 contractor.
C4	Provided by 21 51 16 contractor.
C5	Provided by 23 13 00 contractor.
C6	Provided by 23 23 00 contractor.
C7	Provided by xx xx xx contractor.

CONDUIT / RACEWAY LEGEND	
TYPE	DESCRIPTION
3/4-S	3/4" conduit stubbed from box into accessible ceiling space, unless detailed otherwise on drawings.
1-S	1" conduit stubbed from box into accessible ceiling space, unless detailed otherwise on drawings.
1 1/4-S	1 1/4" conduit stubbed from box into accessible ceiling space, unless detailed otherwise on drawings.

TECHNOLOGY SYMBOL LEGEND				
SYMBOL	DESCRIPTION	BACKBOX & RING	FACE PLATE	CONDUIT / RACEWAY
	Single port data outlet, +18" A.F.F. (U.O.N.)	Type B1	Type AR	Type 1-S
	Dual port data outlet, +18" A.F.F. (U.O.N.)	Type B1	Type AR	Type 1-S
	Triple port data outlet, +18" A.F.F. (U.O.N.)	Type B1	Type AR	Type 1-S
	Quad port data outlet, +18" A.F.F. (U.O.N.)	Type B1	Type AR	Type 1-S
	Single port data outlet with single port voice outlet, +18" A.F.F. (U.O.N.)	Type B1	Type AR	Type 1-S
	Dual port data outlet with single port voice outlet, +18" A.F.F. (U.O.N.)	Type B1	Type AR	Type 1-S
	Dual port data outlet with dual port voice outlet, +18" A.F.F. (U.O.N.)	Type B1	Type AR	Type 1-S
	Triple port data outlet with single port voice outlet, +18" A.F.F. (U.O.N.)	Type B1	Type AR	Type 1-S
	Local origination with dual port data (D) and single port voice (V) outlet, +18" A.F.F. (U.O.N.)	Type B1 (D/V) Type B5 (LO) side by side	Type AR (D/V) Type C3 (LO)	Type 1-S (D/V) Type 1 1/4-S (LO)
	Local origination with triple port data (D) and single port voice (V) outlet, +18" A.F.F. (U.O.N.)	Type B1 (D/V) Type B5 (LO) side by side	Type AR (D/V) Type C3 (LO)	Type 1-S (D/V) Type 1 1/4-S (LO)
	Same device as required on legend, mounted +6" above backplash (U.O.N.)	Same as required for device indicated on legend.	Same as required for device indicated on legend.	Same as required for device indicated on legend.
	Same device as required on legend, except surface mounted box.	Same as required for device indicated on legend.	Same as required for device indicated on legend.	Same as required for device indicated on legend.
	Same device as required on legend, except in floor box.	Floorbox per E3 series drawings.	Same as required for device indicated on legend.	Same as required for device indicated on legend.
	Dual port data outlet, mounted in ceiling at projector location.	Type B1 Provide Box with Ceiling Grid Hanger.	Type AR	Type 1-S Not required in accessible ceiling.
	Dual port data outlet, wall mounted at projector location. Mount next to projector. See floor plans.	Type B1	Type C2 or C3	Type 1-S
	Dual port data outlet for Audio-Visual equipment in accessible ceiling.	Type B1 Provide Box with Ceiling Grid Hanger.	Type C1	Type 3/4-S
	Dual port data outlet for Audio-Visual Equipment, wall mounted. See AV Details for outlet location.	Type B1	Type C1	Type 3/4-S
	Ceiling Mounted Projector Location.	Type B1 See Detail	Type C3	Type 1 1/4-S
	Single port data outlet at wireless access point location mounted in accessible ceiling (U.O.N.)	See detail	Type C1	Not required in accessible ceiling.
	Audio-Visual Control Panel with single port data outlet @+48" AFF (U.O.N.). Refer to Drawing Details.	See Detail	Type C2 or C3	Type 1-S
	Card reader for single door @+48" AFF (U.O.N.)	See Details	Type C6	See Details
	Card reader for double door @+48" AFF (U.O.N.)	See Details	Type C6	See Details

COMMUNICATION / SECURITY SYMBOL LEGEND				
SYMBOL	DESCRIPTION	BACKBOX & RING	FACE PLATE	CONDUIT / RACEWAY
	Telephone outlet with staff type phone, +18" A.F.F. (U.O.N.) (N indicates wall mount at +48" A.F.F.) Height per detail 1/E1.0	Type B3	Type C1	Type 3/4-S
	Telephone outlet with classroom type phone, +18" A.F.F. (U.O.N.) (N indicates wall mount at +48" A.F.F.) Height per detail 1/E1.0	Type B3	Type C1	Type 3/4-S
	Direct Phone Trunk outlet, +18" A.F.F. (U.O.N.) (N indicates wall mount at +48" A.F.F.)	Type B3	Type C1	Type 3/4-S
	Telephone outlet in floorbox.	Floorbox per E3 series drawings	Type C1	Type 3/4-S
	Analog intercom speaker recessed in ceiling.	Type C4	Type C4	Type 3/4-S
	Analog intercom speaker, recessed in wall, +8'-0" A.F.F. (U.O.N.)	Type C4, installed by electrical contractor.	Type C4 IF Type C1	Type 3/4-S
	Analog intercom speaker, surface mount on interior wall, +8'-0" A.F.F. (U.O.N.)	Type B3	Type C4 IF Type C1	Type 3/4-S
	Analog intercom horn recessed in exterior wall @ +8'-0" AFF (U.O.N.) A=Page Zone	Type C4, installed by electrical contractor.	Type C4 IF Type C1	Type 3/4-S
	Volume control for intercom system, mounted at +48" A.F.F. (U.O.N.) Height per detail 1/E1.0	Type B3	Type C4 IF Speakers/C1	Type 3/4-S
	Existing IP clock speaker combo	Not required.	Not required.	Not required.
	Sound system speaker, recessed in wall, +10'-0" A.F.F. (U.O.N.) A= speaker type, see specifications for complete descriptions.	Type C3, installed by electrical contractor.	Type C3	Type 1-S
	Sound system speaker wall mounted, height per plans (U.O.N.). (A= equals speaker type, see specifications for complete description)	Type B1	Type C3	Type 1-S
	Sound system speaker ceiling mounted, (A= equals speaker type, see specifications for complete description)	Type C3	Type C3	Type 1-S
	Microphone outlet wall mounted at +18" A.F.F. (U.O.N.). Number indicates quantity of outlets. WP indicates weatherproof enclosure.	Type B1	Type C3	Type 1-S
	Same device as required on legend, except in floor box. Number indicates quantity of outlets.	Floorbox per E3 series drawings.	Same as required for device indicated on legend.	Same as required for device indicated on legend.
	Same device as required on legend, except mounted in ceiling. Number indicates quantity of outlets.	Same as required for device indicated on legend.	Same as required for device indicated on legend.	Same as required for device indicated on legend.
	Security keypad wall mounted at +48" A.F.F. (U.O.N.) Height per detail 1/E1.0	Type B2	Type C5	Type 3/4-S
	Security motion sensor ceiling mounted.	Type B3	Type C5	Type 3/4-S
	Security motion sensor wall mounted at 8" below ceiling, or +10'-0" A.F.F. (U.O.N. whichever is lower).	Type B3	Type C5	Type 3/4-S
	Security door contact.	Type B3	Type C5	Type 3/4-S
	Surveillance camera, exterior type. Height as shown on floor plans.	Type B1	Type C6 (Weathertight)	Type 1-S
	Access control card reader. Refer to details on E4 series sheets for additional information.	See details on E4 Series Sheets	See details on E4 Series Sheets	See details on E4 Series Sheets
	Junction Box in ceiling for access controls at door. Refer to details on E4 Series sheets for additional information.	See details on E4 Series Sheets	See details on E4 Series Sheets	See details for conduit requirements for all door types.
	Camera Schedule Designator. See detail sheets for camera schedule.	N/A	N/A	N/A
	J-Box for Future Low-Voltage Devices @+18" AFF (U.O.N.)	Type B1	Blank Plate Color to Match	Type 1-S
	Conduit sleeve through wall, above accessible ceiling.	Not required.	Not required.	(1) 3"C, for open low voltage wiring.
	Conduit sleeve through wall, above accessible ceiling.	Not required.	Not required.	(1) Conduit for open low voltage wiring, size as indicated.
	Conduit sleeve through wall, above accessible ceiling.	Not required.	Not required.	Multiple Conduits for open low voltage wiring, size and quantity as indicated.
	Conduit stubbed above accessible ceiling.	Not required.	Not required.	Conduit for open low voltage wiring. Refer to legend for size.
	Conduit stubbed above accessible ceiling.	Not required.	Not required.	(1) Conduit for open low voltage wiring, size as indicated.
	Conduit stubbed above accessible ceiling.	Not required.	Not required.	Conduit for open low voltage wiring, size and quantity as indicated.

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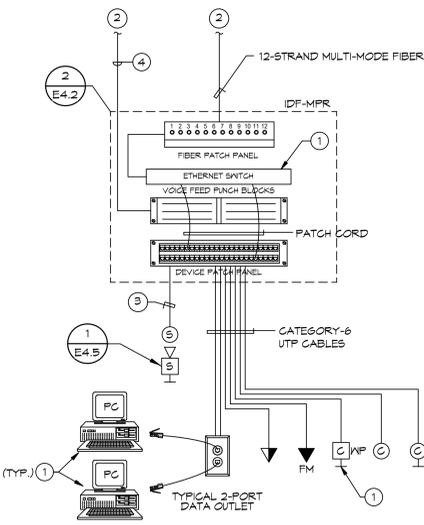
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GENERAL NOTES:

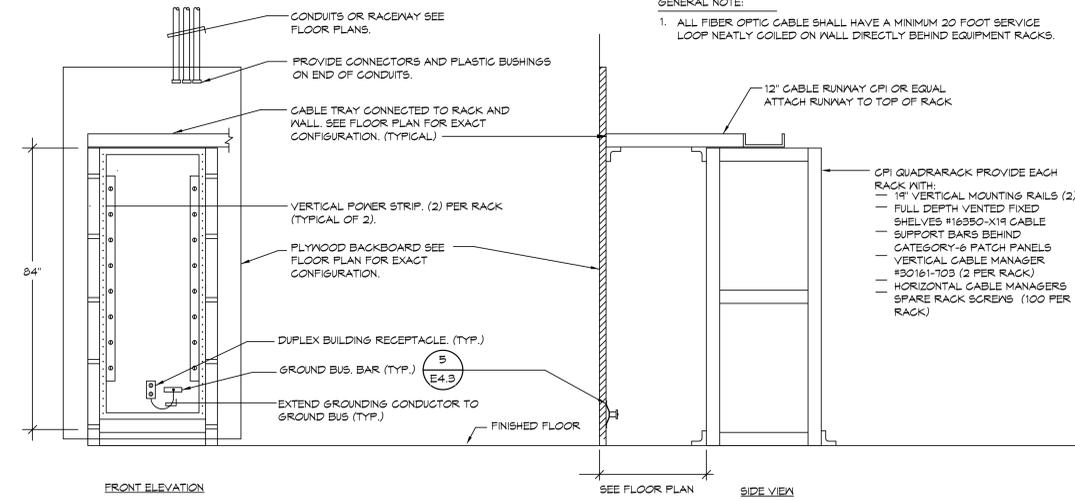
- ALL CONDUITS WHICH ARE REQUIRED AS A PART OF SYSTEMS SPECIFIED FOR COMMUNICATIONS, TELEPHONE, INTERCOM, CLOCK FIRE ALARM, SECURITY, SOUND SYSTEMS, DATA NETWORKING, OR AUDIO-VISUAL SYSTEMS SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
- THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONDUIT REQUIREMENTS WITH EACH SYSTEM SUPPLIER PRIOR TO BID TO DETERMINE SPECIAL CONDUIT SYSTEM REQUIREMENTS.
- THE ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT SLEEVES FOR ALL OPEN CABLE INSTALLATIONS THROUGH RATED WALLS, BLOCK WALLS AND WHERE SHOWN ON THE DRAWINGS. PROVIDE CONDUIT FROM EACH BUILDING MAIN TERMINATION CABINET OR BACKBOARD TO THE NEAREST ACCESSIBLE CEILING FOR ACCESS INTO ALL ELECTRICAL OR COMMUNICATIONS ROOMS.
- ALL CONDUIT, BOXES, AND RINGS SHALL BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR.
- ALL BLANK PLATES SHALL BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR. (UNLESS OTHERWISE NOTED)
- ALL CONDUITS SHALL BE FURNISHED WITH PULL STRINGS BY ELECTRICAL CONTRACTOR. COMMUNICATION CONTRACTOR TO PROVIDE POLYARIMIO PULL TAPE WITH NEW CABLING INTO ALL CONDUITS BETWEEN BUILDINGS. SEE SPECIFICATIONS FOR REQUIREMENTS.
- CONTRACTOR TO REVIEW ARCHITECTURAL CEILING PLANS TO DETERMINE LOCATIONS OF ACCESSIBLE CEILING PRIOR TO BID.
- (211000) NUMBERS INDICATE MATCHING SPECIFICATION SECTION RESPONSIBLE FOR THIS WORK.
- IN ADDITION TO THE ABOVE REQUIREMENTS, THE FOLLOWING REQUIREMENTS SHALL APPLY TO ALL DATA, VOICE, AUDIO-VISUAL, SECURITY AND CLOCK CONDUITS:
- FLEXIBLE METAL CONDUIT MAY BE USED ONLY WHERE REQUIRED AT BUILDING SEISMIC AND/OR EXPANSION JOINTS.
- ALL UNDERGROUND CONDUITS SHALL BE PROVIDED WITH MINIMUM 24" RADIUS ELBOWS.
- NO LENGTH OF CONDUIT SHALL BE INSTALLED TO EXCEED 150 FEET BETWEEN PULL BOXES, OR POINTS OF CONNECTION, UNLESS WHERE SPECIFICALLY DETAILED ON THE DRAWINGS.
- NO LENGTH OF CONDUIT SHALL BE INSTALLED TO EXCEED TWO 90 DEGREE BENDS BETWEEN PULL BOXES, OR POINTS OF CONNECTION, UNLESS WHERE SPECIFICALLY DETAILED ON THE DRAWINGS.

KEY NOTES:

- 1) JUNCTION BOXES FOR VOICE/DATA AND AUDIO-VISUAL CONNECTIONS MUST BE SEPARATE. AUDIO-VISUAL JUNCTION BOX OR BOXES SHALL BE FURNISHED AS SHOWN IN THE DRAWING DETAILS. PROVIDE (1) OR (2) TYPE B2 PER DETAILS.
- 2) DATA CABLING AND FACEPLATE FOR SYMBOL FURNISHED AND INSTALLED BY 211000 CONTRACTOR.
- 3) BACKBOX AND DEVICE TO BE FURNISHED AND INSTALLED BY 211000 CONTRACTOR.
- 4) SPEAKER OR HORN BACKBOX AND DEVICE TO BE FURNISHED BY 211000 CONTRACTOR. BACKBOX TO BE INSTALLED BY THE DIVISION 26 CONTRACTOR.
- 5) IF DIGITAL CAMERA LOCATIONS SHALL BE FURNISHED WITH (3) DATA CAT6A CABLES TERMINATED ON SURFACE MOUNT JACK. INSTALLED IN JUNCTION BOX. DATA CONNECTIONS FURNISHED AND INSTALLED BY 211000 CONTRACTOR. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.



- GENERAL NOTES:**
- UNLESS OTHERWISE NOTED ALL ITEMS ARE CONTRACTOR FURNISHED AND INSTALLED.
- KEY NOTES:**
- OWNER FURNISHED AND INSTALLED.
 - CONNECT TO BUILDING MDF ROOM IN MAIN BUILDING SYSTEMS AS REQUIRED. SEE SITE PLAN FOR CONDUIT ROUTES AND REQUIREMENTS.
 - PROVIDE CAT-6 UTP CABLE TO INTERCOM SPEAKER LOCATIONS. ALL RUNS MUST BE HOME RUN TO IDF CLOSET.
 - PROVIDE 25-PAIR VOICE FEED CABLE FROM IDF RACK MOUNTED TERMINATION BLOCKS TO MDF ROOM. SEE SPECIFICATIONS FOR CABLE REQUIREMENTS.
 - PROVIDE BELDEN BIX TYPE TERMINATION BLOCKS FOR SYSTEMS AS REQUIRED.
 - EXTERIOR CAMERA LOCATIONS MAY BE FED WITH EITHER CATEGORY-6 UTP CABLE OF FIBER OPTIC CABLE. SEE SITE PLANS FOR REQUIREMENTS.



- GENERAL NOTE:**
- ALL FIBER OPTIC CABLE SHALL HAVE A MINIMUM 20 FOOT SERVICE LOOP NEATLY COILED ON WALL DIRECTLY BEHIND EQUIPMENT RACKS.

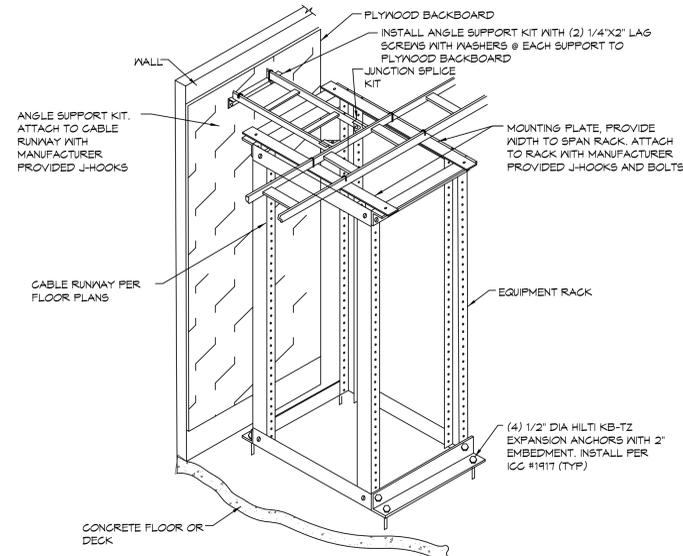
*** REFER TO (3) FOR ANCHORAGE DETAILS ***

COMMUNICATIONS/DATA NETWORKING RISER DIAGRAMS
NO SCALE

(1)
E4.2

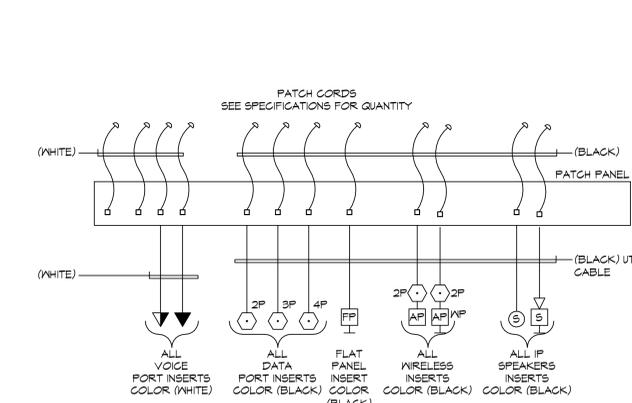
DATA DISTRIBUTION FRAME DETAIL
NO SCALE

(2)
E4.2



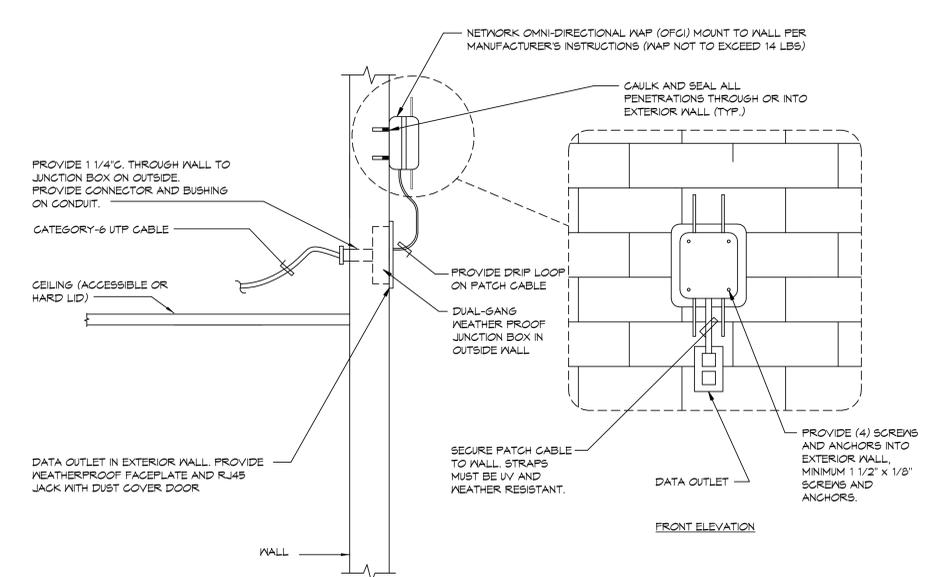
4 POST EQUIPMENT RACK ANCHORAGE
NO SCALE

(3)
E4.2



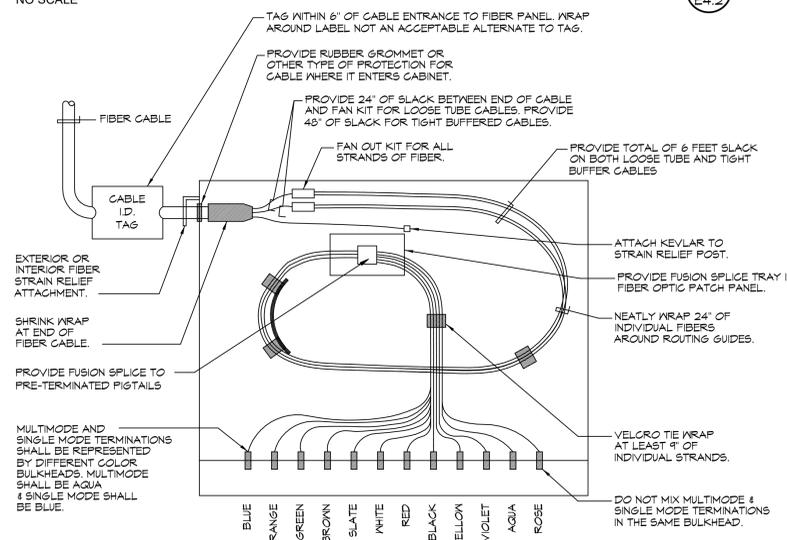
TYPICAL CABLE/INSERT COLOR SCHEME DETAIL
NO SCALE

(4)
E4.2



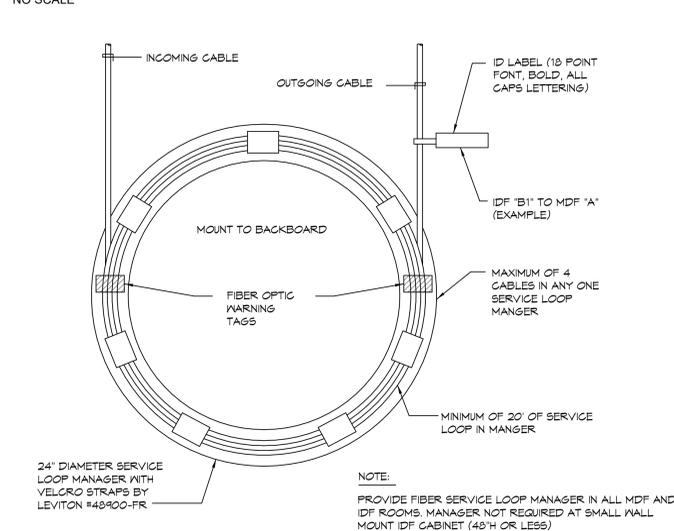
EXTERIOR WIRELESS ACCESS POINT MOUNTING DETAIL
NO SCALE

(5)
E4.2



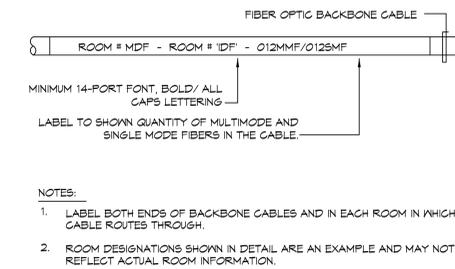
FIBER TERMINATION DETAIL
NO SCALE

(6)
E4.2



TYPICAL FIBER OPTIC FEED SERVICE LOOP DETAIL
NO SCALE

(7)
E4.2



TYPICAL BACKBONE LABELING DETAIL
NO SCALE

(8)
E4.2

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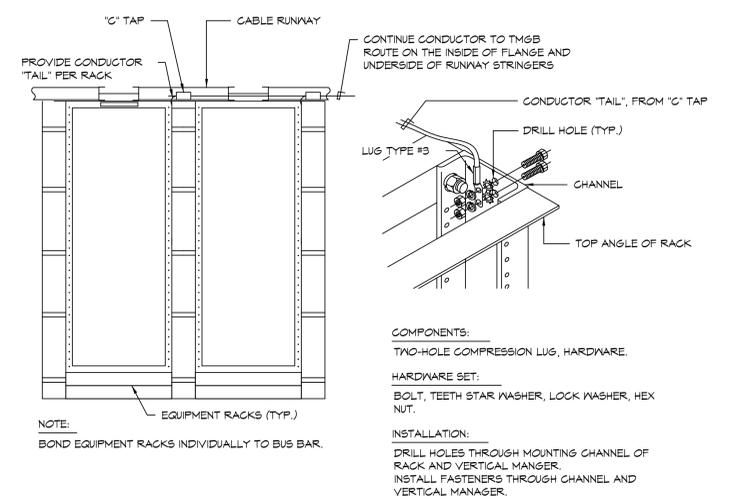
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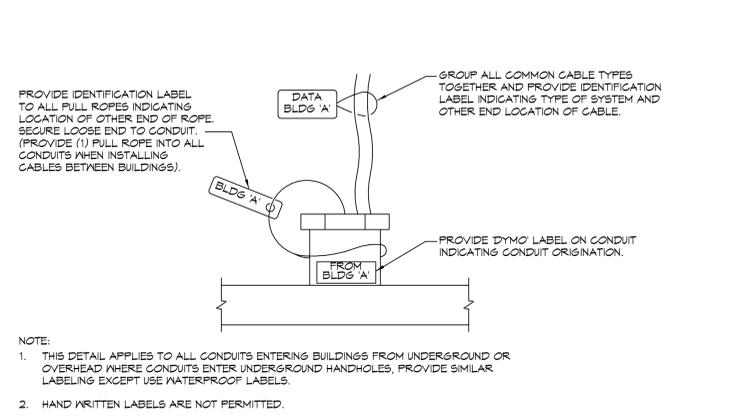
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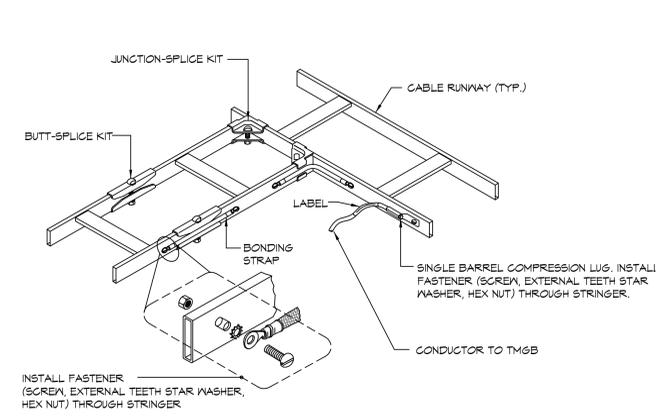
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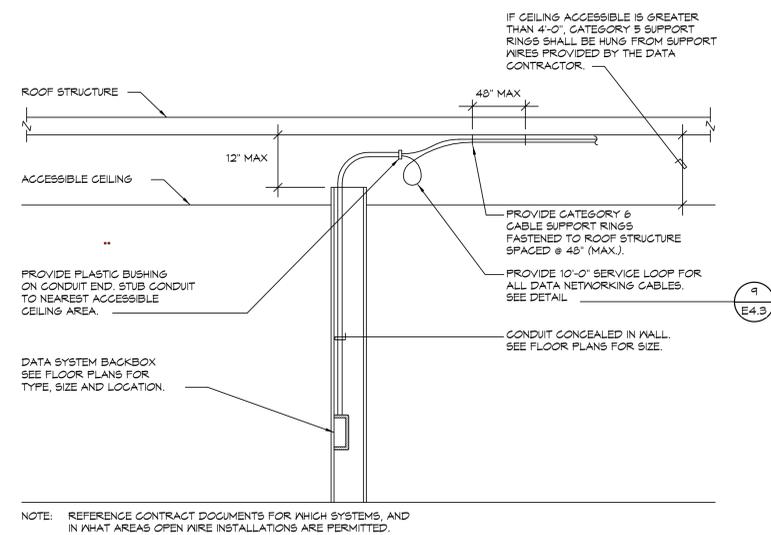
TYPICAL EQUIPMENT RACK BONDING IN MDF/IDF ROOM
 NO SCALE



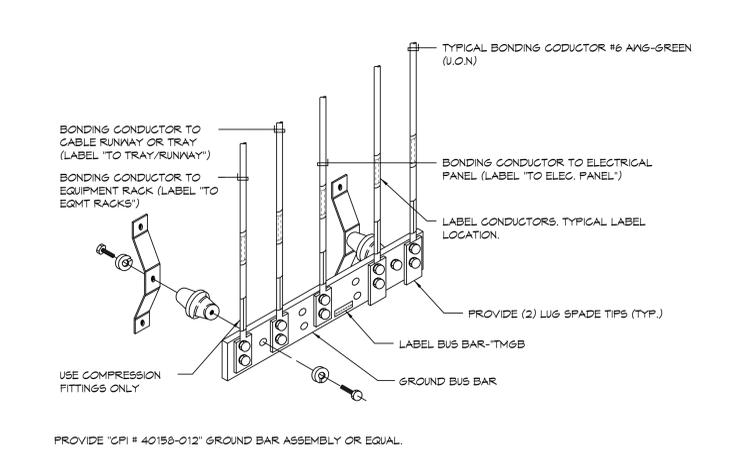
COMMUNICATION CABLE TYPICAL LABELING DETAIL
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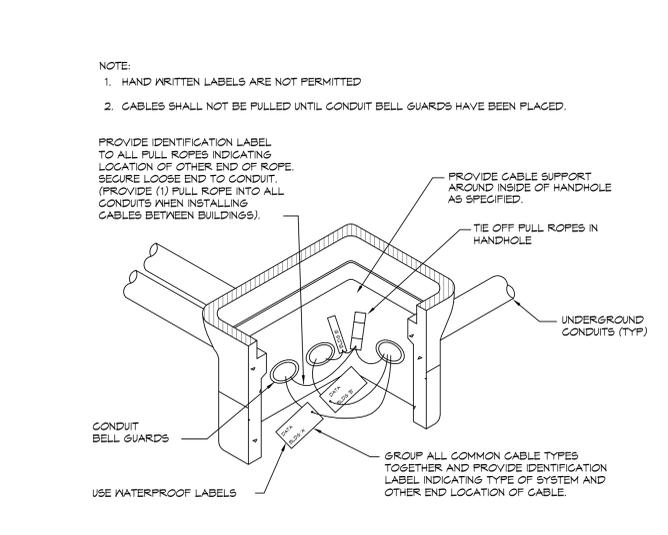
TYPICAL CABLE RUNWAY BONDING IN MDF/IDF ROOM
 NO SCALE



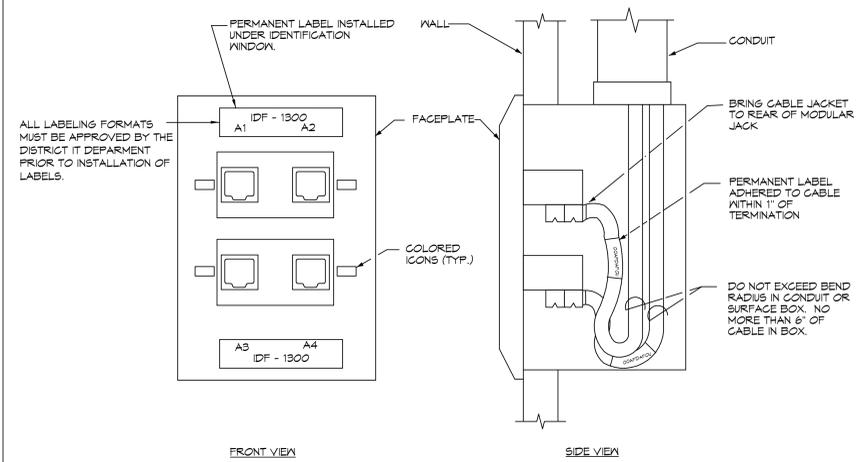
COMMUNICATIONS SYSTEM OPEN WIRE/CONDUIT STUB
 NO SCALE



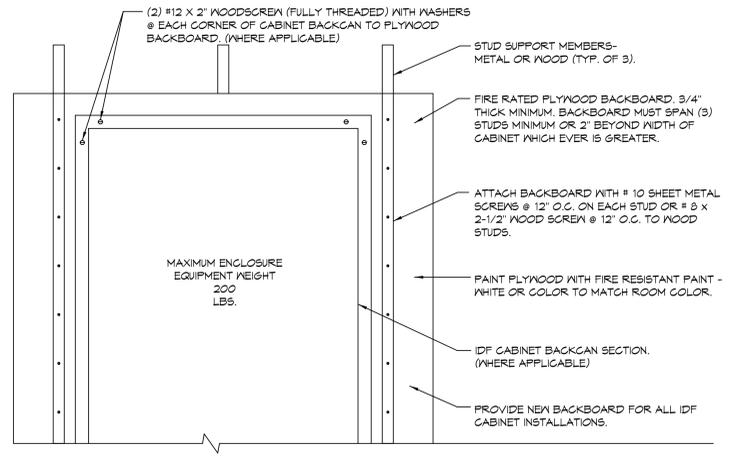
DATA/COMMUNICATIONS GROUNDING DETAIL
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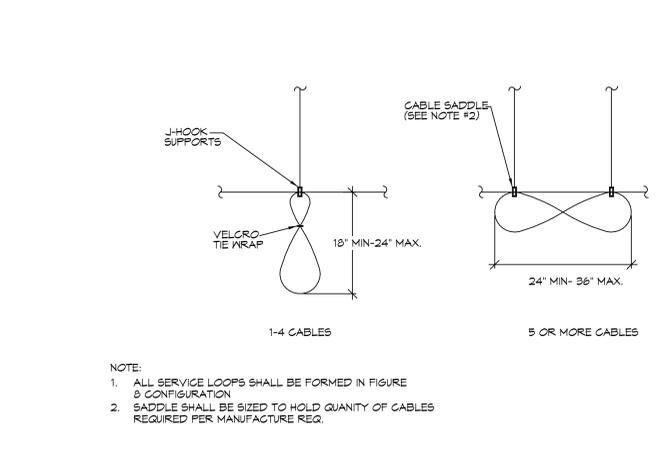
COMMUNICATION HANDHOLE LABELING DETAIL
 NO SCALE



TYPICAL FACEPLATE LABELING DETAIL
 NO SCALE



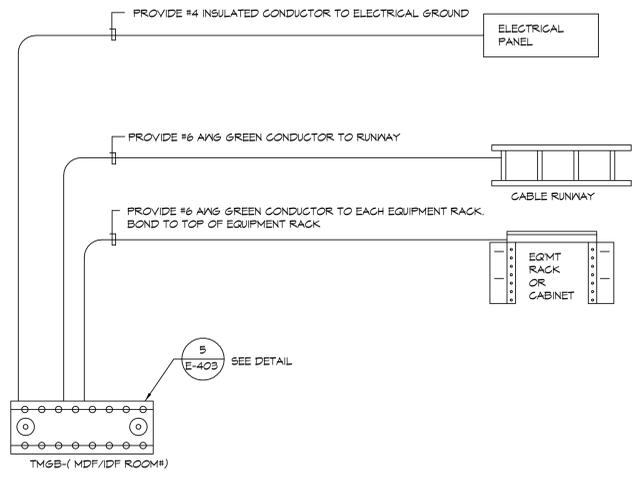
TYPICAL BACKBOARD DETAIL
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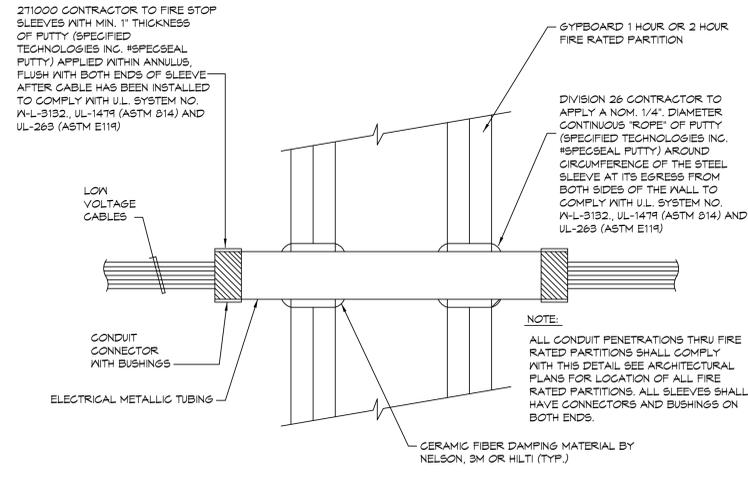
TYPICAL SERVICE LOOP
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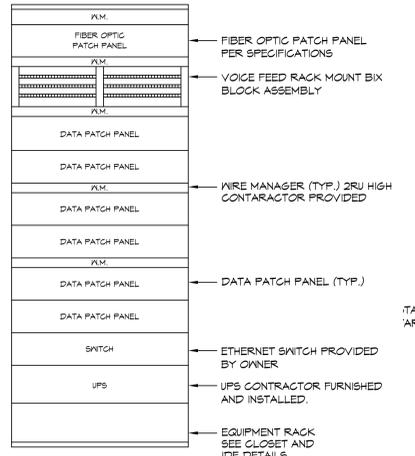
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TYPICAL MDF/IDF ROOM GROUNDING DETAIL 1 (E4.4)
NO SCALE



VOICE/DATA SLEEVE PENETRATION THRU FIRE RATED PARTITIONS 2 (E4.4)
NO SCALE



- GENERAL NOTE:
1. TERMINATE A MAXIMUM OF 192 CATEGORY 6 DATA CABLES IN ANY EQUIPMENT RACK.
 2. CONFIRM QUANTITY OF SWITCHES WITH DISTRICT FOR HORIZONTAL MANAGER REQUIREMENTS.
 3. EVEN DISTRIBUTE CABLES IN MULTIPLE RACKS.

MAXIMUM EQUIPMENT RACK POPULATION DETAIL 3 (E4.4)
NO SCALE

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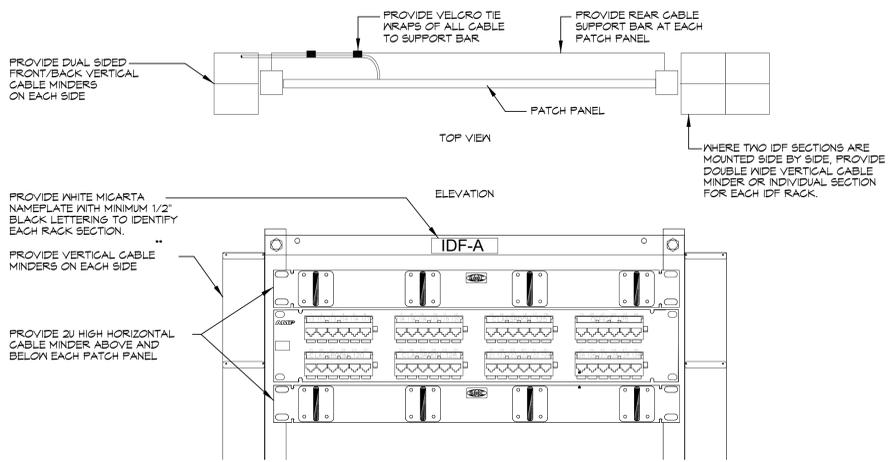
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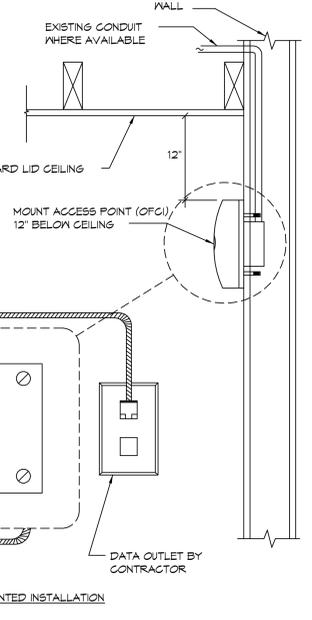
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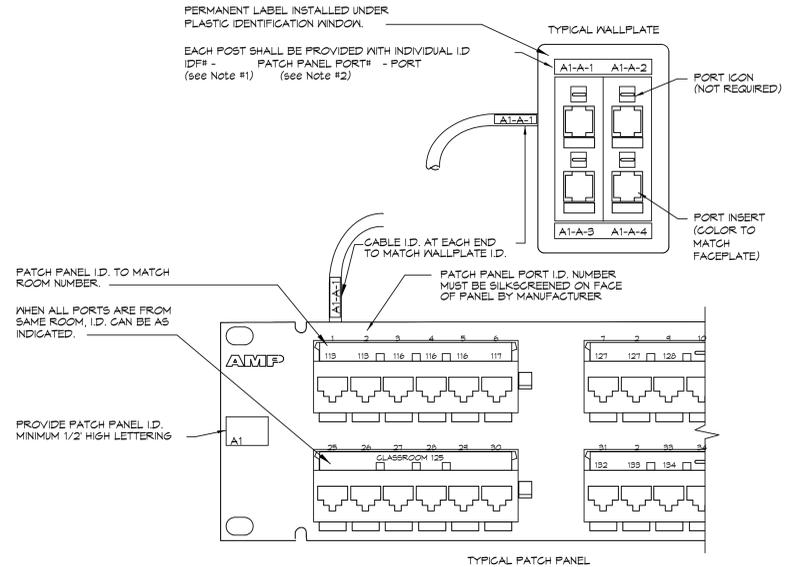


TYPICAL IDF/MDF LABELING AND CABLE SUPPORT DETAIL 4 (E4.4)
NO SCALE



WIRELESS ACCESS POINT ANTENNA MOUNTING DETAILS 6 (E4.4)
NO SCALE

- NOTE:
1. EACH IDF SHALL BE NUMBERED TO MATCH THE BUILDING NAME (IDF-A or IDF-100, FOR BUILDINGS WITH MULTIPLE IDFS (IDF-A1, A2 or IDF-100A, 100B)
 2. NUMBER TO MATCH MANUFACTURER'S PREPRINTED NUMBERS 1-40 ON PATCH PANEL
 3. BOTH ROOM NUMBER AND PATCH PANEL PORT ASSIGNMENT MUST BE SHOWN ON PATCH PANEL.
- GENERAL NOTES:
1. ALL IDENTIFICATIONS SHALL BE MACHINE MADE, NO HAND WRITTEN LABELS. SEE SPECIFICATIONS. VERIFY IN WRITING ALL ROOM IDENTIFICATIONS WITH ARCHITECT PRIOR TO MAKING ANY LABELS.
 2. ALL LABELING FORMATS ARE SUBJECT TO APPROVAL BY THE DISTRICT IT DEPARTMENT. CONTRACTOR MUST CONFIRM ALL LABELING FORMATS PRIOR TO INSTALLATION OF ANY LABELS AND MUST HAVE WRITTEN APPROVAL.



TYPICAL DATA NETWORKING LABELING REQUIREMENT 5 (E4.4)
NO SCALE

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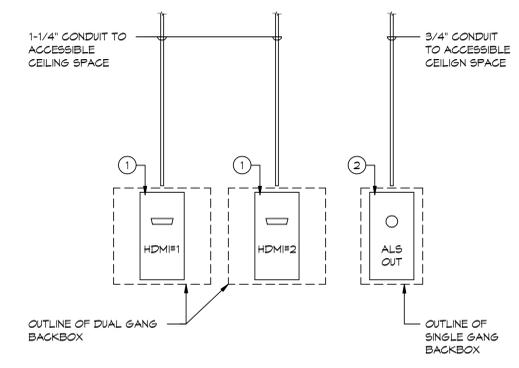
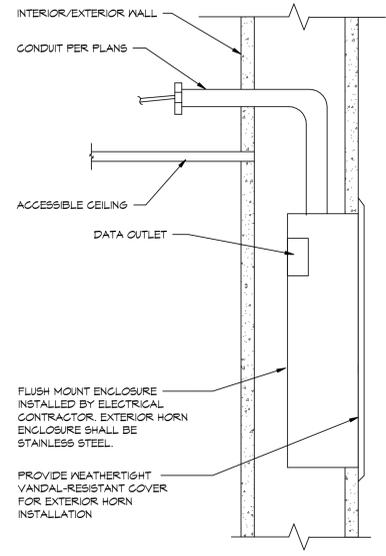
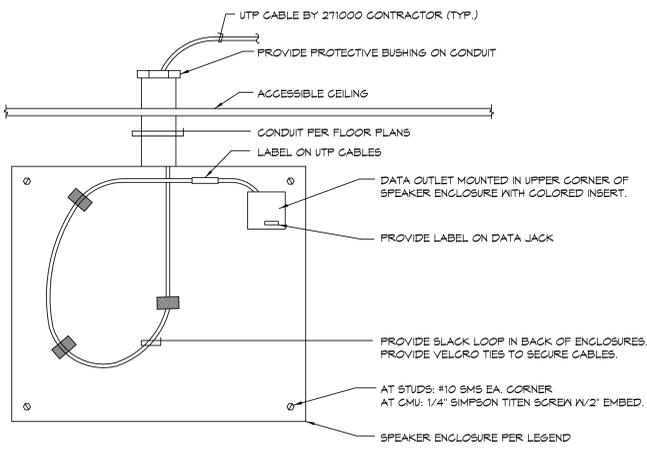
SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 12-29-2020



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 DIV. OF THE STATE ARCHITECT
 APP: 04-119771 INC.
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 SS FLS ACS
 DATE: 03/11/2021

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 CONSULTING ENGINEERS, INC.
 Power | Lighting | Multimedia
 Communications | Data Networking
 12875 Brookprinter Place, Suite 300
 Poway, CA 92064
 P 858.679.4030 | F 858.513.0559
 www.jce-inc.com

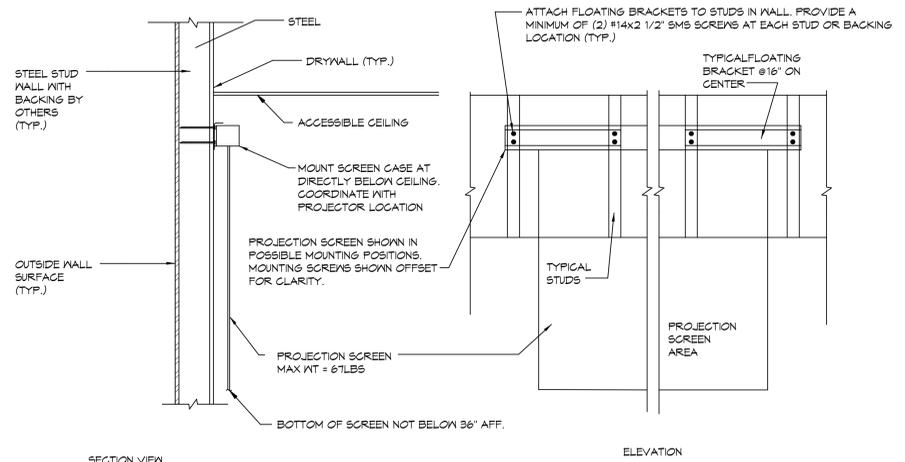
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- KEY NOTES:**
- ① SINGLE GANG PASS-THROUGH HDMI WALL PLATE
 - ② SINGLE GANG PASS-THROUGH WALL PLATE 3.5MM FOR ALS

FLUSH MOUNTED IP - BASED MASS NOTIFICATION SPEAKER/HORN
 NO SCALE 1
E4.5

TYPICAL 'LO' WALLPLATE DETAIL
 NO SCALE 2
E4.5



NOTE: CONTRACTOR TO FIELD VERIFY CONDITIONS AND CONSTRUCTION AT SITE PRIOR TO INSTALLATION OF SCREEN.

TYPICAL WALL MOUNTED PROJECTION SCREEN MOUNTING DETAIL
 NO SCALE 3
E4.5

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ISSUE No.	DATE	DESCRIPTION	

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3775 TENTH STREET, REVERDE CALIFORNIA 92083(951) 684-4664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92010(619) 438-5899

SCIENCE BLDG. MODERNIZATION

8756 MAST BOULEVARD, SANTEE, CA 92071
 GROSSMONT UNION HIGH SCHOOL DISTRICT

**COMMUNICATIONS
 DETAILS**

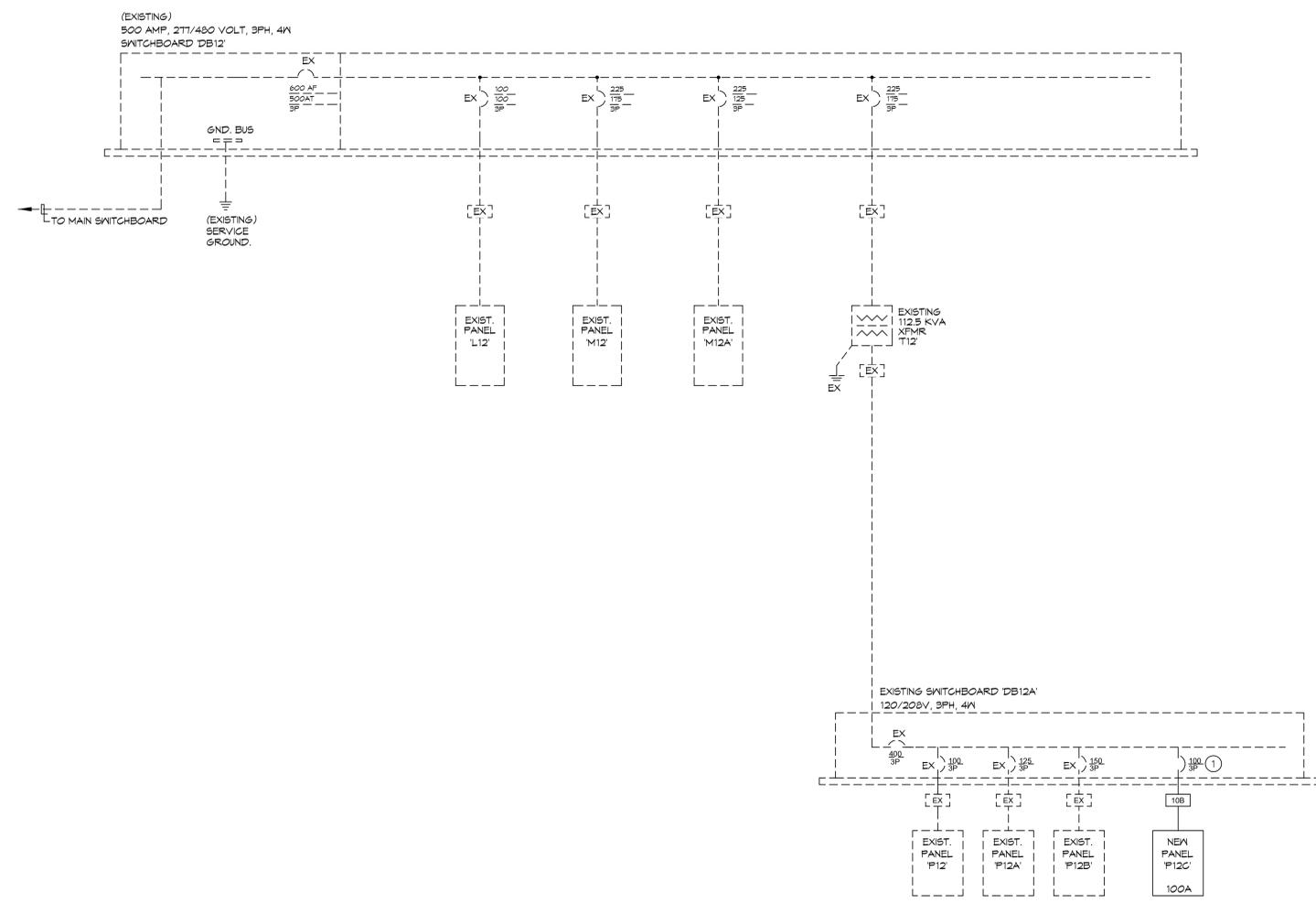
E4.5

Project Number

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 CONSULTANT BRANDING

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 ARCHITECTS



ELECTRICAL ONE-LINE DIAGRAM
NO SCALE

- KEY NOTES:**
- 1 PROVIDE NEW CIRCUIT BREAKER IN EXISTING SPACE

600V FEEDER SCHEDULE LEGEND

- MS REFERENCE MECHANICAL EQUIPMENT SCHEDULE FOR SIZE
- 2 | 60 INDICATES QUANTITY OF CONDUITS REQUIRED = (2)
- 4 | INDICATES SIZE OF CONDUITS REQUIRED = 4"
- 60 | INDICATES 'CONDUIT ONLY'

- 600V FEEDER SCHEDULE GENERAL NOTES:**
- ALL CONDUCTOR SHALL BE PROVIDED WITH TYPE THWN-2 INSULATION. REFERENCE SPECIFICATION SECTION 26 05 19 (16120) FOR ADDITIONAL REQUIREMENTS.
 - PROVIDE 60 DEGREE COPPER/ALUMINUM RATED TERMINATION FOR ALL FEEDERS SIZED WITH #2 OR SMALLER CONDUCTORS. PROVIDE 75 DEGREE COPPER/ALUMINUM RATED TERMINATIONS FOR ALL FEEDERS SIZED WITH #1 OR LARGER CONDUCTORS.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR ORDERING LUIS CONFIGURATION AN ALL EQUIPMENT, BREAKER OR DISCONNECTS TO MATCH FEEDER CONFIGURATIONS INDICATED.
 - WHERE MULTIPLE CONDUIT QUANTITIES ARE INDICATED, CONDUCTOR QUANTITIES AND SIZES SHOWN IN SCHEDULE SHALL BE PROVIDED IN EACH CONDUIT.

- GENERAL NOTES:**
- A FAULT CURRENT AND TIME CURRENT STUDY MUST BE PROVIDED AS DESCRIBED IN THE SPECIFICATIONS PRIOR TO FINAL APPROVAL OF THE POWER EQUIPMENT.
 - UNLESS WHERE OTHERWISE NOTED, ALL WORK INDICATED ON THESE DRAWINGS SHALL BE CONSIDERED NEW WORK.
 - ALL ELECTRICAL GEAR AND EQUIPMENT SHOWN ON ONE-LINE DIAGRAM SHALL BE NEMA 3R UNLESS OTHERWISE NOTED.

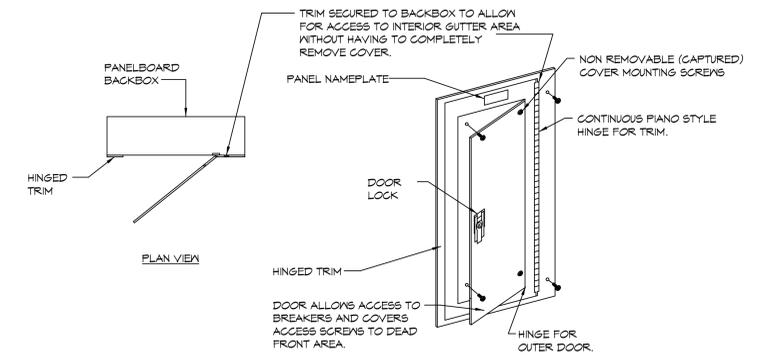
600Volt Feeder Schedule

I.D.	Type	Ampacity	Copper		Aluminum	
			Conduit	Conductors	Conduit	Conductors
2A		20	(1) 3/4"	3 # 12, 1# 12 Gnd	NA	NA
2B		20	(1) 3/4"	4 # 12, 1# 12 Gnd	NA	NA
3A		30	(1) 3/4"	3 # 10, 1# 10 Gnd	NA	NA
3B		30	(1) 3/4"	4 # 10, 1# 10 Gnd	NA	NA
4A		40	(1) 1"	3 # 8, 1# 10 Gnd	NA	NA
4B		40	(1) 1"	4 # 8, 1# 10 Gnd	NA	NA
5A		50	(1) 1"	3 # 6, 1# 10 Gnd	NA	NA
5B		50	(1) 1"	4 # 6, 1# 10 Gnd	NA	NA
6A		60	(1) 1 1/4"	3 # 4, 1# 8 Gnd	NA	NA
6B		60	(1) 1 1/4"	4 # 4, 1# 8 Gnd	NA	NA
7A		70	(1) 1 1/4"	3 # 4, 1# 8 Gnd	NA	NA
7B		70	(1) 1 1/4"	4 # 4, 1# 8 Gnd	NA	NA
8A		80	(1) 1 1/4"	3 # 3, 1# 8 Gnd	NA	NA
8B		80	(1) 1 1/4"	4 # 3, 1# 8 Gnd	NA	NA
9A		90	(1) 1 1/2"	3 # 2, 1# 8 Gnd	NA	NA
9B		90	(1) 1 1/2"	4 # 2, 1# 8 Gnd	NA	NA
10A		100	(1) 1 1/2"	3 # 1, 1# 8 Gnd	NA	NA
10B		100	(1) 1 1/2"	4 # 1, 1# 8 Gnd	NA	NA
12A		125	(1) 2"	3 # 1, 1# 6 Gnd	(1) 2"	3 # 20, 1# 3 Gnd
12B		125	(1) 2"	4 # 1, 1# 6 Gnd	(1) 2"	4 # 20, 1# 3 Gnd
15A		150	(1) 2"	3 # 10, 1# 6 Gnd	(1) 2"	3 # 30, 1# 3 Gnd
15B		150	(1) 2"	4 # 10, 1# 6 Gnd	(1) 2"	4 # 30, 1# 3 Gnd
17A		175	(1) 2"	3 # 20, 1# 6 Gnd	(1) 2"	3 # 30, 1# 3 Gnd
17B		175	(1) 2"	4 # 20, 1# 6 Gnd	(1) 2"	4 # 30, 1# 3 Gnd
20A		200	(1) 3"	3 # 30, 1# 4 Gnd	(1) 3"	3 # 30, 1# 2 Gnd
20B		200	(1) 3"	4 # 30, 1# 4 Gnd	(1) 3"	4 # 30, 1# 2 Gnd
22A		225	(1) 3"	3 # 40, 1# 4 Gnd	(1) 3"	3 # 30, 1# 2 Gnd
22B		225	(1) 3"	4 # 40, 1# 4 Gnd	(1) 3"	4 # 30, 1# 2 Gnd
25A		250	(1) 3"	3 # 250, 1# 4 Gnd	(1) 3"	3 # 350, 1# 2 Gnd
25B		250	(1) 3"	4 # 250, 1# 4 Gnd	(1) 3"	4 # 350, 1# 2 Gnd
30A		300	(1) 3"	3 # 350, 1# 4 Gnd	(1) 3"	3 # 500, 1# 2 Gnd
30B		300	(1) 3"	4 # 350, 1# 4 Gnd	(1) 3"	4 # 500, 1# 2 Gnd
35A		350	(2) 2"	3 # 20, 1# 2 Gnd	(2) 2"	3 # 30, 1# 1 Gnd
35B		350	(2) 2"	4 # 20, 1# 2 Gnd	(2) 2"	4 # 40, 1# 1 Gnd
40A		400	(2) 3"	3 # 30, 1# 2 Gnd	(2) 3"	3 # 30, 1# 10 Gnd
40B		400	(2) 3"	4 # 30, 1# 2 Gnd	(2) 3"	4 # 30, 1# 10 Gnd
45A		450	(2) 3"	3 # 40, 1# 2 Gnd	(2) 3"	3 # 30, 1# 10 Gnd
45B		450	(2) 3"	4 # 40, 1# 2 Gnd	(2) 3"	4 # 30, 1# 10 Gnd
50A		500	(2) 3"	3 # 250, 1# 2 Gnd	(2) 3"	3 # 350, 1# 10 Gnd
50B		500	(2) 3"	4 # 250, 1# 2 Gnd	(2) 3"	4 # 350, 1# 10 Gnd
60A		600	(2) 3"	3 # 350, 1# 1 Gnd	(2) 3"	3 # 500, 1# 20 Gnd
60B		600	(2) 3"	4 # 350, 1# 1 Gnd	(2) 3"	4 # 500, 1# 20 Gnd
70A		700	(3) 3"	3 # 40, 1# 10 Gnd	(3) 3"	3 # 300, 1# 30 Gnd
70B		700	(3) 3"	4 # 40, 1# 10 Gnd	(3) 3"	4 # 300, 1# 30 Gnd
80A		800	(3) 3"	3 # 300, 1# 10 Gnd	(3) 3"	3 # 500, 1# 30 Gnd
80B		800	(3) 3"	4 # 300, 1# 10 Gnd	(3) 3"	4 # 500, 1# 30 Gnd
100B		1000	(4) 3"	4 # 250, 1# 20 Gnd	(4) 3"	4 # 400, 1# 40 Gnd
120B		1200	(4) 4"	4 # 350, 1# 30 Gnd	(4) 4"	4 # 500, 1# 250 Gnd
160B		1600	(5) 4"	4 # 400, 1# 40 Gnd	(5) 4"	4 # 600, 1# 350 Gnd
200B		2000	(6) 4"	4 # 500, 1# 250 Gnd	(6) 4"	4 # 600, 1# 400 Gnd
250B		2500	(7) 4"	4 # 500, 1# 350 Gnd	(7) 4"	4 # 750, 1# 600 Gnd
300B		3000	(8) 4"	4 # 500, 1# 350 Gnd	(8) 4"	4 # 750, 1# 600 Gnd
350B		3500	(12) 4"	4 # 350, 1# 400 Gnd	(12) 4"	4 # 500, 1# 600 Gnd
400B		4000	(12) 4"	4 # 400, 1# 400 Gnd	(12) 4"	4 # 600, 1# 750 Gnd

NOT APPLICABLE

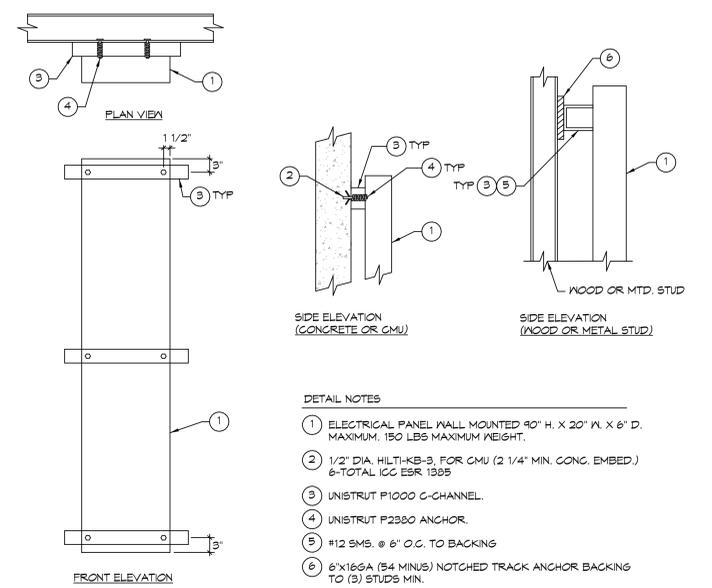
120/208 3PH, 4WIRE		100 AMP			Main Breaker X		ENCLOSURE TYPE		ENCLOSURE NOTE							
200% Neutral Bus (INTEGRAL)TVSS Protection		X			Lug		X		NEMA TYPE 1							
(REMOTE)TVSS Protection					Recessed				NEMA TYPE 3R							
Service Entrance Rated					Surface				NEMA TYPE 4X							
Load Side Feed (thru Lug)																
GENERAL DISTRIBUTION BREAKER REQUIREMENTS:					PROVIDE LOCK ON BREAKER DEVICES FOR ALL EMERGENCY LIGHTING, MOTORS, AND FIRE ALARM EQUIPMENT SERVED FROM THIS PANEL.											
LCL	NHL	CIRCUIT DESCRIPTION	AMP	POLE	NO	PHASE A	PHASE B	PHASE C	NO	AMP	POLE	CIRCUIT DESCRIPTION	LCL	NHL		
		DATA RACK RECEPT	20	1	1	1000			2	20	1	RECEPTACLES				
		DATA RACK RECEPT	20	1	3	400			4	20	1	RECEPTACLES				
		DATA RACK RECEPT	20	1	5			1000	6	20	1	SPARE				
		DATA RACK RECEPT	20	1	7	1000			8	20	1	SPARE				
		208V RACK RECEPT	30	2	9			2000	10	20	1	SPARE				
		"	-	-	11			2000	12	20	1	SPARE				
		SPARE	20	1	13				14	20	1	SPARE				
		SPARE	20	1	15				16	20	1	SPARE				
		SPARE	20	1	17				18	20	1	SPARE				
		SPARE	20	1	19				20	20	1	SPARE				
		SPARE	20	1	21				22	20	1	SPARE				
		SPARE	20	1	23				24	20	1	SPARE				
		SPARE	20	1	25				26	20	1	SPARE				
		SPARE	20	1	27				28	20	1	SPARE				
		SPARE	20	1	29				30	20	1	SPARE				
		SPACE	20	1	31				32	20	1	SPACE				
		SPACE	20	1	33				34	20	1	SPACE				
		SPACE	20	1	35				36	20	1	SPACE				
		SPACE	20	1	37				38	20	1	SPACE				
		SPACE	20	1	39				40	20	1	SPACE				
		SPACE	20	1	41				42	20	1	SPACE				
SPECIAL PANEL NOTE					NOTE #1		NOTE #2									
NHL = Non Harmonic Load					TOTAL LOAD PER PHASE		2400	3400	3000	HIGH PHASE		3400	/ 0.9pf = VA @ 120V	31.5	AMPS	
LCL = Long Continuous Load					25% LONG CONTINUOUS LOADS		0	0	0	ALL PHASES		8800	/ 0.9pf = VA @ 208V/3PH	27.2	AMPS	
SUB PANEL					SUB PANEL				DEMAND PER						AMPS	
Max. Neut. Load					TOTAL CONNECTED LOAD		2400	3400	3000	CEC 220-96						AMPS

M:\Panel Schedule\2020\20081 West Hills Science\IP12C.xls 1:35 PM 12/18/2020

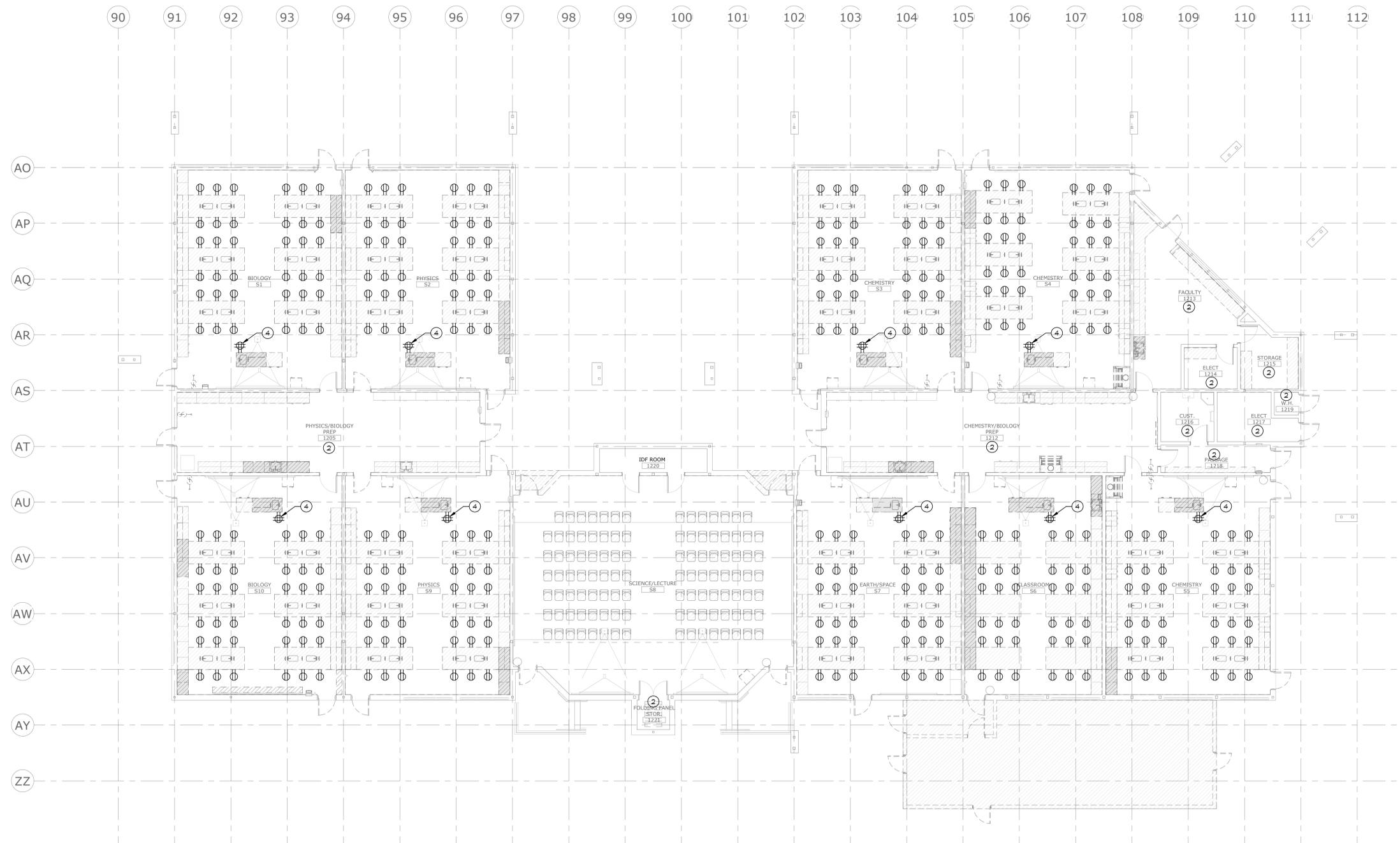


DETAIL GENERAL NOTES
 1. PROVIDE FOR ALL PANELBOARDS FOR THIS PROJECT - SURFACE, RECESSED NEMA 1, OR NEMA 3R CONFIGURATION.
 2. SEE REFERENCE ONE LINE DIAGRAM FOR ALL PANELBOARD AIC RATINGS.

TYPICAL PANELBOARD DOOR/TRIM DETAIL 1 EQ.1 NO SCALE



SURFACE WALL MOUNTED ELECTRICAL PANEL DETAIL 2 EQ.1 NO SCALE



DEMOLITION GENERAL NOTES:

- ALL ITEMS SHOWN ON THIS DRAWING ARE EXISTING TO BE REMOVED UNLESS OTHERWISE NOTED. SEE REQUIREMENTS BELOW FOR SCOPE OF WORK. ALL OTHER ELECTRICAL ITEMS IN THIS BUILDING ARE EXISTING TO REMAIN. MAINTAIN POWER CIRCUIT CONTINUITY UNTIL NEW SOURCE IS ENERGIZED AND READY FOR TRANSFER. REFER TO POWER AND LIGHTING PLANS.
- ALL ELECTRICAL DEMOLITION WORK SHALL BE DIRECTED BY THE ELECTRICAL CONTRACTOR.

GENERAL DEMOLITION REQUIREMENTS:

- LIGHTING FIXTURES**
WHERE EXISTING LIGHTING FIXTURES ARE TO BE REMOVED, AND ARE NOT RELOCATED, CONTRACTOR SHALL DISPOSE OF ALL FIXTURES INCLUDING LAMPS AND BALLAST.
- WIRING DEVICES**
WHERE EXISTING SWITCHES OR RECEPTACLES ARE TO BE REMOVED, THE CONTRACTOR SHALL DISPOSE OF ALL DEVICES AS REQUIRED.
- COMMUNICATION DEVICES**
WHERE EXISTING TELEPHONE/INTERCOM AND CLOCK HEAD END EQUIPMENT, PHONES, SPEAKERS AND OTHER ASSOCIATED EQUIPMENT ARE TO BE REMOVED, THE CONTRACTOR SHALL DISPOSE OF ALL DEVICES AND EQUIPMENT AS REQUIRED.
- FIRE ALARM**
WHERE EXISTING FIRE ALARM PANELS AND ASSOCIATED SMOKE, HEAT, DUCT DETECTORS, PULL STATIONS AND STROBE OR HORN UNITS ARE TO BE REMOVED, THE CONTRACTOR SHALL DISPOSE OF ALL DEVICES AND EQUIPMENT AS REQUIRED.
- INTRUSION ALARM**
EXISTING INTRUSION ALARM SENSORS AND EQUIPMENT SHALL BE REMOVED WHERE INDICATED. RETURN ALL DEVICES TO THE SCHOOL DISTRICT MAINTENANCE FACILITIES.
- POWER EQUIPMENT**
WHERE EXISTING SWITCHBOARDS, PANELBOARDS, LOAD CENTERS, TRANSFORMERS, DISCONNECT SWITCHES OR OTHER DISTRIBUTION EQUIPMENT ARE TO BE REMOVED, THE CONTRACTOR SHALL DISPOSE OF ALL DEVICES AND EQUIPMENT AS REQUIRED.
- ALL BOXES, EXPOSED CONDUIT, WIRE, AND OTHER ITEMS ASSOCIATED WITH ELECTRICAL EQUIPMENT TO BE REMOVED, SHALL BE DISCONNECTED, REMOVED AND DISPOSED OF BY THE CONTRACTOR AS REQUIRED, UNLESS SPECIFICALLY NOTED OTHERWISE. CUT AND CAP CONCEALED CONDUITS. PATCH, SEAL, AND REPAIR SURFACE TO MATCH ADJACENT AREA WHERE BOXES ARE REMOVED.

KEY NOTES:

- EXISTING ELECTRICAL DEVICE OR EQUIPMENT IN ROOM TO REMAIN.
- ALL DEVICES AND EQUIPMENT IN THIS ROOM ARE EXISTING TO REMAIN.
- ALL DEVICES AND EQUIPMENT THIS WALL ARE EXISTING TO REMAIN.
- EQUIPMENT OR DEVICE TO BE REMOVED, PROTECTED AND RE-INSTALLED AT CONCLUSION OF WORK.

LEVEL 1 FLOOR PLAN - DEMOLITION SCALE: 1/8" = 1'-0" 1

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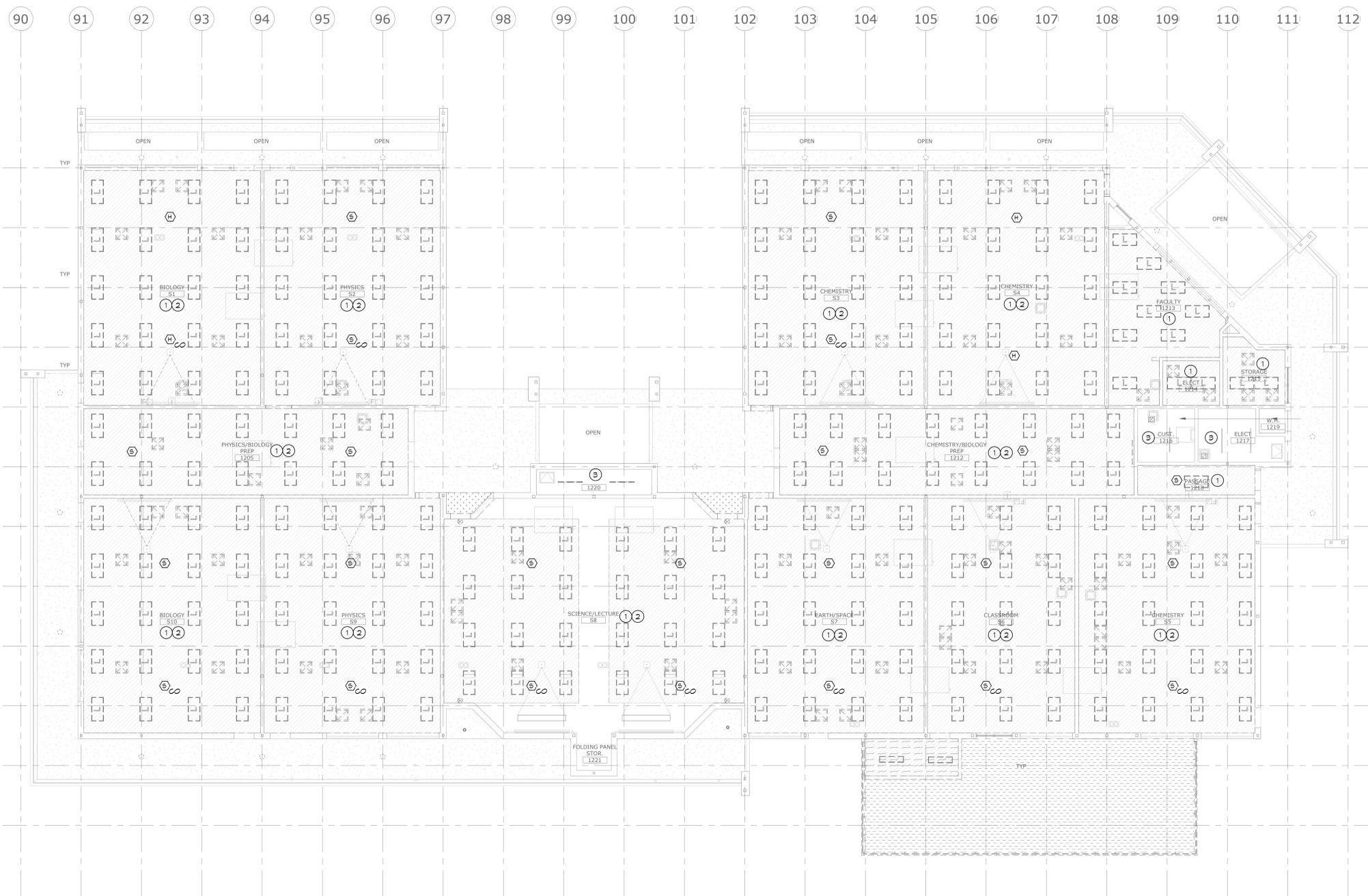


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- DEMOLITION GENERAL NOTES:**
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- KEY NOTES:**
- ALL EXISTING LIGHTING FIXTURES TO BE DISCONNECTED, REMOVED AND RETROFITTED FOR LED. FIXTURES SHALL BE RE-INSTALLED IN NEW DROP CEILING AND RECONNECTED TO EXISTING CIRCUIT. EXISTING LIGHTING CONTROLS DEVICES SHALL BE DEMOLISHED AND REPLACED WITH NEW LIGHTING CONTROLS DEVICES SHALL PROVIDED TO MEET CURRENT TITLE 24 REQUIREMENTS.
 - CEILING MOUNTED FIRE ALARM DEVICES SHALL BE REMOVED AND REINSTALLED IN THE NEW DROP CEILING. ALL OTHER FIRE ALARM DEVICES TO REMAIN AS CONNECTED.
 - EXISTING LIGHTING FIXTURES AND CONTROLS TO BE DEMOLISHED AND REPLACED WITH NEW.

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LEVEL 1 FLOOR PLAN - DEMOLITION FIRE ALARM 1

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SCIENCE BLDG. MODERNIZATION

REFLECTED CEILING
 PLAN - DEMOLITION

E10.2

SCIENCE BLDG. MODERNIZATION: DSA SUBMITTAL - CD SET - 12-29-2020

DSA Approved WHHS Specifications



PROJECT MANUAL

SCIENCE BUILDING MODERNIZATION –
WEST HILLS HIGH SCHOOL

GROSSMONT UNION HIGH SCHOOL DISTRICT

SANTEE, CA

CONSTRUCTION DOCUMENTS

VOLUME 1 OF 1 Divisions 00 - 32

DSA Application #04-119771

File #37-H4

1.30.50

February 2021

**SECTION 00 01 01
PROJECT TITLE PAGE**

FOR

SCIENCE BUILDING MODERNIZATION

PROJECT NUMBER: 1-30-50

DISTRICT

**GROSSMONT UNION HIGH SCHOOL DISTRICT
1100 MURRAY DRIVE, EL CAJON, CALIFORNIA 92020
WWW.GUHSD.NET**

PROJECT LOCATION

**WEST HILLS HIGH SCHOOL
8756 MAST BOULEVARD
SANTEE , CALIFORNIA 92071**

PREPARED BY:

ARCHITECT

RUHNAU CLARKE ARCHITECTS

5751 Palmer Way, Suite C, Carlsbad, California 92010
760.438.5899
www.ruhnaucclarke.com

NOTICE: This Project Manual, is an unpublished instrument of service of the authors. It is prepared for use only on this Project and in conjunction with the authors' interpretations, observations, decisions and administration, as described in the Conditions of the Contract. Desired results without these services cannot be assured. Use in whole or in part, without the authors' services and expressed written consent may violate Act 17 U.S.C. par. 301 (1991).

SECTION 00 01 02
PROJECT INFORMATION

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

- A. Project Name: Science Building Modernization, located at:
Project Number: 1-30-50.
West Hills High School.
8756 Mast Boulevard.
Santee, California 92071.
- B. The Owner, hereinafter referred to as District: Grossmont Union High School District
Grossmont Union High School District
1100 Murray Drive, El Cajon, California 92020
www.guhsd.net
619.644.8145

1.02 NOTICE TO PROSPECTIVE BIDDERS

- A. These documents constitute an Invitation to Bid to and request for qualifications from General Contractors for the construction of the project described below.

1.03 PROJECT DESCRIPTION

- A. Summary Project Description: Interior remodel of an existing science classroom building.
B. Contract Scope: Construction, demolition, and renovation.
C. Contract Terms: Lump sum (fixed price, stipulated sum).

1.04 PROJECT CONSULTANTS

- A. The Architect, hereinafter referred to as Architect: **Ruhnau Clarke Architects**
5751 Palmer Way, Suite C, Carlsbad, California 92010
www.ruhnauclarke.com
760.438.5899

1.05 PROCUREMENT TIMETABLE

- A. Last Request for Substitution Due: 14 days prior to due date of bids.
B. Last Request for Information Due: 14 days prior to due date of bids.
C. Bid Opening: Same day, 3 PM local time.
D. Bids May Not Be Withdrawn Until: 30 days after due date.
E. Contract Time: To be stated in bid documents.
F. The District reserves the right to change the schedule or terminate the entire procurement process at any time.

1.06 PROCUREMENT DOCUMENTS

A. Availability of Documents: Complete sets of procurement documents may be obtained:

1. From District at the Project Manager's address listed above.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

APP: 04-119771 INC:

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DATE: 03/11/2021

**SECTION 00 01 07
SEALS PAGE**

ARCHITECT OF RECORD (AOR)

RUHNAU CLARKE ARCHITECTS

5751 Palmer Way, Suite C, Carlsbad, California 92010

David Ruhнау, Architect of Record C-20662



STRUCTURAL ENGINEER OF RECORD (SEOR)

KNA CONSULTING ENGINEERS, INC.

9931 Muirlands Blvd., Irvine, CA 92618

Larry Kaprielian S-2795



MECHANICAL ENGINEER OF RECORD (MEOR)

MA ENGINEERS

5160 Carroll Canyon Road, Suite 200, San Diego CA 92121

Roy C. Campbell M-025911



ELECTRICAL ENGINEER OF RECORD (EOR)

JOHNSON CONSULTING ENGINEERS, INC.

12875 Brookprinter Place, #300, Poway CA 92064

Monica Goese-Hansen E-14781



END OF SEALS PAGE

SECTION 00 01 08
DEFERRED APPROVALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This project contains a deferred approval item filed as a separate review from the overall site and building project per DSA requirements. The general scope is scope shown on the Drawings. The requirements for this scope are contained in the following disciplines:
 - 1. Seismic Restraint for Suspended Distribution Systems: OSHPD Pre-Approved systems for overhead utilities; Fire Sprinklers, Plumbing, HVAC, Electrical, and Communications.
 - a. OPM-0043-13 - Seismic Restraint Guidelines for Suspended Distribution Systems as provided by Mason West, Inc..
 - b. OPM-0052-13 - Seismic Restraint Systems Guidelines as provided by Eaton's B-Line Business.
 - c. OPM-062-13 - Seismic Sway Bracing for Fire Sprinkler Systems as provided by ERICO International Corporation.
 - d. OPM-0203-13 - Seismic Restraint Guidelines for Suspended Distribution Systems and Equipment as provided by M.W. Sausse & Co. Inc..
 - e. OPM-0294-13 - Seismic Bracing Solutions as provided by Power-Strut, a part of Atkore International.
 - f. OPM-0295-13 - Seismic Bracing Solutions as provided by UNISTRUT, a part of Atkore International.
 - g. OPM-0351-13 - Seismic Sway Bracing for Fire Protection Systems as provided by Anvil International.
 - h. Note: These system submittals and applications are to be reviewed and approved by the design professional prior to review and approval by the DSA Field Engineer.
- B. Deferred Approval Items

1.02 PERFORMANCE REQUIREMENTS

- A. For each of the above items, the Contractor, subcontractor or supplier shall provide specifications, specific details, drawings, descriptive materials, shop drawings and structural calculations.
 - 1. All deferred submittals must be received at DSA no later than 60 days after letting contract.
- B. Structural calculations shall be signed by an engineer registered in California.
- C. Installation of the above listed items of work shall not be started until detail plans, specifications and engineering calculations have been approved by the Division of the State Architect.
 - 1. Upon receipt of the above material by the Architect, it will be reviewed in detail by the Architect and Consulting Engineers of Record for this project.
 - 2. If acceptable, the Architect and Consulting Engineers of Record will sign an approval form and the Contractor shall submit to the Division of the State Architect for approval.

3. Contractor shall furnish all additional calculations required if the Division of the State Architect requests such additional information at no cost to District.
 4. Contractor shall provide full size color, electronic format PDF copies of the agency approved documents to the Architect and District.
- D. Contractor shall schedule and give prompt attention to the preparation and submittal of these deferred approval items.
1. Extension of contract time will not be given if project is delayed due to not making submittals in a timely manner.

END OF SECTION

SECTION 00 01 10
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**SECTION 00 40 25
REQUEST FOR INFORMATION**

RFI NUMBER: _____

DATE: _____

PROJECT NAME: SCIENCE BUILDING MODERNIZATION

PROJECT NO.: 1-30-50

TO: RUHNAU CLARKE ARCHITECTS

5751 Palmer Way, Suite C, Carlsbad, California 92010

Attention: _____

Contractor: _____

Address: _____

Request By: _____ Date: _____

BRIEF SUMMARY OF RFI: _____

Drawing No. _____ Detail No. _____

Specification Section _____ Title _____

Page _____ Paragraph _____

DETAILS OF THIS RFI: _____

Attachments: _____

RESPONSE WILL BE INCLUDED IN AN ADDENDUM

END OF RFI

SECTION 00 43 25
SUBSTITUTION REQUEST FORM - DURING PROCUREMENT

SUBSTITUTION REQUEST NO. _____

DATE: _____

PROJECT NAME: **SCIENCE BUILDING MODERNIZATION**

PROJECT NUMBER: **1-30-50**

TO: **RUHNAU CLARKE ARCHITECTS**

5751 Palmer Way, Suite C, Carlsbad, California 92010

From: _____

We hereby submit for your consideration the following product comparisons of the specified product and the proposed substitution. The undersigned fully understands that failure to answer any item below may be cause for rejection of request for substitution.

Request for substitution shall only be made during bidding (not later than 7 days prior to bid opening for inclusion by Addendum) except under conditions beyond control of Contractor.

SPECIFIED PRODUCT: _____

Project Manual Section Title _____ Number ___ Page ____ Paragraph ____.

Drawing No. _____ Detail No. _____

Proposed Substitution: _____

Manufacturer: _____ Tel: _____

A. Is the point-by-point comparative data attached? — REQUIRED BY A/E

B. Reason request for substitution is being submitted: _____

DIFFERENCES BETWEEN PROPOSED SUBSTITUTION AND SPECIFIED PRODUCT

A. Does proposed substitution affect in any way the Structural Safety, Access Compliance, or Fire & Life Safety portions of the project? No__ Yes__

Explain _____

B. Does proposed substitution affect dimensions, gages, weights, etc. on Drawing? No__ Yes__

Explain _____

SECTION 00 63 25
SUBSTITUTION REQUEST FORM - DURING CONSTRUCTION

SUBSTITUTION REQUEST NO. _____

DATE: _____

PROJECT NAME: SCIENCE BUILDING MODERNIZATION

PROJECT NUMBER: 1-30-50

TO: RUHNAU CLARKE ARCHITECTS

5751 Palmer Way, Suite C, Carlsbad, California 92010

From: _____

We hereby submit for your consideration the following product comparisons of the specified product and the proposed substitution. The undersigned fully understands that failure to answer any item below may be cause for rejection of request for substitution.

This request for substitution form shall only be used after the end of the bidding period except under conditions beyond control of Contractor.

Specified Product: _____

Project Manual Section Title _____ Number ___ Page ___ Paragraph ___.

Drawing No. _____ Detail No. _____

Proposed Substitution: _____

Manufacturer: _____ Tel: _____

A. Reason request for substitution is being submitted: _____

B. Does proposed substitution affect in any way the Structural Safety, Access Compliance, or Fire & Life Safety portions of the project? No__ Yes__

Explain _____

C. Does proposed substitution affect dimensions, gages, weights, etc. on Drawing? No__ Yes__

Explain _____

D. Does proposed substitution require changes in Drawings or design and installation changes? No__ Yes__

(If yes, cost of Architect and Engineer document changes are the responsibility of the Contractor.)

- E. Does proposed substitution affect product cost, delivery time, or construction schedule?
 No ___ Yes ___ Explain _____
- F. Does proposed substitution comply with specified ICC Number, UL Rating, ASTM Numbers?
 No ___ Yes ___ Explain _____
- G. Does proposed substitution affect other trades and systems such as wiring, piping, ductwork, structure, etc.? No ___ Yes ___ (Explain which and how) _____

If yes, has impact on their work been included in price of proposed substitution? No ___ Yes ___.

- H. Does proposed substitution product guarantee differ from that of the specified product?
 No ___ Yes ___ Explain _____

If the substitution request is accepted, it will result in:

No cost impact ___ Improve Schedule ___ Credit of \$ _____

Attach a listing of 3 projects (one in service for at least 3 years) using the proposed substitution.

Substantiating Data: Attach product data/brochures and Vendor qualifications for both specified and substitute product. Provide samples for both specified and substitute products, if applicable.

Certification: Undersigned has examined Construction Documents, is familiar with specified product, understands indicated application of product, and understands design intent of the Architect caused by the requested substitution.

Submitted by: _____
 (Type Name) Signature Date

Signature must be made by person having legal authority to bind his firm to the above terms.

Architect's Comments:

___ Accepted, ___ accepted as noted, ___ not accepted, ___ received too late.

Reviewed by:

 Architect Date

 Construction Manager Date

 District Date

END OF SECTION

SECTION 01 10 00
SUMMARY

PART 1 GENERAL

1.01 PROJECT

- A. Project Name: Science Building Modernization
- B. District's Name: Grossmont Union High School District.
- C. Architect's Name: Ruhnau Clarke Architects.
- D. The Project consists of the construction of _____ located at West Hills High School.

1.02 CONTRACT DESCRIPTION

- A. Contract Type: A single prime contract based on a Stipulated Price as described in Owner-Contractor Agreement.
- B. The Work: The Work is construction and related services for a , CBC, Occupancy Type Educational Group E, Construction Type V-B, , totaling approximately 15728 square feet.
 - 1. The Work includes new building construction, interior improvements, building utilities, and related site improvements; with patch and repair as required, and other features to the extent indicated on the Drawings.

1.03 CONTRACT DOCUMENTS

- A. Contract Requirements:
 - 1. Conditions of the Contract and other Contract documents have been included in the Project Manual, as indicated in the Table of Contents.
 - a. Such documents are not Specifications.
 - 2. Specifications are found in Divisions 01 through 33 of the Project Manual.
- B. Contract Drawings: The Drawings provided with and identified in the Project Manual are the Drawings referenced in the Agreement.
 - 1. The location, extent and configuration of the required construction and improvements are shown and noted on Drawings.
 - a. The Drawings are referenced in the Agreement.
 - b. An index of Drawings is included in the set of Drawings.
 - 2. Drawings are arranged into series according to design discipline. Such organization and all references to trades, subcontractor, specialty contractor or supplier shall not control the Contractor in dividing the Work among subcontractors or in establishing the extent of the Work to be performed by any trade.
 - 3. Where the terms "as shown", "as indicated", "as noted", "as detailed", "as scheduled", or terms of like meaning, are used in the Drawings or Specifications, it shall be understood that reference is being made to the Drawings referenced in the Agreement.
 - 4. Where reference to the word "plans" is made anywhere in Drawings, Specifications and related Contract Documents, it shall be understood to mean the Drawings referenced in the Agreement.

- C. Contract Specifications: The Specifications provided in the Project Manual are the Specifications referenced in the Agreement.
 - 1. Specifications are organized by Divisions and Sections in accordance with the recommended practices of the Construction Specifications Institute.
 - a. Such organization shall not control the Contractor in dividing the Work among subcontractors or in establishing the extent of Work to be performed by any trade.
 - 2. Specifications are included in the Project Manual, which may also include other Bidding and Contract Documents.
 - a. Contents of the Project Manual are listed in Document 00 01 10 - Table of Contents, in the Project Manual.

1.04 DESCRIPTION OF ALTERATIONS WORK

- A. Scope of demolition and removal work is indicated on drawings and specified in Section 02 41 00.
 - 1. The intent of these drawings and specifications are the work of the alteration, rehabilitation, or reconstruction of this facility shall be submitted and approved by DSA before proceeding with the repair work. CAC Section 4-317.
- B. Scope of alterations work is indicated on drawings.
- C. Plumbing: Alter existing system and add new construction, keeping existing in operation.
- D. HVAC: Alter existing system and add new construction, keeping existing in operation.
- E. Electrical Power and Lighting: Alter existing system and add new construction, keeping existing in operation.
- F. Fire Suppression Sprinklers: Alter existing system and add new construction, keeping existing in operation.
- G. Fire Alarm: Alter existing system and add new construction, keeping existing in operation.
- H. Telephone: Alter existing system and add new construction, keeping existing in operation.
- I. Security System: Alter existing system and add new construction, keeping existing in operation.
- J. Communications: Alter existing system and add new construction, keeping existing in operation.

1.05 WORK BY OWNER

- A. Concurrent Work Under Separate Contracts:
 - 1. Work Under Separate Contracts: District will award separate contracts for products and installation for interior improvements and other work as may be indicated on Drawings as NIC (Not in Contract).
 - 2. Relationship to Work Under the Contract:
 - a. Work under the Contract shall include all provisions necessary to make such concurrent work under separate contracts complete in every respect and fully functional, including field finishing.

- b. Provide necessary backing, supports, piping, conduit, conductors and other such provisions from point of service to point of connection, as shown on Drawings and specified herein.
 - 3. Related Contract Documents:
 - a. District will make available, in a timely manner, drawings and specifications of work under separate contracts for coordination and further description of that work.
 - b. Such drawings and other data required for the coordination of the work of separate contracts with the Work of this Contract may be included with the Contract Documents.
 - c. If so, they are provided for convenience only and are not to be considered Contract Documents produced by Architect or Architect's consultants.
 - 4. Permits, Notices and Fees:
 - a. Permits, Notices and Fees: Notices required by and approvals required of authorities having jurisdiction for work under separate contracts and related fees will be solely the responsibility of District.
- B. Items noted NIC (Not in Contract) will be supplied and installed by District before Substantial Completion. Some items include:
 - 1. Movable cabinets.
 - 2. Furnishings.
 - 3. Small equipment.
 - 4. Rugs.
 - 5. Artwork.
- C. District will supply the following for installation by Contractor:
 - 1. Owner-Furnished Products: District may furnish, for installation by Contractor, products which are identified on the Drawings and in the Specifications as OFCI (Owner-Furnished/Contractor-Installed).
 - 2. Relationship to Work Under the Contract:
 - a. Work under the Contract shall include all provisions necessary to fully incorporate such products into the Work, including, as necessary.
 - 1) Fasteners.
 - 2) Backing,.
 - 3) Supports.
 - 4) Piping.
 - 5) Conduit.
 - 6) Conductors.
 - 7) Other such provisions from point of service to point of connection.
 - 8) Field finishing, as shown on Drawings and specified herein.
 - b. See Section 01 30 00 - Administrative Requirements for additional requirements.

1.06 PERMITS, LICENSES AND FEES

- A. Permits:

1. For Work included in the Contract, Contractor shall obtain all permits from authorities having jurisdiction and from serving utility companies and agencies.
 2. District will reimburse Contractor for amount charged for such permits, without mark-up.
 3. For Work performed under design/build basis, plan check and permit fees shall be included in the Contract Sum.
- B. Licenses:
1. Contractor shall obtain and pay all licenses associated with construction activities, such as business licenses, contractors' licenses and vehicle and equipment licenses.
 2. All costs for licenses shall be included in the Contract Sum.
- C. Assessments:
1. District will pay all assessments and utility service connection fees. Costs of assessments shall not be included in the Contract Sum.
- D. Test and Inspection Fees:
1. Contractor shall pay all fees charged by authorities having jurisdiction and from serving utility companies and agencies, for tests and inspections conducted by those authorities, companies and agencies.
 2. District will reimburse Contractor for actual amount of such fees, without mark-up.
 3. Refer to Section 01 40 00 - Quality Requirements for additional information on tests and inspections and responsibility for payment of fees.

1.07 OWNER OCCUPANCY

- A. District intends to continue to occupy adjacent portions of the existing site during the entire construction period.
- B. District intends to occupy the Project upon Substantial Completion.
- C. Cooperate with District to minimize conflict and to facilitate District's operations.
- D. Schedule the Work to accommodate District occupancy.

1.08 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
- B. Arrange use of site and premises to allow:
 1. District occupancy.
 2. Work by Others.
 3. Work by District.
 4. Use of site and premises by the public.
- C. Provide access to and from site as required by law and by District:
 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 2. Site Access:

- a. Limit access to site to indicated routes and access points as indicated.
 - b. If routes and access points are not indicated, access shall be as approved by District.
 - c. Do not restrict access to adjacent properties and do not restrict access for those performing work under separate contracts for the District.
3. Do not obstruct roadways, sidewalks, or other public ways without permit.
4. Construction Limit:
- a. Limit construction activities to areas indicated on Drawings as Project Area or, if not indicated, to areas within the parcel as described in the legal description on the Drawings.
 - b. Refer also to Section 01 50 00 - Temporary Construction Facilities and Controls for additional requirements.
- D. Existing building spaces may not be used for storage.
- E. Time Restrictions:
- 1. Limit conduct of especially noisy, malodorous, and dusty exterior work to the hours of 8 AM to 6 PM.
 - 2. Limit conduct of especially noisy interior work to the hours of 9 AM to 4 PM.
- F. Utility Outages and Shutdown:
- 1. Limit disruption of utility services to hours the site is unoccupied.
 - 2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to District and authorities having jurisdiction.
 - 3. Prevent accidental disruption of utility services to other facilities.

1.09 CONSTRUCTION WASTE MANAGEMENT

- A. Construction and waste management, complying with Section 01 74 19 - Construction Waste Management and Disposal, is a requirement for this project.
- B. The Contractor, Prime Contractors, and subcontractors all have obligations in meeting the requirements of this specification.

END OF SECTION

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

- A. Section 01 78 00 - Closeout Submittals: Project record documents.

1.03 SCHEDULE OF VALUES

- A. Use Schedule of Values Form:
 - 1. Form provided by District.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Submit Schedule of Values in duplicate within 15 days after date established in Notice to Proceed.
- E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization.
- F. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- G. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.
- H. Revise schedule to list approved Change Orders, with each Application For Payment.
 - 1. List each authorized Change Order as an extension on the continuation sheet, listing the Change Order number and dollar value as for an original portion of Work.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
 - 1. Substantiating information will normally be required only for those portions of Work whose completion state cannot be readily determined by observation of the completed Work.
- B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.

- C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- D. Forms filled out by hand will not be accepted.
- E. For each item, provide a column for listing each of the following:
 - 1. Item Number.
 - 2. Description of work.
 - 3. Scheduled Values.
 - 4. Previous Applications.
 - 5. Work in Place and Stored Materials under this Application.
 - 6. Authorized Change Orders.
 - 7. Total Completed and Stored to Date of Application.
 - 8. Balance to Finish.
 - 9. Retainage.
- F. Execute certification by signature of authorized officer.
- G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
 - 1. No Change Orders shall be included with Application for Payment until approved in writing by District and Architect. Also approved by DSA when appropriate.
- I. Submit one electronic and three hard-copies of each Application for Payment.
- J. Include the following with the application:
 - 1. Transmittal letter as specified for submittals in Section 01 30 00.
 - 2. Construction progress schedule, revised and current as specified in Section 01 30 00.
 - 3. Current construction photographs specified in Section 01 30 00.
 - 4. Partial release of liens from major subcontractors and vendors.
 - a. Provide with each Application for Payment lien releases from all subcontractors, workers and materials suppliers employed for the Project covering their portion of Work to date for which payment application is made. Lien release forms will be provided by District and shall be completed in accordance with directions provided.
 - 5. Project record documents as specified in Section 01 78 00, for review by District which will be returned to the Contractor.
 - 6. Affidavits attesting to off-site stored products.
- K. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 ADDENDA

- A. Addenda are changes issued prior to the signing of the Contract for Construction. These Addenda shall be signed by the Architect and approved by the Division of the State Architect.

- B. These documents may or may not have approved by the Division of the State Architect prior to the close of Bid.
 - 1. If not approved by DSA prior to close of the bidding period, the contract price shall include the Addenda.
 - 2. No work shall proceed regarding any Addendum until approved by DSA.
 - 3. Revisions to Addenda, when approved by DSA, shall be incorporated by an additional addendum or Change Order as indicated below and as provided for in the Contract for Construction and General Conditions.

1.06 MODIFICATION PROCEDURES

- A. Construction Changes, General:
 - 1. The following describe administrative procedures to be followed in compliance with provisions of the Conditions of the Contract for Architect's Supplemental Instructions, Construction Change Directives, Construction Change Documents, and Contract Change Orders.
 - 2. The Architect will prepare and issue: Architect's Supplemental Instructions, a Construction Change Directive or a Request for Proposal to be presented to the Contractor for action.
- B. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to Contract Documents.
- C. Contract Change Order Forms: Form as directed by District.
- D. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.
 - 1. Architect's Supplemental Instructions:
 - a. Minor changes in the Work, not involving an adjustment in either the Contract Sum or Contract Time, as authorized by the Conditions of the Contract, will be presented by the Architect using the Architect's Bulletin form.
 - b. Should the Architect's Supplemental Instructions result in disputed costs and time adjustments, such dispute shall be resolved in accordance with the provisions of the Conditions of the Contract.
- E. DSA Construction Change Document approval for substitutions and changes to structural, accessibility, or fire-life-safety portions of approved Drawings and Specifications is required from DSA prior to fabrication and installation. DSA IR A-6; CAC Section 4-215, & 4-233(c).
 - 1. The approved Construction Change Document shall be signed by:
 - a. Architect of Record.
 - b. When applicable:
 - 1) Structural Engineer of Record.
 - 2) Mechanical Engineer of Record.
 - 3) Electrical Engineer of Record.
 - 4) Civil Engineer of Record.
 - 5) Delegated Professional Engineer.
 - c. Division of the State Architect for final approval.

- F. For other required changes, not involving structural, accessibility, or fire-life-safety portions of approved Drawings and Specifications, Architect will issue a document signed by District instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 2. Promptly execute the change.
 3. Construction Change Directives: In accordance with provisions of the Conditions of the Contract, the District may direct the Contractor to proceed with a change in the Work prior to formal preparation, review and agreement of a Contract Change Order, in order to not delay construction.
 - a. The Architect will prepare and issue a change document containing a Construction Change Directive which, when signed by the District and the Architect, shall instruct the Contractor to proceed with a change in the Work, for subsequent inclusion in a Contract Change Order.
 - b. Should the Construction Change Directive result in disputed costs and time adjustments, such dispute shall be resolved in accordance with the provisions of the Conditions of the Contract.
 - c. Construction Change Directives shall follow procedures specified below for Contract Change Orders except that Contractor shall immediately proceed with the change upon receipt of the signed Change Directive.
- G. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 14 days.
1. Such Request for Proposal may include an estimate of additions or deductions in Contract Time and Contract Sum for executing the change and may include stipulations regarding overtime work and the period of time the requested response from the Contractor shall be considered valid.
- H. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on work by separate or other contractors. Document any requested substitutions in accordance with Section 01 60 00.
1. After review of the request and with the District's approval, the Architect will prepare a change document containing a Request for Proposal, as described above.
 2. Issuance of such a request by the Architect shall not indicate authorization of the Contractor to proceed with the proposed change.
 3. Changes will be approved only by an approved Construction Change Directive and Contract Change Order.
- I. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
 2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
 3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
 4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.
- J. Substantiation of Costs: Provide full information required for evaluation.
1. On request, provide the following data:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
 2. Support each claim for additional costs with additional information:
 - a. Origin and date of claim.
 - b. Dates and times work was performed, and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
 3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
 - a. Cost and Time Resolution: If amounts for changes in Contract Sum and Contract Time cannot be agreed upon by District and Contractor, amounts shall be resolved in accordance with provisions of the Conditions of the Contract for resolution of disputes and the following:
 - 1) Contractor shall keep accurate records of time, both labor and calendar days, and cost of materials and equipment.
 - 2) Contractor shall prepare and submit an itemized account and supporting data after completion of changed Work, within the time limits indicated in the Conditions of the Contract.
 - 3) Contractor shall provide full information as required and requested, for District and Architect to evaluate and substantiate proposed costs and time for the change in the Work.
 - 4) When District and Contractor determine mutually acceptable amounts for changes in Contract Sum and Contract Time, a Contract Change Order shall be executed for these amounts.
 - 5) District shall have the right to audit Contractor's invoices and bid quotations to substantiate costs for Contract Change Orders.

- K. Construction Changes Based on Stipulated Sum or Time: Based on the Contractor's response to a Request for Proposal or Construction Change Directive, the District and Architect will review the response.
 - 1. The District and Contractor shall negotiate a mutually acceptable adjustment in Contract Sum and Contract Time, as appropriate, prior to performance of the changed Work.
 - 2. A Contract Change Order for the stipulated amounts shall be prepared based on the stipulated sum and change in time.
- L. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
 - 1. When agreement is reached on changes, if any, in the Contract Time and the Contract Sum, the Contractor shall prepare a Contract Change Order using a form as directed by the District, with supplementary documents as necessary to describe the change and the associated costs and schedule impacts.
 - 2. Construction Change Document approval is required from DSA prior to fabrication and installation.
 - 3. Submit Contract Change Orders to District through the Architect.
 - 4. Contractor shall prepare and submit five original sets of documents for each Change Order. District, Architect and Construction Manager shall sign the Change Order indicating acceptance and approval of the change.
 - a. Structural Engineer shall also sign the Change Order, when applicable.
 - 5. All Change Orders must be approved by DSA prior to fabrication and installation.
 - 6. Upon approval of the Change Order, Contractor shall promptly execute the change in the Work.
- M. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- N. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
 - 1. Contractor shall submit revised schedules at the next Application for Payment following approval and acceptance of the Contract Change Order.
- O. Promptly enter changes in Project Record Documents.

1.07 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
 - 1. All closeout procedures specified in Section 01 70 00.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

- A. Division 00 - Procurement and Contracting Requirements: Restrictions on timing of substitution requests.
- B. Section 00 43 25 - Substitution Request Form - During Procurement: Required form for substitution requests made prior to award of contract (During procurement).
- C. Section 00 63 25 - Substitution Request Form - During Construction: Required form for substitution requests made after award of contract (During construction).
- D. Section 01 30 00 - Administrative Requirements: Submittal procedures, coordination.
- E. Section 01 60 00 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.
- F. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Restrictions on emissions of indoor substitute products.

1.03 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
 - 1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - a. Unavailability.
 - b. Regulatory changes.
 - 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
 - a. Substitution requests offering advantages solely to the Contractor will not be considered.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Requests by Contractor to deviate from specified requirements for products, materials, equipment, and methods, or to provide products other than those specified, shall be considered requests for substitutions except under the following conditions:
 - 1. Substitutions are requested during the bidding period, and accepted prior to execution of the Contract. Acceptance shall be in the form of written Addendum to the Bidding

documents or revision to the Drawings or Specifications for use as Construction Contract Documents.

2. Changes in products, materials, equipment, and methods of construction are directed by the District or Architect.
 3. Contractor options for provision of products and construction methods are specifically stated in the Contract Documents.
 4. Change in products, materials, equipment, and methods of construction is required for compliance with Codes, ordinances, regulations, orders and standards of authorities having jurisdiction.
- B. Substitution Provisions: Refer to substitution provisions of the Conditions of the Contract, in addition to the requirements specified herein. Provisions for consideration and acceptance of substitutions shall be as follows:
1. Documentation:
 - a. Substitutions will not be considered if they are indicated or implied on shop drawing, product data or sample submittals.
 - b. All requests for substitution shall be made by separate written request from Contractor.
 2. Cost and Time Considerations: Substitutions will not be considered unless a net reduction in Contract Sum or Contract Time results to the District's benefit, including redesign costs, life cycle costs, changes in related Work and overall performance of building systems.
 3. Design Revision:
 - a. Substitutions will not be considered if acceptance will require substantial revision of the Contract Documents or will substantially change the intent of the design, in the opinion of the Architect.
 - b. The intent of the design shall include functional performance and aesthetic qualities.
 4. Data: It shall be the responsibility of the Contractor to provide adequate data demonstrating the merits of the proposed substitution, including cost data and information regarding changes in related Work.
 5. Determination by Architect:
 - a. Architect will determine the acceptability of proposed substitutions and will notify Contractor, in writing within a reasonable time, of acceptance or rejection.
 - b. The determination by the Architect regarding functional performance and aesthetic quality shall be final.
 6. Non-Acceptance: If a proposed substitution is not accepted, provide the specified product.
 - a. If, in the opinion of the Architect, the substitution request is incomplete or has insufficient data to enable a full and thorough review of the intended substitution, the substitution may be summarily refused and determined to be unacceptable.
 7. Substitution Limitation: Only one request for substitution will be considered for each product.

- C. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - a. Include a signed certification that the Contractor has:
 - 1) Reviewed the proposed substitution and has determined that the substitution is equivalent or superior in every respect to product requirements indicated or product specified in the Contract Documents.
 - 2) Certify the proposed substitution is suited for and can perform the purpose or application of the specified product indicated or specified in the Contract Documents.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to District.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.
 - a. Include a signed waiver by the Contractor for changes in the Contract Time or Contract Sum because of the following:
 - 1) Substitution failed to perform adequately.
 - 2) Substitution required changes in on other elements of the Work.
 - 3) Substitution caused problems in interfacing with other elements of the Work.
 - 4) Substitution was determined to be unacceptable by authorities having jurisdiction.
 - 6. Agrees to reimburse District and Architect for review or redesign services associated with re-approval by authorities.
- D. A Substitution Request for specified installer constitutes a representation that the submitter:
 - 1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.
- E. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
 - 1. Note explicitly any non-compliant characteristics.
- F. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. Forms indicated and included in the Project Manual are adequate for this purpose, and must be used.
 - 2. No specific form is required. Contractor's Substitution Request documentation must include the following:
 - a. Project Information:
 - 1) Official project name and number, and any additional required identifiers established in Contract Documents.
 - 2) District's, Architect's, and Contractor's names.

- b. Substitution Request Information:
 - 1) Discrete and consecutive Substitution Request number, and descriptive subject/title.
 - 2) Indication of whether the substitution is for cause or convenience.
 - 3) Issue date.
 - 4) Reference to particular Contract Document(s) specification section number, title, and article/paragraph(s).
 - 5) Description of Substitution.
 - 6) Reason why the specified item cannot be provided.
 - 7) Differences between proposed substitution and specified item.
 - 8) Description of how proposed substitution affects other parts of work.
 - c. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item:
 - 1) Physical characteristics.
 - 2) In-service performance.
 - 3) Expected durability.
 - 4) Visual effect.
 - 5) Sustainable design features.
 - 6) Warranties.
 - 7) Other salient features and requirements.
 - 8) Include, as appropriate or requested, the following types of documentation:
 - (a) Product Data:
 - (b) Samples.
 - (c) Certificates, test, reports or similar qualification data.
 - (d) Drawings, when required to show impact on adjacent construction elements.
 - 9) Include a detailed description, in written or graphic form as appropriate, indicating all changes or modifications needed to other elements of the Work and to construction to be performed by the District and by others under separate Contract with District, that will be necessary if the proposed substitution is accepted.
 - d. Impact of Substitution:
 - 1) Savings to District for accepting substitution.
 - (a) Include detailed cost data, including a proposal for the net change, if any, in the Contract Sum.
 - 2) Change to Contract Time due to accepting substitution.
 - (a) Indicate the substitution's effect on the Construction Schedule. Indicate the effect of the proposed substitution on overall Contract Time and, as applicable, on completion of portions of the Work for use by District or for work under separate contract by District.
- G. Limit each request to a single proposed substitution item.
- 1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

- A. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period, and the documents required.
- B. Pursuant to Section 3400 of the Public Contract Code, requests for substitution will be considered only if received up to 7 days prior to the bid date. Subsequent requests will be considered only in the case of product unavailability, through no fault of the Contractor , or for reasons of cost reducing value analysis requested by the District .
- C. Submittal Form (before award of contract):
 - 1. Submit substitution requests by completing the form in Section 00 43 25; see this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Submittal Form (after award of contract):
 - 1. Submit substitution requests by completing the form in Section 00 63 25; see this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- B. After Contract award, requests will be considered for cause only; in the case of product unavailability, through no fault of the Contractor , or for reasons of cost reducing value analysis requested by the District.
 - 1. Substitutions will be considered when a product, through no fault of the Contractor, becomes unavailable or unsuitable due to regulatory change.
 - 2. Product Availability Waiver:
 - a. Substitutions will be considered after 35 day time limit only when a product becomes unavailable due to no fault of Contractor.
 - b. Failure to place orders for specified products sufficiently in advance of required date for incorporation into the Work will not be considered as a valid reason for which Contractor may request a substitution or deviation from requirements of the Drawings and Specifications.
 - 3. Waiver: At the discretion of the District, limitations on substitutions may be waived.
- C. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
- D. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
 - 1. In addition to meeting general documentation requirements, document how the requested substitution benefits the District through cost savings, time savings, greater energy conservation, or in other specific ways.
 - 2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
 - 3. Bear the costs engendered by proposed substitution of:

- a. District's compensation to the Architect for any required redesign, time spent processing and evaluating the request.
 - b. Other construction by District.
 - c. Other unanticipated project considerations.
- E. Substitutions will not be considered under one or more of the following circumstances:
- 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 - 2. Without a separate written request.
 - 3. When acceptance will require revisions to Contract Documents.

3.04 CONTRACT DOCUMENT REVISIONS:

- A. Should a Contractor-proposed substitution or alternative sequence or method of construction require revision of the Contract Drawings or Specifications;
 - 1. Including revisions for the purposes of determining feasibility, scope or cost, or revisions for the purpose of obtaining review and approval by authorities having jurisdiction.
 - 2. Revisions will be made by Architect or other consultant of District who is the responsible design professional, as approved in advance by District.
- B. Services of Architect or other consultant of the District, including time spent in researching and reporting on proposed substitutions or alternative sequence and method of construction, shall be paid by Contractor when such activities are considered additional services to the design services contracts of the Architect or other responsible design professional with the District.
- C. Costs of services by Architect or other responsible design professional of the District shall be paid on a time and materials basis, based on current hourly fee schedules, with reproduction, long distance telephone and shipping costs reimbursable at cost plus usual and customary mark-up for handling and billing.
- D. Such fees shall be paid whether or not the proposed substitution or alternative sequence or method of construction is ultimately accepted by District and a Change Order is executed.
- E. Such fees shall be paid from Contractor's portion of savings, if a net reduction in Contract Sum results. If fees exceed Contractor's portion of net reduction, Contractor shall pay all remaining fees unless otherwise agreed in advance by the District.
- F. Such fees owed shall be deducted from the amount owed Contractor on the Application for Payment next made following completion of revised Contract Drawings and Specifications or completion of research and other services. District will then pay Architect or other consultant of the District.
- G. Certain substitutions require approval from DSA.

3.05 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify Contractor in writing of decision to accept or reject request.
 - 1. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.06 ACCEPTANCE

- A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.07 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

3.08 ATTACHMENTS

- A. A facsimile of the Substitution Request Form (During Construction) required to be used on the Project is included after this section.

END OF SECTION

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General administrative requirements.
- B. Electronic document submittal service.
- C. Preconstruction meeting.
- D. Site mobilization meeting.
- E. Progress meetings.
- F. Construction progress schedule.
- G. Contractor's daily reports.
- H. Progress photographs.
- I. Coordination drawings.
- J. Submittals for review, information, and project closeout.
- K. Number of copies of submittals.
- L. Requests for Interpretation or Information (RFI) procedures.
- M. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Section 01 32 16 - Construction Progress Schedule: Form, content, and administration of schedules.
- B. Section 01 60 00 - Product Requirements: General product requirements.
- C. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.
- D. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.
- E. Technical Product Sections: Procedures for specific submittals specified in those Sections to be made at Contract closeout.

1.03 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires responsive action by Construction Manager and Architect or other responsible design professional.
- B. Informational Submittals: Written information that does not require responsive action by Construction Manager and Architect or other responsible design professional.
- C. Unsolicited Submittals: Action or informational submittals not required by the Contract Documents or not requested by the reviewer. Unsolicited submittals may be returned with notation "not reviewed."

- D. Product Data: Standard published information ("catalog cuts") and specially prepared data for the Work of the Contract, including standard illustrations, schedules, brochures, diagrams, performance charts, instructions and other information to illustrate a portion of the Work.
- E. Request for Interpretation or Information (RFI): A document submitted by the Contractor requesting clarification of a portion of the Contract Documents, hereinafter referred to as an RFI.
- F. Samples: Physical examples that demonstrate the materials, finishes, features, workmanship and other characteristics of a portion of the Work. Accepted samples shall serve as quality basis for evaluating the Work.
- G. Shop Drawings, Product Data and Samples: Instruments prepared and submitted by Contractor, for Contractor's benefit, to communicate to Architect the Contractor's understanding of the design intent, for review and comment by Architect on the conformance of the submitted information to the general intent of the design. Shop drawings, product data and samples are not Contract Documents.
- H. Shop Drawings: Drawings, diagrams, schedules and illustrations, with related notes, specially prepared for the Work of the Contract, to illustrate a portion of the Work.
- I. Other Submittals: Technical data, test reports, calculations, surveys, certifications, special warranties and guarantees, operation and maintenance data, extra stock and other submitted information and products shall not be considered as Contract Documents but shall be information from Contractor to Architect to illustrate a portion of the Work for confirmation of understanding of design intent.

1.04 PROJECT COORDINATOR

- A. Project Coordinator: Construction Manager.
- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for material delivery access, traffic, and parking facilities.
 - 1. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 10 00 - Summary.
- F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- G. Make the following types of submittals to Architect through the Project Coordinator:
 - 1. Requests for Interpretation or Information.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.

5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Correction Punch List and Final Correction Punch List for Substantial Completion.
11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
 1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation or Information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
 2. Contractor and Architect are required to use this service.
 3. It is Contractor's responsibility to submit documents in allowable format.
 4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
 5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
 6. Unless specifically requested, paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
 7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.
- B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the Contract Sum.
- C. Submittal Service: The selected service is:
 1. Bluebeam Software Inc.; Bluebeam Revu Studio: www.bluebeam.com.
 2. Other Service acceptable to both District and Architect.
 - a. Direct email with PDF copies.

- D. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.
 - 1. Representatives of District are scheduled and included in this training.
- E. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for District.

3.02 PRECONSTRUCTION MEETING

- A. District will schedule a meeting after Notice of Award.
- B. Attendance Required:
 - 1. District.
 - 2. Architect.
 - 3. Contractor.
- C. Agenda:
 - 1. Execution of District-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 - 5. Submission of initial Submittal schedule.
 - 6. Designation of personnel representing the parties to Contract and Architect.
 - 7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 8. Scheduling.
 - 9. Scheduling activities of a Geotechnical Engineer.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, District, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

- A. Schedule meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
 - 1. Contractor.
 - 2. District.
 - 3. Architect.
 - 4. Contractor's superintendent.
 - 5. Major subcontractors.
 - 6. Inspector of Record.
- C. Agenda:
 - 1. Distribute and discuss list of subcontractors and suppliers.

2. Project Communication Procedures: Review requirements and administrative requirements for written and oral communications.
 - a. Review requirements and administrative procedures Contractor may wish to institute for identification and reporting purposes.
 3. Change Procedures: Review requirements and administrative procedures for Change Orders, Construction Change Directives, Architect's supplemental instructions and Contractor's Requests for Interpretation or Information.
 4. Use of premises by District and Contractor.
 - a. Site access restrictions, if any, and requirements to avoid disruption of operations at adjoining facilities or operations.
 - b. Construction Facilities and Temporary Utilities: Designate storage and staging areas, construction office areas; review temporary utility provisions; present District's requirements for use of premises.
 5. District's requirements.
 6. Construction facilities and controls provided by District.
 7. Temporary utilities provided by District.
 8. Survey and building layout.
 9. Security and housekeeping procedures.
 10. Schedules.
 - a. Distribute and discuss initial construction schedule and critical work sequencing of major elements of Work;
 - b. Include coordination of District Furnished / Contractor Installed (OFCI) products;
 11. Application for payment procedures.
 12. Procedures for testing.
 13. Procedures for maintaining record documents.
 14. Requirements for start-up of equipment.
 15. Inspection and acceptance of equipment put into service during construction period.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, District, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work at maximum bi-weekly intervals.
- B. Meeting Time and Location: As mutually agreed by District, Architect, and Contractor, at on-site location.
- C. Special Meetings: As necessary, Construction Manager may convene special meetings to discuss specific construction issues in detail and to plan specific activities.
 1. See Section 01 70 00 - Execution and Closeout Requirements.
- D. Attendance Required:
 1. Contractor.

2. District.
 3. Architect.
 4. Contractor's superintendent.
 5. Major subcontractors.
- E. Agenda:
1. Review minutes of previous meetings.
 2. Review of work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems that impede, or will impede, planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Review of RFIs log and status of responses.
 7. Review of off-site fabrication and delivery schedules.
 8. Maintenance of progress schedule.
 9. Corrective measures to regain projected schedules.
 - a. Develop corrective measures and procedures, including but not necessarily limited to additional personnel loading to regain planned schedule.
 10. Planned progress during succeeding work period.
 11. Coordination of projected progress.
 12. Maintenance of quality and work standards.
 13. Effect of proposed changes on progress schedule and coordination.
 14. Other business relating to work.
- F. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, District, participants, and those affected by decisions made.

3.05 CONSTRUCTION PROGRESS SCHEDULE

- A. Contractor's Review: All schedules shall be reviewed and approved by Contractor prior to submission for Architect's and Construction Manager's review.
- B. Reviews by Architect and Construction Manager will be to ascertain the general status of construction and shall not be interpreted to establish or approve the means, methods, techniques and sequences of construction.

3.06 DAILY CONSTRUCTION REPORTS

- A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.
- B. In addition to transmitting electronically a copy to District and Architect, submit two printed copies at weekly intervals.
 1. Submit in format acceptable to District.
 2. Submit using required form, a sample of which is appended to this section.

- C. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
1. Date.
 2. High and low temperatures, and general weather conditions.
 3. List of subcontractors at Project site.
 4. List of separate contractors at Project site.
 5. Approximate count of personnel at Project site.
 - a. Include a breakdown for supervisors, laborers, journeymen, equipment operators, and helpers.
 6. Major equipment at Project site.
 7. Material deliveries.
 8. Safety, environmental, or industrial relations incidents.
 9. Meetings and significant decisions.
 10. Unusual events (submit a separate special report).
 11. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
 12. Meter readings and similar recordings.
 13. Emergency procedures.
 14. Directives and requests of Authority(s) Having Jurisdiction (AHJ).
 15. Change Orders received and implemented.
 16. Testing and/or inspections performed.
 17. List of verbal instruction given by District and/or Architect.
 18. Signature of Contractor's authorized representative.

3.07 PROGRESS PHOTOGRAPHS

- A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.
- B. Maintain one set of all photographs at project site for reference; same copies as submitted, identified as such.
- C. Photography Type: Digital; electronic files.
- D. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Architect.
- E. In addition to periodic, recurring views, take photographs of each of the following events:
 1. Completion of site clearing.
 2. Excavations in progress.
 3. Foundations in progress and upon completion.
 4. Structural framing in progress and upon completion.

5. Enclosure of building, upon completion.
 6. Final completion, minimum of ten (10) photos.
- F. Take photographs as evidence of existing project conditions as follows:
1. Interior views: each elevation, floor and ceilings prior to demolition.
 2. Exterior views: each elevation, roof and areas adjacent to construction limits.
- G. Views:
1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
 2. Consult with Architect for instructions on views required.
 3. Provide factual presentation.
 4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
 5. Point of View Sketch: Provide sketch identifying point of view of each photograph.
- H. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
1. Delivery Medium: Via email.
 2. File Naming: Include project identification, date and time of view, and view identification.
 3. Point of View Sketch: Include digital copy of point of view sketch with each electronic submittal; include point of view identification in each photo file name.
 4. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.
 5. Hard Copy: Printed hardcopy (grayscale) of PDF file and point of view sketch.

3.08 COORDINATION DRAWINGS

- A. See Section 01 31 14 - Facility Services Coordination.
- B. Provide information required by Project Coordinator for preparation of coordination drawings.
- C. Review drawings prior to submission to Architect.

3.09 REQUESTS FOR INTERPRETATION OR INFORMATION (RFI)

- A. Definition: A request seeking one of the following:
 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in the Contract Documents.
 2. A resolution to an issue which has arisen due to field conditions and affects design intent.

- B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 - 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
 - b. Do not forward requests which solely require internal coordination between subcontractors.
 - 2. Prepare in a format and with content acceptable to District.
 - 3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
 - 1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
 - a. Submit RFIs from subcontractors and material suppliers through, be reviewed by and be attached to an RFI prepared, signed and submitted by Contractor.
 - 1) RFIs from subcontractors and material suppliers are to be:
 - (a) Reviewed by Contractor.
 - (b) Corrected and rewritten to clarify as required by Contractor.
 - (c) Placed on the proper form, then signed, and submitted by Contractor.
 - (d) RFIs submitted directly by subcontractors or material suppliers will be returned unanswered to the Contractor.
 - 2) RFIs submitted directly by subcontractors or material suppliers will be returned unanswered to the Contractor.
 - b. Review all subcontractor- and supplier-initiated RFIs and take actions to resolve issues of coordination, sequencing and layout of the Work.
 - 1) RFIs submitted to request clarification of issues related to means, methods, techniques and sequences of construction or for establishing trade jurisdictions and scopes of subcontracts will be returned without response.
 - (a) Such issues are solely the Contractor's responsibility.
 - 2) Contractor is responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.
 - 2. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
 - a. Approval of submittals (use procedures specified elsewhere in this section).
 - b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
 - c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
 - d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).

3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
 4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
 - a. The District reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.
- E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
1. Official Project name and number, and any additional required identifiers established in Contract Documents.
 2. District's, Architect's, and Contractor's names.
 3. Discrete and consecutive RFI number, and descriptive subject/title.
 4. Issue date, and requested reply date.
 5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 - a. Inability to determine from the Contract Documents the exact material, process, or system to be installed;
 - b. Or when the elements of construction are required to occupy the same space (interference);
 - c. Or when an item of Work is described differently at more than one place in the Contract Documents.
 7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
 - a. In all cases, furnish all information required for the Architect to analyze and/or understand the circumstances causing the RFI and prepare a clarification or direction as to proceed for RFIs issued to request clarification of issues related to:
 - 1) Means, methods, techniques and sequences of construction, for example
 - 2) Pipe and duct routing, clearances;
 - 3) Specific locations of Work shown diagrammatically;
 - 4) Apparent interferences and similar items.
 - 5) If information included with this type RFI by the Contractor is insufficient, the RFI will be returned unanswered.
- F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

- G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
 - 1. Indicate current status of every RFI. Update log promptly and on a regular basis.
 - 2. Note dates of when each request is made, and when a response is received.
 - 3. Highlight items requiring priority or expedited response.
 - 4. Highlight items for which a timely response has not been received to date.
 - 5. Identify and include improper or frivolous RFIs.
- H. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
 - 1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to District.
 - 1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
 - 2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
 - 3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
 - 4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.10 SUBMITTAL SCHEDULE

- A. Submit to Architect for review a schedule for submittals in tabular format.
 - 1. Submit at the same time as the preliminary schedule.
 - a. Submit initial Submittals Schedule within 14 days of date of Notice of Award of construction.
 - b. After review and return by Architect, resubmit Submittals Schedule within 10 days and thereafter submit updated Submittals Schedules at each Construction Progress Meeting.
 - c. Submit one copy each to Owner and Architect.
 - 2. Coordinate with Contractor's construction schedule and schedule of values.
 - 3. Format schedule to allow tracking of status of submittals throughout duration of construction.
 - a. Prepare schedules in Gantt format using software at Contractor's option, providing clear indication of sequencing and scheduling of Work, for determination of "critical path" of construction progress.

- 1) Submittals shall be connected to the related construction element by a graphically indicated critical path on the same page.
- 2) Present schedules using opaque reproductions on substantial paper, with sheet size a multiple of 8-1/2 by 11 inches and large enough to clearly read characters.
4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.

3.11 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 1. Product data.
 2. Shop drawings.
 3. Samples for selection.
 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.12 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 1. Design data.
 2. Certificates.
 3. Test reports.
 4. Inspection reports.
 5. Manufacturer's instructions.
 6. Manufacturer's field reports.
 7. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for District.

3.13 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Submit Correction Punch List for Substantial Completion.
- B. Submit Final Correction Punch List for Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
 1. Project record documents.

2. Operation and maintenance data.
 - a. Include operation and maintenance data submittals in Submittals Schedule specified above.
 - b. Provide space for review action stamps and, if required by governing authorities having jurisdiction, license seal of design Professional, if applicable.
 3. Warranties.
 4. Bonds.
 5. Other types as indicated.
- D. Submit for District's benefit during and after project completion.

3.14 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format with renderable text; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Small Size Sheets, Not Larger Than 11 by 17 inch: Submit one copy; the Contractor shall make his own copies from original returned by the Architect after making his own file copy.
- C. Extra Copies at Project Closeout: See Section 01 78 00.
- D. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 1. After review, produce duplicates.
 2. Retained samples will not be returned to Contractor unless specifically so stated.
 3. Quantity:
 - a. Submit minimum of four (4) samples of each of color, texture and pattern.
 - b. Submit one item only of actual assembly or product.
 - c. Unless otherwise noted, full-size and complete samples will be returned and may be incorporated into field mock-ups and the Work.

3.15 SUBMITTAL PROCEDURES

- A. General Requirements:
 1. Use a separate transmittal for each item.
 2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
 3. Transmit using approved form.
 4. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
 5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
 - a. For example:
 - 1) 09 21 16-1 - First submittal for Section 09 21 16 - Gypsum Board Assemblies.
 - 2) 09 21 16-2 - Second submittal for Section 09 21 16 - Gypsum Board Assemblies.

- b. Use same number for resubmittals as original submittal, followed by a letter indicating sequential resubmittal. For example:
 - 1) 09 21 16-2A - Resubmission of second submittal for Section 09 21 16 - Gypsum Board Assemblies.
 - 2) 09 21 16-2B - Second resubmission of second submittal for Section 09 21 16 - Gypsum Board Assemblies.
- 6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
 - a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
 - b. Field measurements have been determined and verified.
 - c. Conformance with requirements of Contract Drawings and Specifications is confirmed.
 - d. Catalog numbers and similar data are correct.
 - e. Work being performed by various subcontractors and trades is coordinated.
 - f. Field construction criteria have been verified, including confirmation that information submitted has been coordinated with the work being performed by others for District and actual site conditions.
 - g. All deviations from requirements of Drawings and Specifications have been identified and noted.
- 7. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
 - a. Send submittals in electronic format via email to Architect.
 - b. Upload submittals in electronic form to Electronic Document Submittal Service website.
- 8. Schedule submittals to expedite the Project, and coordinate submission of related items.
 - a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
 - b. For sequential reviews involving Architect's consultants, District, or another affected party, allow an additional 7 days.
- 9. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
 - a. Changes in the Work shall not be authorized by submittals review actions.
 - b. No review action, implicit or explicit, shall be interpreted to authorized changes in the Work.
 - c. Changes shall only be authorized by separate written Contract Change Order or Construction Change Directive, in accordance with the Conditions of the Contract and Section 01 20 00 - Price and Payment Procedures.
- 10. Provide space for Contractor and Architect review stamps.
- 11. When revised for resubmission, identify all changes made since previous submission.

12. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
 13. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
 14. Submittals not requested will be recognized, but will be returned without comment,
- B. Product Data Procedures:
1. Submit only information required by individual specification sections.
 2. Collect required information into a single submittal.
 3. Submit concurrently with related shop drawing submittal.
 4. Do not submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 2. Use of reproductions of Contract Documents in digital data form to create shop drawings is only permitted as defined in Division 01 and individual product sections.
 3. Coordination: Show all field dimensions and relationships to adjacent or critical features of Work.
 4. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
1. Transmit related items together as single package.
 2. Samples will be reviewed for aesthetic, color, or finish selection.
 3. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
 4. Color Selection Samples: Architect will review and select colors for Project only after all colors are received, so that colors may be properly coordinated.
 5. Copies: Submit actual samples. Photographic or printed reproductions will not be accepted.
 6. Review of Field Samples: Review by Architect of field samples will be made for the following example products, as applicable, if not otherwise required and if requested by Contractor.
 - a. Concrete wall finishes and detailing (edges, corners and reveals).
 - b. Concrete paving colors and textures.
 - c. Gypsum board textures and finishes.
 - d. Field-applied paint colors and finishes.

3.16 SUBMITTAL REVIEW

- A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

- B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.
- C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
 - 1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.
- D. Architect's and consultants' actions on items submitted for review:
 - 1. Authorizing purchasing, fabrication, delivery, and installation:
 - a. "Approved", or language with same legal meaning.
 - b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
 - 1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
 - c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
 - 1) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
 - 2) Non-responsive resubmittals may be rejected.
 - 2. Not Authorizing fabrication, delivery, and installation:
 - a. "Revise and Resubmit".
 - 1) Resubmit revised item, with review notations acknowledged and incorporated.
 - 2) Non-responsive resubmittals may be rejected.
 - b. "Rejected".
 - 1) Submit item complying with requirements of Contract Documents.
- E. Architect's and consultants' actions on items submitted for information:
 - 1. Items for which no action was taken:
 - a. "Received" - to notify the Contractor that the submittal has been received for record only.
 - 2. Items for which action was taken:
 - a. "Reviewed" - no further action is required from Contractor.

END OF SECTION



SUBMITTAL / SHOP DRAWING TRANSMITTAL

To:	Ruhnau Clarke Architects	Contractor's Submittal No.	
Attn:	Construction Dept.		
Contractor:		Project Name:	West Hills HS Science Building Modernization
Street:		RCA's Project No.	1-30-50
City, State:		Subcontractor:	

CONTRACTOR TO FILL OUT THE FOLLOWING COVERING ONE COMPLETE SECTION OF THE SPECIFICATIONS ONLY:

Specification Section #:	Section Title:
--------------------------	----------------

<input type="checkbox"/>	Initial Submittal	Scheduled Date of Submittal	
<input type="checkbox"/>	1st Resubmittal	Scheduled Date of Submittal Return	
<input type="checkbox"/>	___ Resubmittal	Date Sent	
<input type="checkbox"/>	Submittal was a previously approved substitution.	Number of Copies	
	Approved Substitution Request Transmittal Form is enclosed.	Number of Samples	

CONTRACTOR COMPLETE EITHER (A) OR (B) FOLLOWING, <u>CHECK ONE</u> :		CONSTRUCTION MANAGERS CERTIFICATION	
(A)	WE HAVE VERIFIED THAT THE MATERIAL OR EQUIPMENT CONTAINED IN THIS SUBMITTAL MEETS ALL THE REQUIREMENTS SPECIFIED OR SHOWN (NO EXCEPTIONS).	THIS IS TO CERTIFY THAT THE CONSTRUCTION MANAGER IS REASONABLY CERTAIN THAT THE MATERIAL SPECIFIED IN THIS SUBMITTAL MEETS THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, AND THE SUBMITTAL IS COMPLETE PER THE CONTRACT DOCUMENTS.	
	<input type="checkbox"/>	SIGNATURE: _____	
(B)	WE HAVE VERIFIED THAT THE MATERIAL OR EQUIPMENT CONTAINED IN THIS SUBMITTAL MEETS ALL THE REQUIREMENTS SPECIFIED OR SHOWN, EXCEPT FOR THE FOLLOWING DEVIATIONS (LIST DEVIATIONS ON AN ATTACHED SHEET OR INDICATE DEVIATIONS CLEARLY ON SHOP DRAWINGS OR SUBMITTALS).	CONTRACTORS CERTIFICATION	
	<input type="checkbox"/>	THIS IS TO CERTIFY THAT THE CONTRACTOR IS REASONABLY CERTAIN THAT THE MATERIAL SPECIFIED IN THIS SUBMITTAL MEETS THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.	
		SIGNATURE: _____	

ARCHITECT'S USE ONLY BELOW THIS LINE.

Action:

- No Exception Taken
 Make Corrections Noted
 Rejected/Resubmit
 Revise and Resubmit

Comments:

Date Received By RRC:

Date Sent to Consultant:

- Structural _____
- Mechanical _____
- Electrical _____
- Other _____

Date Received From:

Consultant _____

No. of Copies Received _____

Final Distribution: Contractor _____ Inspector _____ District/P.M. _____ Architect _____

Final Distribution Date: _____

**SECTION 01 30 00.01
REQUEST FOR INTERPRETATION**

RFI NUMBER: _____

DATE: _____

PROJECT NAME: SCIENCE BUILDING MODERNIZATION

PROJECT NO.: 1-30-50

TO: RUHNAU CLARKE ARCHITECTS

. 5751 Palmer Way, Suite C, Carlsbad, California 92010

Attention: _____

Contractor: _____

Address: _____

BRIEF SUMMARY OF RFI: _____

Drawing No. _____ Detail No. _____

Specification Section _____ Title _____

. Page _____ Paragraph _____

DETAILS OF THIS RFI: _____

SUGGESTED SOLUTION: _____

Response required by: _____ (min. 3 full days) Submitted By: _____

Organization: _____

RESPONSE: _____

Attachments: _____

Response By: _____ Date: _____

Organization: _____

Copies: __ File __ District __ Structural __ Mechanical __ Plumbing __ Electrical
__ Civil __ Landscape __ other consultants

END OF RFI

SECTION 01 35 50
REQUESTS FOR ELECTRONIC FILES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements to request electronic construction document files from Architect.
- B. Hold Harmless Agreement form.

1.02 RELATED SECTIONS

- A. Section 01 30 00 - Administrative Requirements: Shop Drawings, Product Data and Samples.
- B. Section 01 70 00 - Execution and Closeout Requirements.
- C. Divisions 31 through 33 - Site Work.

1.03 REQUIREMENTS

- A. Electronic files have legal ramifications as information therein can be modified.
- B. In order to receive this electronic information, the following Hold Harmless Agreement form must be executed in its entirety, including signature by a company officer.
- C. Costs for processing and handling electronic files, however limited, will be \$250.00

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SECTION.)

PART 3 - EXECUTION

3.01 ELECTRONIC FILE TRANSFER PROCEDURE

- A. Submit a check in the amount of \$250.00 along with a list of the requested sheet numbers and an acknowledged copy of this waiver to the office of the Architect, Ruhnau Clarke Architects, 5751 Palmer Way, Suite C, Carlsbad, California 92010.
- B. In order to expedite the transfer, upon receipt of a PDF copy of this acknowledgement, the requested CAD/Revit/BIM files will be sent in the form of a compact disc, DVD, or thumb drive to the recipient, as requested, by UPS, similar delivery service, or other method of electronic transfer after payment is received.
- C. It is expressly understood that any transfer is done as a courtesy and can be revoked at any time by the Architect.

Agreement is on next page

END OF SECTION

SECTION 01 35 53
SECURITY PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Security measures including formal security program, entry control, personnel identification, guard service, and miscellaneous restrictions.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: use of premises and occupancy.
- B. Section 01 50 00 - Temporary Facilities and Controls: Temporary lighting.

1.03 SECURITY PROGRAM

- A. Protect Work, existing premises and District's operations from theft, vandalism, and unauthorized entry.
- B. Initiate program in coordination with District's existing security system at project mobilization.
- C. Maintain program throughout construction period until District acceptance precludes the need for Contractor security.

1.04 ENTRY CONTROL

- A. Restrict entrance of persons and vehicles into Project site and existing facilities.
- B. Allow entrance only to authorized persons with proper identification.
- C. Maintain log of workers and visitors, make available to District on request.
- D. District will control entrance of persons and vehicles related to District's operations.
- E. Contractor shall control entrance of persons and vehicles related to District's operations.
- F. Coordinate access of District's personnel to site in coordination with District's security forces.

1.05 PERSONNEL IDENTIFICATION

- A. Shall be worn by Contractor's superintendent and all sub contractors
- B. Provide identification badge to each person authorized to enter premises.
- C. Badge To Include: Personal photograph, name, assigned number, expiration date and employer.
- D. Maintain a list of accredited persons, submit copy to District on request.
- E. Special badges shall be issued to construction personnel when term of construction exceeds six months.
- F. Require return of badges at expiration of their employment on the Work.

1.06 GUARD SERVICE

- A. Employ uniformed guard service to provide watch persons at site during all non-working hours.

- B. The phone number for security is _____.
- C. All personnel must obey and act immediately upon any request by security.
- D. In an emergency, from inside the facility, dial _____. Outside the facility, dial 911.

1.07 RESTRICTIONS

- A. Do not allow cameras on site or photographs taken except by written approval of District.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Contractor Quality assurance submittals.
- B. Quality assurance.
- C. Testing and inspection agencies and services.
- D. Contractor's construction-related professional design services.
- E. Control of installation.
- F. Mock-ups.
- G. Tolerances.
- H. Manufacturers' field services.
- I. Defect Assessment.

1.02 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- B. Section 01 41 00 - Regulatory Requirements: Compliance with applicable codes, ordinances and standards.
- C. Section 01 42 19 - Reference Standards.
- D. Section 01 45 33 - Code-Required Special Inspections: Testing laboratory services and inspections required by Division of the State Architect (DSA), during the course of construction.
- E. Section 01 60 00 - Product Requirements: Requirements for material and product quality.
 - 1. Product options, substitutions, transportation and handling requirements, storage and protection requirements, and system completeness requirements.

1.03 REFERENCE STANDARDS

- A. IAS AC89 - Accreditation Criteria for Testing Laboratories.

1.04 DEFINITIONS

- A. Contractor's Quality Control Plan: Contractor's management plan for executing the Contract for Construction.

1.05 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations, pertaining to, but not limited to the following:
 - 1. Temporary sheeting, shoring, or supports.

2. Temporary scaffolding.
3. Temporary bracing.
4. Temporary falsework for support of spanning or arched structures.
5. Temporary stairs or steps required for construction access only.
6. Temporary hoist(s) and rigging.
7. Investigation of soil conditions to support construction equipment.

1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Designer's Qualification Statement: Submit for Architect's knowledge as contract administrator, or for District's information.
 1. Include information for each individual professional responsible for producing, or supervising production of, design-related professional services provided by Contractor.
 - a. Full name.
 - b. Professional licensure information.
 - c. Statement addressing extent and depth of experience specifically relevant to design of items assigned to Contractor.
- C. Quality Control Submittals Schedule
 1. Schedule Format: Include quality control submittals on Submittals Schedule specified in accordance with General Conditions
 2. Schedule Content: List all tests, inspections and reports specified to be submitted, indicating submittal number, submittal type (field test, field inspection, fabrication inspection, etcetera), scheduled date of quality control activity and date report should be made.
- D. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for District's information.
 1. Include calculations that have been used to demonstrate compliance to performance and regulatory criteria provided, and to determine design solutions.
 2. Include required product data and shop drawings.
 3. Include a statement or certification attesting that design data complies with criteria indicated, such as building codes, loads, functional, and similar engineering requirements.
 4. Include signature and seal of design professional responsible for allocated design services on calculations and drawings.
- E. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.

- d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Compliance with Contract Documents.
 - k. When requested by Architect, provide interpretation of results.
2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for District's information.
- F. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
- 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- G. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the District's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- H. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for District.
- 1. Submit report in duplicate within 30 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.
- I. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for District.
- 1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.
 - 2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or District.

1.07 QUALITY ASSURANCE

- A. Testing Agency Qualifications:
- 1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

3. Qualification Statement: Provide documentation showing testing laboratory is approved by Division of the State Architect.
 4. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.
- B. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in California.
- C. Contractor's Quality Control (CQC) Plan:
1. Prior to start of work, submit a comprehensive plan describing how contract deliverables will be produced. Tailor CQC plan to specific requirements of the project. Include the following information:
 - a. Management Structure: Identify personnel responsible for quality. Include a chart showing lines of authority.
 - 1) Include qualifications (in resume form), duties, responsibilities of each person assigned to CQC function.
 - b. Management Approach: Define, describe, and include in the plan specific methodologies used in executing the work.
 - 1) Management and control of documents and records relating to quality.
 - 2) Communications.
 - 3) Coordination procedures.
 - 4) Resource management.
 - 5) Process control.
 - 6) Inspection and testing procedures and scheduling.
 - 7) Control of noncomplying work.
 - 8) Tracking deficiencies from identification, through acceptable corrective action, and verification.
 - 9) Control of testing and measuring equipment.
 - 10) Project materials certification.
 - 11) Managerial continuity and flexibility.
 - c. District will not make a separate payment for providing and maintaining a Quality Control Plan. Include associated costs in Bid price.
 - d. Acceptance of the plan is required prior to start of construction activities not including mobilization work. District's acceptance of the plan will be conditional and predicated on continuing satisfactory adherence to the plan. District reserves the right to require Contractor to make changes to the plan and operations, including removal of personnel, as necessary, to obtain specified quality of work results.
- D. Quality-Control Personnel Qualifications. Engage a person with requisite training and experience to implement and manage quality assurance (QA) and quality control (QC) for the project.

1.08 REFERENCES AND STANDARDS - SEE SECTION 01 42 19

1.09 REGULATORY REQUIREMENTS FOR TESTING AND INSPECTION

- A. Inspections, testing and approvals as required by authorities having jurisdiction. Refer to Section 01 41 00 - Regulatory Requirements and Section 01 45 33 - Code-Required Special Inspections.
- B. Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Unless more stringent requirements are indicated or specified, comply with manufacturer's instructions and recommendations, reference standards and building code research report requirements in preparing, fabricating, erecting, installing, applying, connecting and finishing Work.
- C. Deviations from Standards and Code Compliance and Manufacturer's Instructions and Recommendations: Document and explain all deviations from reference standards and building code research report requirements and manufacturer's product installation instructions and recommendations, including acknowledgement by the manufacturer that such deviations are acceptable and appropriate for the Project.

1.10 TESTING AND INSPECTION AGENCIES AND SERVICES

- A. District will employ and pay for services of an independent testing agency approved by DSA to perform specified testing.
- B. As indicated in individual specification sections, District or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- D. Contractor Employed Agency:
 - 1. Laboratory Qualifications: Accredited by IAS according to IAS AC89.
 - 2. Laboratory: Authorized to operate in California.
 - 3. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
 - 4. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTRACTOR'S QUALITY ASSURANCE

- A. Quality Requirements: Work shall be accomplished in accordance with quality requirements of the Drawings and Specifications, including, by reference, all Codes, laws, rules, regulations and standards. When no quality basis is prescribed, the quality shall be in accordance with the best accepted practices of the construction industry for the locale of the Project, for projects of this type.

- B. Quality Control Personnel: Contractor shall employ and assign knowledgeable and skilled personnel as necessary to perform quality control functions to ensure that the Work is provided as required.

3.02 CONTROL OF INSTALLATION

- A. Quality of Products: Unless otherwise indicated or specified, all products shall be new, free of defects and fit for the intended use.
- B. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- C. Comply with manufacturers' instructions, including each step in sequence.
- D. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- E. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- F. Have work performed by persons qualified to produce required and specified quality.
- G. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.
- I. Quality of Installation: All Work shall be produced plumb, level, square and true, or true to indicated angle, and with proper alignment and relationship between the various elements.
- J. Protection of Existing and Completed Work: Take all measures necessary to preserve and protect existing and completed Work free from damage, deterioration, soiling and staining, until Acceptance by the District.
- K. Verification of Quality: Work shall be subject to verification of quality by District, or Architect in accordance with provisions of the General Conditions of the Contract.
 - 1. Contractor shall cooperate by making Work available for inspection by District, Architect or their designated representatives.
 - 2. Such verification may include mill, plant, shop, or field inspection as required.
 - 3. Provide access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.
 - 4. Provide all information and assistance as required, including that by and from subcontractors, installers, fabricators, materials suppliers and manufacturers, for verification of quality by District, or Architect.
 - 5. Contract modifications, if any, resulting from such verification activities shall be governed by applicable provisions in the General Conditions.

3.03 MOCK-UPS

- A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.

- B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
- C. Notify Architect fifteen (15) working days in advance of dates and times when mock-ups will be constructed.
- D. Provide supervisory personnel who will oversee mock-up construction. Provide workers that will be employed during the construction at Project.
- E. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
- F. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- G. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.
 - 1. Architect will issue written comments within seven (7) working days of initial review and each subsequent follow up review of each mock-up.
 - 2. Make corrections as necessary until Architect's approval is issued.
- H. Architect will use accepted mock-ups as a comparison standard for the remaining Work.
- I. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.
- J. Where possible salvage and recycle the demolished mock-up materials.

3.04 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.05 TESTING AND INSPECTION

- A. See individual specification sections for testing required.
- B. Testing Agency Duties:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
 - 6. Perform additional tests and inspections required by Architect.
 - 7. Submit reports of all tests/inspections specified.
- C. Limits on Testing/Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the Work.
 3. Agency may not assume any duties of Contractor.
 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 6. Arrange with District's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 7. Inspections and Tests by Authorities Having Jurisdiction:
 - a. Contractor shall cause all tests and inspections to be made for Work under this Contract, as required by Building Departments, Department of Public Works, Fire Department, Health Department and similar agencies having jurisdiction.
 - b. Excepted as specifically noted, scheduling, conducting and paying for such inspections shall be solely the Contractor's responsibility.
 8. Inspections and Tests by Serving Utilities:
 - a. Contractor shall cause all tests and inspections required by serving utilities to be made for Work under this Contract.
 - b. Scheduling, conducting and paying for such inspections shall be solely the Contractor's responsibility.
- E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.06 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of

surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
 - 1. Observer subject to approval of Architect.
 - 2. Observer subject to approval of District.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.07 FIELD QUALITY CONTROL SUBMITTALS

- A. Administration: Make all submittals to the Architect, unless otherwise directed.
- B. Submittal Identification: Identify each submittal by Specification Section number followed by a number indicating sequential submittal for that Section. Coordinate submittal numbers with submittals specified in Section 01 30 00 - Administrative Requirements.
 - 1. Resubmittals shall use same number as original submittal, followed by a letter indicating sequential resubmittal.

03 30 00 - 1	First submittal for Section 03 30 00 - Cast in Place Concrete.
03 30 00 - 2	Second submittal for Section 03 30 00 - Cast in Place Concrete.
03 30 00 - 2A	Resubmittal of second submittal for Section 03 30 00 - Cast in Place Concrete.
03 30 00 - 2B	Second resubmittal of second submittal for Section 03 30 00 - Cast in Place Concrete.

- C. Project Identification: Title each submittal with Project name, submittal date and Architect's Project number.
- D. Copies: Provide PDF copies electronically transmitted or submit 6 copies, minimum, of reports of quality control reports on dry-process xerographic copies only.
- E. Contractor's Review:
 - 1. Submittals shall be made in accordance with requirements specified herein and in individual Sections.
 - 2. Indicate clearly on each submittal the specified or referenced values for each quality control activity and the values obtained.
 - 3. Note clearly and sign each submittal certifying that reported quality control activity "Conforms" or "Does Not Conform".
- F. Changes and Deviations:
 - 1. Identify all deviations from requirements of Drawings and Specifications.
 - 2. Changes in the Work shall not be authorized by submittals review actions.
 - 3. No review action, implicit or explicit, shall be interpreted to authorized changes in the Work.
 - 4. Changes shall only be authorized by separate written Change Order or Construction Change Directive, in accordance with the General Conditions and 01 20 00 - Price and Payment Procedures.

- G. Record Submittals: When record submittals are specified, submit three copies or sets only. Record submittals will not be reviewed but will be retained for historical and maintenance purposes.
- H. Unsolicited Submittals: Unsolicited submittals will be returned unreviewed.

3.08 ARCHITECT'S REVIEW

- A. General:
 - 1. Submitted Report review by Architect and Architect's consultants shall be only for general conformance with the design concept and requirements based on the information presented.
 - 2. Neither Architect nor Architect's consultants shall verify submitted quality control data.
- B. Contract Requirements:
 - 1. Review by Architect and Architect's consultants shall not relieve the Contractor from compliance with requirements of the Drawings and Specifications.
 - 2. Changes shall only be authorized by separate written Change Order or Construction Change Directive, in accordance with the General Conditions and 01 20 00 - Price and Payment Procedures.
- C. Observations by Architect and Architect's Consultants: Periodic and occasional observations of Work in progress will be made by Architect and Architect's consultants as deemed necessary to review progress of Work and general conformance with design intent.

3.09 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not conforming to specified requirements, at no change in Contract Sum or Contract Time.
- B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.
- C. Architect's Acceptance and Rejection of Work: Architect reserves the right to reject all Work not in conformance to the requirements of the Drawings and Specifications.
- D. Acceptance of Non-Conforming Work: Acceptance of non-conforming Work, without specific written acknowledgement and approval of the District, shall not relieve the Contractor of the obligation to correct such Work.
 - 1. Acceptance of structurally related non-conforming work shall be submitted to DSA for review and approval.
- E. Contract Adjustment for Non-conforming Work:
 - 1. Should Architect or District determine that it is not feasible or in District's interest to require non-conforming Work to be repaired or replaced, an equitable reduction in Contract Sum shall be made by agreement between District and Contractor.
 - 2. If equitable amount cannot be agreed upon, a Construction Change Directive will be issued and the amount in dispute resolved in accordance with applicable provisions of the General Conditions.

- F. Non-Responsibility for Non-Conforming Work: Architect and Architect's consultants disclaim any and all responsibility for Work produced not in conformance with the Drawings and Specifications.

END OF SECTION

SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 AUTHORITY AND PRECEDENCE OF CODES, ORDINANCES AND STANDARDS

- A. Authority: All codes, ordinances and standards referenced in the Drawings and Specifications shall have the full force and effect as though printed in their entirety in the Specifications.
- B. Precedence:
 - 1. Where specified requirements differ from the requirements of applicable codes, ordinances and standards, the more stringent requirements take precedence.
 - 2. Where the Drawings or Specifications require or describe products or execution of better quality, higher standard or greater size than required by applicable codes, ordinances and standards, the Drawings and Specifications take precedence so long as such increase is legal.
 - 3. Where no requirements are identified in the Drawings or Specifications, comply with all requirements of applicable codes, ordinances and standards of authorities having jurisdiction.
- C. Applicable Codes, Laws and Ordinances: Refer also to Section 01 10 00 - Summary, regarding permits and licenses.
 - 1. Performance of the Work is be governed by all applicable laws, ordinances, rules and regulations of Federal, State and local governmental agencies and jurisdictions having authority over the Project, including accessibility requirements.
 - 2. Performance of the Work shall be accomplished in conformance with all rules and regulations of public utilities, utility districts and other agencies serving the development.
 - 3. Where such laws, ordinances, rules and regulations require more care or greater time to accomplish Work, or require better quality, higher standards or greater size of products, Work shall be accomplished in conformance to such requirements with no change to the Contract Time and Contract Sum, except where changes in laws, ordinances, rules and regulations occur subsequent to the execution date of the Agreement.
- D. Applicable Building Codes: References on the Drawings or in the Specifications to "code" or "building code" not otherwise identified shall mean the codes specified below, together with all additions, amendments, changes, and interpretations adopted by code authorities of the jurisdiction having authority over the Project.
- E. Performance of the Work shall meet or exceed the minimum regulatory requirements applicable to this project are summarized in this section, as adopted by Division of the State Architect:
 - 1. Part 1, Title 24 CCR - 2019 California Administrative Code.
 - 2. Part 2, Title 24 CCR - 2019 California Building Code (CBC); Volumes 1 and 2.
 - a. Based on ICC (IBC) - ICC International Building Code, 2018.
 - 3. Part 3, Title 24 CCR - 2019 California Electrical Code (CEC, NFPA 70-NEC 2017).

4. Part 4, Title 24 CCR - 2019 California Mechanical Code (CMC).
 - a. Based on IAPMO (UMC) - Uniform Mechanical Code, 2018.
 5. Part 5, Title 24 CCR - 2019 California Plumbing Code (CPC).
 - a. Based on IAPMO (UPC) - Uniform Plumbing Code, 2018.
 6. Part 6, Title 24 CCR - 2019 California Energy Code.
 7. Part 9, Title 24 CCR - 2019 California Fire Code (CFC).
 - a. Based on ICC (IFC) - International Fire Code; 2018.
 8. Part 10, Title 24 CCR - 2019 California Existing Buildings Code.
 - a. Based on ICC (IEBC) - ICC International Existing Buildings Code, 2018.
 9. Part 11, Title 24 CCR - 2019 California Green Building Standards Code (CalGreen).
 10. Part 12, Title 24 CCR - 2019 California Referenced Standards Code.
- F. Erosion and Sedimentation Control Regulations: .
1. California Codes and Regulations; Title 24, California Building Code, Parts 1 & 2.
 2. State of California State Water Resources Control Board Regulations.
 3. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit.

1.02 SUMMARY OF REFERENCE STANDARDS

- A. Regulatory requirements applicable to this project are the following:
- B. California Referenced Standards Code: Chapter 12-7-4 Fire Resistive Standards, for fire rated doors.
- C. National Fire Protection Association (NFPA): (Partial List of Applicable Standards)
 1. Reference CBC for applicable NFPA Standards - 2019 CBC (SFM) Chapter 35.
 2. NFPA 13 - Standard for the Installation of Sprinkler Systems (CA Amended); is current; use 2016, as amended in 2019 CBC Ch.35 Referenced Standards.
 3. NFPA 14 - Standard for the Installation of Standpipe and Hose Systems, as amended in 2019 CBC Ch.35 Referenced Standards.
 4. NFPA 24 - Standard for the Installation of Private Fire Service Mains and Their Appurtenances is current; use 2016, as amended in 2019 CBC Ch.35 Referenced Standards.
 5. NFPA 70 - National Electrical Code.
 - a. Use 2017 as indicated in 2019 CBC Ch.35 Referenced Standards.
 6. NFPA 72 - National Fire Alarm and Signaling Code (CA Amended) is current; use 2016 as amended in 2019 CBC Ch.35 Referenced Standards.
 7. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016 is current; use 2016 as indicated in 2019 CBC Ch.35 Referenced Standards.
 8. NFPA 105 - Standard for the Installation of Smoke Door Assemblies and other Opening Protectives; 2016 is current; use 2016 as indicated in 2019 CBC Ch.35 Referenced Standards..

- 9. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2019.
- D. 28 CFR 35 - Nondiscrimination on the Basis of Disability in State and Local Government Services; Final Rule; Department of Justice.
- E. 28 CFR 36 - Nondiscrimination by Public Accommodations and in Commercial Facilities; Final Rule; Department of Justice.
- F. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines.
- G. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- H. 29 CFR 1910 - Occupational Safety and Health Standards.

1.03 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 42 19
REFERENCE STANDARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements relating to referenced standards.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue specified in the individual specification sections, except where a specific date is established by applicable code.
- C. Obtain copies of standards when required by Contract Documents.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Date of Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect shall be altered by Contract Documents by mention or inference otherwise in any reference document.

PART 2 CALIFORNIA DEPARTMENT OF GENERAL SERVICES, DIVISION OF THE STATE ARCHITECT

2.01 INTERPRETATION OF REGULATIONS

- A. Document IR A-5 - Acceptance of Products, Materials, and Evaluations Reports; Revised 1-27-17 .
- B. Current listings are on the DGS website:
<http://www.dgs.ca.gov/dsa/Resources/IRManual.aspx>.

PART 3 UNITED STATES GOVERNMENT AND RELATED AGENCIES DOCUMENTS

3.01 CFR -- CODE OF FEDERAL REGULATIONS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. 16 CFR 260.13 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; Recycled Content.
- C. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials.
- D. 28 CFR 36 - Nondiscrimination by Public Accommodations and in Commercial Facilities; Final Rule; Department of Justice.
- E. 29 CFR 1910 - Occupational Safety and Health Standards.

- F. 29 CFR 1910, Subpart D - Walking-Working Surfaces, 1910.21-1910.30.
- G. 29 CFR 1910.23 - Ladders.
- H. 29 CFR 1910.38 - Emergency action plans.
- I. 29 CFR 1910.132-138 - Personal Protective Equipment.
- J. 29 CFR 1910.134 - Respiratory protection.
- K. 29 CFR 1926.62 - Lead.
- L. 29 CFR 1926.1101 - Asbestos.
- M. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines.
- N. 39 CFR 111 - U.S. Postal Service Standard 4C.
- O. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency.
- P. 40 CFR 60 - Standards of Performance for New Stationary Sources.
- Q. 40 CFR 273 - Standards For Universal Waste Management.
- R. 40 CFR 280 - Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks.
- S. 40 CFR 761 - Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution In Commerce, And Use Prohibitions.
- T. 47 CFR 15 - Radio Frequency Devices.
- U. 47 CFR 68 - Connection of Terminal Equipment to the Telephone Network.
- V. 49 CFR 37 - Transportation Services for Individuals with Disabilities (ADA).
- W. 49 CFR 178 - Specifications for Packaging.
- X. 49 CFR 192.285 - Plastic Pipe: Qualifying Persons to Make Joints.

3.02 CPSC -- CONSUMER PRODUCTS SAFETY COMMISSION

- A. CPSC Pub. No. 325 - Public Playground Safety Handbook.

3.03 EPA -- ENVIRONMENTAL PROTECTION AGENCY

- A. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit.
- B. EPA 600/4-90/010 - Compendium of Methods for the Determination of Air Pollutants in Indoor Air.
- C. EPA 600-4-790-20 - Methods for Chemical Analysis of Water and Wastes.
- D. EPA 625/1-86/021 - Design Manual: Municipal Wastewater Disinfection.
- E. EPA 625/R-96/010b - Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air.
- F. EPA 712-C-02-190 - Health Effects Test Guidelines OPPTS 870.1100 Acute Oral Toxicity.

3.04 FDA -- FOOD AND DRUG ADMINISTRATION

- A. FDA Food Code - Chapter 6 - Physical Facilities.

3.05 FEMA -- U.S. FEDERAL EMERGENCY MANAGEMENT AGENCY

- A. FEMA (MAPS) - FEMA Map Service Center.
- B. FEMA 412 - Installing Seismic Restraints for Mechanical Equipment.
- C. FEMA 413 - Installing Seismic Restraints for Electrical Equipment.
- D. FEMA 414 - Installing Seismic Restraints for Duct and Pipe.
- E. FEMA E-74 - Reducing the Risks of Nonstructural Earthquake Damage.

3.06 FS -- FEDERAL SPECIFICATIONS AND STANDARDS (GENERAL SERVICES ADMINISTRATION)

- A. FED-STD-595C - Colors Used in Government Procurement (Fan Deck).
- B. FS L-F-001641 - Floor Covering Translucent or Transparent Vinyl Surface with Backing; 1971, and Amendment 2, 1982.
- C. FS L-S-125 - Screening, Insect, Nonmetallic.
- D. FS RR-P-1352 - Partitions, Toilet, Complete; Revision C, 1989.
- E. FS RR-T-650 - Treads, Metallic and Nonmetallic, Skid Resistant.
- F. FS RR-W-365 - Wire Fabric (Insect Screening); 1980, Rev. A (Amended 1986).
- G. FS SS-T-312 - Tile, Floor: Asphalt, Rubber, Vinyl, and Vinyl Composition; Revision B, 1974, and Amendment 1, 1979.
- H. FS TT-B-1325 - Beads (Glass Spheres); Retro-Reflective.
- I. FS TT-P-115 - Paint, Traffic (Highway, White and Yellow); Revision F, 1984.
- J. FS TT-P-1952 - Paint, Traffic and Airfield Marking, Waterborne.
- K. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service.
- L. FS W-C-596 - Connector, Electrical, Power, General Specification for.
- M. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification).
- N. STATE STD 01.01 - Certification Standard Forced Entry and Ballistic Resistance of Structural Systems; Physical Security Division, Office of Physical Security Programs, Bureau of Diplomatic Security, United States Department of State.
- O. UFC 4-010-01 - DoD Minimum Antiterrorism Standards for Buildings.
- P. USPS Handbook AS-503 - Standard Design Criteria; United States Postal Service.

3.07 GSA -- U.S. GENERAL SERVICES ADMINISTRATION

- A. GSA PBS-P100 - Facilities Standards for the Public Buildings Service; General Services Administration.

3.08 NIJ -- NATIONAL INSTITUTE OF JUSTICE (DEPT. OF JUSTICE)

- A. NIJ 0108.01 - Standard for Ballistic Resistant Protective Materials.

3.09 PS -- PRODUCT STANDARDS

- A. PS 1 - Structural Plywood.
- B. PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
- C. PS 20 - American Softwood Lumber Standard.

3.10 USDA -- UNITED STATES DEPARTMENT OF AGRICULTURE

- A. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service.

3.11 USGS -- UNITED STATES GEOLOGICAL SURVEY

- A. USGS (FMWQ) - National Field Manual for the Collection of Water-Quality Data; United States Geological Survey.

END OF SECTION

SECTION 01 45 33
CODE-REQUIRED SPECIAL INSPECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Division of the State Architect (DSA) Procedures for construction oversight and inspections required during the course of construction.
- B. Code-required special inspections.
 - 1. Division of the State Architect (DSA) approved testing laboratory services and inspections required during the course of construction.
- C. Testing services incidental to special inspections.
- D. Submittals.
- E. Manufacturers' field services.
- F. Fabricators' field services.

1.02 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- B. Section 01 40 00 - Quality Requirements.
- C. Section 01 42 19 - Reference Standards.
- D. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

1.03 DEFINITIONS

- A. Code or Building Code: California Building Code and, more specifically, Chapter 17A - Structural Tests and Special Inspections, of same.
- B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located. AHJ for this Project is Division of the State Architect.
- C. Special Inspection:
 - 1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the CBC that also require special expertise to ensure compliance with the approved contract documents and the referenced standards.
 - 2. Special inspections are separate from and independent of tests and inspections conducted by District or Contractor for the purposes of quality assurance and contract administration.

1.04 REFERENCE STANDARDS

- A. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.
 - 1. Use 2014 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- B. AISC 341 - Seismic Provisions for Structural Steel Buildings.

1. Use 2016 as indicated in 2019 CBC Ch. 35 Referenced Standards.
 - C. AISC 360 - Specification for Structural Steel Buildings.
 1. Use 2016 as indicated in 2019 CBC Ch. 35 Referenced Standards.
 - D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
 1. Use 2016 with Supplements No. 1, as indicated in 2019 CBC Ch. 35 Referenced Standards.
 - E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 1. Use 2015ae1 as indicated in 2019 CBC Ch. 35 Referenced Standards.
 - F. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 1. Use 2015 as indicated in 2019 CBC Ch. 35 Referenced Standards.
 - G. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.
 - H. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 1. Use 2015 as indicated in 2019 CBC Ch. 35 Referenced Standards.
 - I. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete.
 1. Use 2014a as indicated in 2019 CBC Ch. 35 Referenced Standards.
 - J. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
 - K. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m<sup>3
 - 1. Use 2012e1 as indicated in 2019 CBC Ch. 35 Referenced Standards.</sup>
- L. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- M. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
- N. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing.
- O. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems.
 1. Use 2014b as indicated in 2019 CBC Ch. 35 Referenced Standards.
- P. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers.
 1. Use 2010a (Reapproved 2015) as indicated in 2019 CBC Ch. 35 Referenced Standards.
- Q. ASTM E2570/E2570M - Standard Test Methods for Evaluating Water-Resistive Barrier (WRB) Coatings Used under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage.
 1. Use 2007e1 (Reapproved 2014) as indicated in 2019 CBC Ch. 35 Referenced Standards.
- R. AWS D1.1/D1.1M - Structural Welding Code - Steel.
 1. Use 2015 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- S. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel.

- 1. Use 2017 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- T. SDI (QA/QC) - Standard for Quality Control and Quality Assurance for Installation of Steel Deck.
 - 1. Use 2017 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- U. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures.
 - 1. Use 2016 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- V. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
 - 1. Use 2016 as indicated in 2019 CBC Ch. 35 Referenced Standards.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency is required to:
 - 1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
 - 3. Submit certification that Special Inspection Agency is acceptable to AHJ.
- C. Testing Agency Qualifications: Prior to the start of work, the Testing Agency is required to:
 - 1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Testing and inspections will be performed by an independent testing laboratory selected and employed by the District and approved by the Division of the State Architect (DSA).
 - a. Qualification of a testing agency or laboratory will be under the jurisdiction of the DSA Structural Safety Section (SSS). Procedural and acceptance criteria are set forth in the California Administrative Code (CBC) Chapter 4.
- D. Manufacturer's Qualification Statement: Manufacturer is required to submit documentation of manufacturing capability and quality control procedures. Include documentation of AHJ approval.
- E. Fabricator's Qualification Statement: Fabricator is required to submit documentation of fabrication facilities and methods as well as quality control procedures.
- F. Distribution List: The Testing Laboratory will make the following distribution of test and inspection reports:

1. District	1
2. Architect	2
3. Structural Engineer	1
4. Contractor	1
5. District's Inspector	1
6. Division of the State Architect	1

7. Construction Manager

1

- G. Each and every test or inspection report shall bear the File Number and Application Number assigned to this project by the DSA.
- H. DSA Form 291: From the engineering manager of the laboratory of record.
- I. Special Inspection Reports: After each special inspection, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one each to the distribution list.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of Special Inspector.
 - d. Date and time of special inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of special inspection.
 - h. Date of special inspection.
 - i. Results of special inspection.
 - j. Compliance with Contract Documents.
 - 2. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.
 - 3. Comply with DSA IR 17-12, revised 04/23/20.
- J. Fabricator Special Inspection Reports: After each special inspection of fabricated items at the Fabricator's facility, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one each to the distribution list.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of Special Inspector.
 - d. Date and time of special inspection.
 - e. Identification of fabricated item and specification section.
 - f. Location in the Project.
 - g. Results of special inspection.
 - h. Verification of fabrication and quality control procedures.
 - i. Compliance with Contract Documents.
 - j. Compliance with referenced standard(s).
- K. Test Reports: After each test or inspection, promptly submit at least two copies of report; one to Architect and one each to the distribution list.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.

- d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test or inspection.
 - h. Date of test or inspection.
 - i. Results of test or inspection.
 - j. Compliance with Contract Documents.
 - k. Test reports shall be signed by a Civil Engineer licensed in the State of California.
2. Test reports shall include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory.
 - a. Samples taken but not tested shall also be reported.
 - b. Records of special sampling operations as required shall also be reported.
 - c. Reports shall show that the material or materials were sampled and tested in accordance with the requirements of the CBC, and with the approved specifications.
 - d. They shall also state definitely whether or not the material or materials tested comply with requirements.
 - e. Test reports shall be issued within 14 days of finding being known, to all parties listed above.
 3. At the completion of the project, Testing Laboratory shall certify in writing and on all required DSA forms, that all work specified or required to be tested and inspected conforms to drawings, specifications and applicable building codes.
 4. Verification of Test Reports:
 - a. The Testing Laboratory of record shall submit to the Division of the State Architect (DSA) a verified report covering all tests which are required to be made by that agency during the progress of the project.
 - 1) Such report shall be furnished each time that work on the project is suspended, covering the tests up to that time, and at the completion of the project.
 - 2) Specific testing requirements as listed on the Structural Test and Inspections (T&I) Form DSA-103 for this project. These tests may include the following forms:
 - (a) DSA-201: Soils Compaction.
 - (b) DSA-202: Sieve Analysis.
 - (c) DSA-203: Tension/Bend.
 - (d) DSA-204: Compression.
 - (e) DSA-205: Concrete Masonry Unit.
 - (f) DSA-206: Anchor Load.
 - (g) DSA-207: Masonry Core Shear/Compression.
 - (h) DSA-208: High-Strength Bolt.
 - (i) DSA-210: Ultrasonic (NDT).
 - (j) DSA-250: Special Inspection(s).
 - (k) DSA-291: Laboratory Verified Report.
 - (l) DSA-292: Special Inspection(s) Verified Report(s).
 - (m) DSA-293: Geotechnical Verified Report.

- (n) DSA-403: Energy Compliance Checklist.
- 3) Other Division of the State Architect (DSA) Certification Documents (Reports) as may be required.
- b. DSA Form 292 - Special Inspection Verified Report shall be from all special inspectors contracting directly and individually with the school board.
- L. Certificates: When specified in individual special inspection requirements, Special Inspector shall submit certification by the manufacturer, fabricator, and installation subcontractor to Architect and AHJ, in quantities specified for Product Data.
 - 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect and AHJ.
- M. Manufacturer's Field Reports: Submit reports to Architect.
 - 1. Submit report in duplicate within 7 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.
- N. Fabricator's Field Reports: Submit reports to Architect and AHJ.
 - 1. Submit report in duplicate within 30 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.

1.06 SPECIAL INSPECTION AGENCY

- A. District will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling in accordance with ASTM E329 and required by the building code.
- B. The Special Inspection Agency may employ and pay for services of an independent testing agency to perform testing and sampling associated with special inspections and required by the building code.
- C. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.07 TESTING AND INSPECTION AGENCIES

- A. District is to employ services of an independent inspection and testing agency to perform observation, testing and sampling associated with special inspections including those not required by the building code. CAC
 - 1. Project Inspector and testing lab are employed by the District and approved by:
 - a. A/E of Record.
 - b. Structural Engineer (when applicable).
 - c. DSA.
- B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.08 QUALITY ASSURANCE

- A. Special Inspection Agency Qualifications:
 - 1. Independent firm specializing in performing testing and inspections of the type specified in this section.
- B. Testing Agency Qualifications:
 - 1. Independent firm specializing in performing testing and inspections of the type specified in this section.
- C. Testing and inspection services which are performed shall be in accordance with requirements of the CBC, and as specified herein. Testing and inspection services shall verify that work meets the requirements of the Construction Documents.
- D. In general, tests and inspections for structural materials shall include all items enumerated on the Structural Tests and Inspections list for this project as prepared and distributed by the Architect.
- E. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document.

1.09 INSPECTION BY THE DISTRICT

- A. The District shall have the right to reject materials and workmanship which are defective, or to require their correction.
 - 1. Rejected workmanship shall be satisfactorily corrected and rejected materials shall be removed from the premises without charge to the District.
 - 2. If the Contractor does not correct such rejected work within a reasonable time, the District may correct such rejected work and charge the expense to the Contractor.
- B. Should it be considered necessary or advisable by the District at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out the completed work; the Contractor shall on request promptly furnish necessary facilities, labor and materials.
 - 1. If such work is found to be defective in any respect due to fault of the Contractor or his subcontractor, he shall defray all expenses of such examinations and of satisfactory reconstruction. .
 - 2. If, however, such work is found to meet the requirements of the Contract, the additional cost of labor and material necessarily involved in the examination and replacement shall be allowed the Contractor.

1.10 DISTRICT'S INSPECTOR

- A. A Project Inspector (IOR) employed by the District and approved by Architect, Structural Engineer and DSA in accordance with the requirements of the California Building Code will be assigned to the work.
 - 1. Project Inspector duties are specifically defined in CCR Title 24 Part 1, Sec. 4-211(b), 4-219, 4-333(b), 4-336 and 4-342.

- B. The District's Inspector shall at all times have access for the purpose of inspection to all parts of the work and to the shops where the work is in preparation, and the Contractor shall at all times maintain proper facilities and provide safe access for such inspection.
- C. The work of construction in all stages of progress shall be subject to the personal continuous observation of the District's Inspector.
 - 1. The Contractor shall furnish the Inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the work and the character of the materials.
 - 2. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this Contract.
 - 3. Inspector of Record is required to work a normal 40 hour week on this project only. Any overtime required will be at the expense of the Contractor and sub-contractor requiring the inspection.

1.11 PAYMENTS

- A. Costs of initial testing and inspection, except as specifically modified herein, or specified otherwise in technical sections, will be paid for by the District, providing such testing and inspection indicates compliance with Contract Documents. Initial tests and inspections are defined as the first tests and inspections as herein specified.
- B. In the event a test or inspection indicates failure of a material or procedure to meet requirements of Contract Documents, costs for retesting and reinspection will be paid by the District and backcharged to the Contractor.
- C. Additional tests and inspections not herein specified but requested by District or Architect, will be paid for by District, unless results of such tests and inspections are found to be not in compliance with Contract Documents, in which case the District will pay all costs for initial testing as well as retesting and reinspection and backcharge the Contractor.
- D. Costs for additional tests or inspections required because of change in materials being provided or change of source or supply will be paid by District and backcharged to the Contractor.
- E. Costs for tests or inspections which are required to correct deficiencies will be paid by the District and backcharged to the Contractor.
- F. Cost of testing which is required solely for the convenience of Contractor in his scheduling and performance of work will be paid by the District and backcharged to the Contractor.
- G. Overtime costs for testing and inspections performed outside the regular work day hours, including weekends and holidays, will be paid for by the District and backcharged to the Contractor. Such costs include overtime costs for the District's Inspector.
- H. Testing Laboratory shall separate and identify on the invoices, the costs covering all testing and inspections which are to be backcharged to the Contractor as specified above.
- I. Testing Laboratory shall furnish to District a cost estimate breakdown covering initial tests and inspections required by Contract Documents. Estimate shall include number of tests, man-hours required for tests, field and plant inspections, travel time, and costs.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SCHEDULE OF SPECIAL INSPECTIONS, GENERAL

- A. Frequency of Special Inspections: Special Inspections are indicated as continuous or periodic.
 - 1. Continuous Special Inspection: Special Inspection Agency is required to be present in the area where the work is being performed and observe the work at all times the work is in progress.
 - 2. Periodic Special Inspection: Special Inspection Agency is required to be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.
- B. Tests and inspections for the following will be required in accordance with the current CBC, unless otherwise specified.

3.02 SPECIAL INSPECTIONS FOR STEEL CONSTRUCTION (CHAPTER 17A AND 22A)

- A. Structural Steel: Comply with quality assurance inspection requirements of CBC.
- B. Cold-Formed Steel Deck: Comply with quality assurance inspection requirements of SDI (QA/QC).
- C. Erection Inspection: Testing Laboratory will visually inspect bolted and field welded connections, perform such additional tests and inspections of field work as are required by the Architect and prepare test reports for the Architect's review.
- D. Inspect High Strength Bolt Installation per CBC 1705A.2.1, Table 1705A.2.1.
 - 1. Special inspection for high tension bolting will be provided by the Testing Laboratory. Inspection shall be in accordance with RCSC Specification for Structural Joints Using High Strength Bolts, 2014.
 - 2. Comply with DSA Interpretations:
 - a. IR 17-8: Sampling and Testing of High Strength Bolts, Nuts, and Washers 2019 CBC; Revised 09/24/19.
 - b. IR 17-9: High-Strength Structural Bolting Inspection: 2019 CBC; Revised 09/24/19.
- E. Welding:
 - 1. Testing Laboratory will review welding procedure specifications as prepared by the fabricator.
 - 2. Structural Steel:
 - a. Inspect welding per CBC 1705A.2.5.
 - 1) Comply with DSA IR 17-3: Structural Welding Inspection: 2019 CBC; Revised 09/24/19.
 - b. Complete and Partial Joint Penetration Groove Welds: Verify compliance with AWS D1.1/D1.1M and AWS D1.8/D1.8M; continuous.
 - 3. Reinforcing Steel: Verify items listed below comply with AWS D1.4/D1.4M and ACI 318, Section 26.6.

- a. Provide continuous inspection of welding of reinforcing steel per CBC 1705A.3.1; Table 1705A.3, Item 2; 1903A.8.
- 4. Ultrasonic Testing: All full penetration multi-pass groove welds shall be subject to ultrasonic testing.
 - a. Defective welds shall be repaired and retested with ultrasonic equipment.
 - b. Initially, all multi-pass groove field welds shall be tested at the rate of 100 percent of each individual welder.
 - 1) If rejectable defects occur in less than 5 percent of the welds tested, the frequency of testing may be reduced to 25 percent.
 - 2) If the rate of rejectable defects increases to 5 percent or more, 100 percent testing shall be reestablished until the rate is reduced to less than 5 percent.
 - 3) The percentage of rejects shall be calculated for each welder independently.
 - c. When ultrasonic indications arising from the weld root can be interpreted as either a weld defect or the backing strip itself, the backing strip shall be removed at the expense of the Contractor, and if no root defect is visible, the weld shall be retested.
 - 1) If no defect is indicated on this retest, and no significant amount of the base and weld metal have been removed, no further repair or welding is necessary.
 - 2) If a defect is indicated, it shall be repaired at the Contractor's expense.
- 5. Technician to calibrate ultrasonic instrumentation to evaluate the quality of the welds in accordance with AWS D1.1/D1.1M latest Edition.
- 6. Should defects appear in welds tested, repairs shall be similarly inspected at the Contractor's expense and at the direction of the Architect until satisfactory performance is assured.
- 7. Other methods of inspection, for example, X-ray, gamma ray, magnetic particle, or dye penetrant, may be used on welds if felt necessary by the Architect.
- F. Corrections:
 - 1. Correct deficiencies in structural steel work which inspections and test reports indicate to be not in compliance with the specified requirements.
 - 2. Perform additional tests required to reconfirm noncompliance of the original work and to show compliance of corrected work. Costs for all additional tests will be paid for by the District and backcharged to the Contractor.

3.03 SPECIAL INSPECTIONS FOR CONCRETE CONSTRUCTION (CHAPTER 17A AND 19A)

- A. Inspection:
 - 1. Job Site Inspection: CBC 1705A.3, 1705A.3.5 (Conc. Preplacement), 1705A.3.6 (Placing Record), and 1910A.
 - 2. Batch Plant or Weighmaster Inspection: CBC 1705A.3.3.
- B. Reinforcing Steel, Including: Verify compliance with approved contract documents and ACI 318, Sections 20.2, 25.2 through 25.7, and 26.6.
 - 1. Reinforcing Bars: CBC 1901A.6; 1910A.2.
 - 2. Tests:

- a. Tests shall be performed before the delivery of steel to Project site. Steel not meeting specifications shall not be shipped to the Project.
 - b. Testing procedure shall conform to ASTM A615/A615M or .
 - c. Sample at the place of distribution, before shipment:
 - 1) Make one tensile test and one bending test from samples out of 10 tons, or fraction thereof, of each size and kind of reinforcing steel, where taken from bundles as delivered from the mill and properly identified as to heat number.
 - 2) Mill analysis shall accompany report.
 - 3) Where identification number cannot be ascertained, or where random samples are taken, make one series of tests from each 2-1/2 tons, or fraction thereof, of each size and kind of reinforcing steel.
 - 4) Tests on unidentified reinforcing steel will be paid by the District and backcharged to the Contractor.
 - 5) Samples shall include not fewer than 2 pieces, each 18 inches long, of each size and kind of reinforcing steel.
 - d. District's Inspector will inspect all reinforcement for concrete work for size, dimensions, locations and proper placement.
- C. Reinforcing Bar Welding: Verify compliance with AWS D1.4/D1.4M and ACI 318, 26.6.4; continuous.
- 1. Verify weldability of reinforcing bars other than those complying with ASTM A706/A706M; periodic.
 - 2. Inspect single-pass fillet welds, maximum 5/16 inch; periodic.
 - 3. Inspect all other welds; continuous.
 - 4. Reinforcing Bar Welding Inspection: CBC 1705A.3.1; Table 1705A.3, Item 2; 1903A.8.
- D. Anchors Cast in Concrete: Verify compliance with ACI 318, 17.8.2; periodic.
- E. Anchors Post-Installed in Hardened Concrete: Verify compliance with ACI 318.
- 1. Comply with CBC Section 1910A.5; Table 1705A.3, items 4a & 4b, ASCE 7, Section 13.4.
 - 2. Adhesive Anchors: Verify horizontally or upwardly-inclined orientation installations resisting sustained tension loads - Section 17.8.2.4; continuous.
 - 3. Other Mechanical and Adhesive Anchors: Verify as per Chapter 17.8.2; periodic.
- F. Anchors Installed in Hardened Concrete: Verify compliance with ACI 318; periodic.
- G. Design Mix: Verify plastic concrete complies with the design mix in approved contract documents and with CBC Chapter 19A, ACI 318, Sections 26.4.3, 26.4.4; periodic.
- H. Concrete Sampling Concurrent with Strength Test Sampling: Each time fresh concrete is sampled for strength tests, verify compliance with ASTM C172/C172M, ASTM C31/C31M and ACI 318, Chapter 26.5, 26.12, and record the following, continuous:
- 1. Slump.
 - 2. Air content.
 - 3. Temperature of concrete.
 - 4. Strength Tests of Concrete: CBC 1905A.1.15; Table 1705A.3 Item 6; ACI 318-14 Sec. 26.12.

- I. Concrete Placement: Verify application techniques comply with approved Contract Documents and ACI 318, Chapter 26.5; continuous.
- J. Specified Curing Temperature and Techniques: Verify compliance with ACI 318, Chapter 26.5.3-26.5.5; continuous.
- K. Concrete Strength in Situ: Verify concrete strength complies with approved Contract Documents, CBC Table 1705A.3, and modified ACI 318, Chapter 26.12.2,1(a).
- L. Formwork Shape, Location and Dimensions: Verify compliance with approved Contract Documents and ACI 318, Chapter 26.11.1.2(b); continuous.
- M. Welding of Reinforcing Bars: Conduct special inspections and verify Special Inspector's qualifications in accordance with requirements of AWS D1.4/D1.4M.
- N. District Inspector (IOR) will do the following:
 - 1. Inspect placing of reinforcing steel and concrete at Project.
 - 2. Obtain weighmaster's certificate and identify mix before accepting each load.
 - 3. Keep daily record of concrete placement, identifying each truck load, time of receipt, and location of concrete in structure.
 - 4. Keep record until completion of Project and make available for inspection by DSA Field Engineer or representative.
 - 5. During progress of work, take an additional number of test cylinders as directed by Architect. Conform to CBC 1905A.1.15 (modified ACI 318). Test cylinders need not be made for concrete used in exterior flatwork.
 - a. ACI 318 Section 26.12.2.1 shall be replaced and the Contractor shall comply with the following:
 - 1) Samples for strength test of each class of concrete placed each day shall not be taken less than once for each 50 cubic yards (38.3m³) of concrete, or not less than once for each 2,000 square feet (186 m²) of surface area of for slabs or walls.
 - 2) Additional samples for seven day compressive strength tests shall be taken for each class of concrete at the beginning of the concrete work or whenever the mix or aggregate is changed.
 - 6. One set of cylinders shall consist of 4 samples all taken from same batch, one to be tested at age of 7 days and two at 28 days.
 - 7. Make and store cylinders according to ASTM C31/C31M.
 - 8. Deliver cylinders to laboratory or store cylinders in a suitable protected environment for pick up by laboratory personnel.
 - 9. Make slump test of wet concrete according to test for slump of portland cement concrete, ASTM C143/C143M, at least at the same frequency that the cylinders are taken.

3.04 SPECIAL INSPECTIONS FOR MASONRY CONSTRUCTION (CHAPTER 17A AND 21A)

- A. Masonry Structures Subject to Special Inspection:
 - 1. Masonry construction when required by the quality assurance program of TMS 402/602.

2. Engineered masonry in structures classified as "low hazard..." and "substantial hazard to human life in the event of failure".
- B. Verify each item below complies with approved Contract Documents and the applicable articles of TMS 402/602.
1. Materials:
 - a. Masonry Units CBC 2103A.1
 - b. Mortar, Portland Cement CBC 2103A.2
 - c. Mortar and Grout Aggregates CBC 2103A.2; 2103A.3
 - d. Reinforcing Bars CBC 2103A.4
 2. Masonry Quality:
 - a. Portland Cement Tests CBC 1903A, 1910A.1
 - b. Mortar and Grout Tests CBC 2105A.3
 - c. Masonry Core Tests CBC 2105A.4
 - d. Masonry Unit Tests CBC 2105A.2, 2105A.3, 1705A.4
 - e. Reinforcing Bar Tests CBC 1910A.2
 3. Masonry Inspection:
 - a. Reinforced Masonry CBC 1705A.4; TMS 402 Table 3.1.3 level C.
 - b. Reinforcing Bar Welding Inspection CBC 1705A.3.1; Table 1705A.3, Item 2; Table 1705A.3, Item 2; 1903A.8.
 - c. Post Installed Anchors in Masonry CBC 1616A.1.19; 1705A.4, Table 1705A.3, Items 4a & 4b; 1910A.5.
 4. Veneer (Chapter 14):
 - a. Materials:
 - 1) Masonry Units CBC 2103A.2.4
 - 2) Mortar CBC 2103A.2
 - 3) Grout CBC 2103A.3
 - b. Veneer Quality:
 - 1) Adhered Veneer - Bond Strength & Tests CBC 1405.10
 - c. Anchorage above exits or more than 20 feet above adjacent ground; CBC 1411.2.
 5. Inspections and Approvals:
 - a. Verify compliance with the required inspection provisions of the approved Contract Documents; periodic.
 - b. Verify approval of submittals required by Contract Documents; periodic.
 6. Compressive Strength of Masonry: Verify compressive strength of masonry units prior to start of construction unless specifically exempted by code; periodic.
 - a. Comply with CBC 2105A.2 Compressive Strength.
 7. Slump Flow and Visual Stability Index (VSI): Verify compliance as self consolidating grout arrives on site; continuous.
 8. Joints and Accessories: When masonry construction begins, verify:
 - a. Proportions of site prepared mortar; periodic.
 - b. Construction of mortar joints; periodic.

- c. Location of reinforcement, connectors, prestressing tendons, anchorages, etc; periodic.
- 9. Structural Elements, Joints, Anchors, Protection: During masonry construction, verify:
 - a. Size and location of structural elements; periodic.
 - b. Type, size and location of anchors, including anchorage of masonry to structural members, frames or other construction; periodic.
 - c. Size, grade and type of reinforcement, anchor bolts and prestressing tendons and anchorages; periodic.
 - d. Welding of reinforcing bars; continuous.
 - e. Preparation, construction and protection of masonry against hot weather above 90 degrees F and cold weather below 40 degrees F; periodic.
- 10. Grouting Preparation: Prior to grouting, verify:
 - a. Comply with CBC 2105A.2 Compressive Strength.
 - b. Grout space is clean; periodic.
 - c. Correct placement of reinforcing, connectors, prestressing tendons and anchorages; periodic.
 - d. Correctly proportioned site prepared grouts and prestressing grout for bonded tendons; periodic.
 - e. Correctly constructed mortar joints; periodic.
- 11. Preparation of Grout Specimens, Mortar Specimens and Prisms: Observe preparation of specimens; periodic.
 - a. Comply with CBC 2105A.2 Compressive Strength.

3.05 SPECIAL INSPECTIONS FOR SITE-BUILT WOOD CONSTRUCTION

- A. Conform to CBC 1705A.5.3 Wood Structural Elements and Assemblies.

3.06 SPECIAL INSPECTIONS FOR SOILS

- A. Materials and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
 - 1. Design bearing capacity of material below shallow foundations; periodic.
 - 2. Design depth of excavations and suitability of material at bottom of excavations; periodic.
 - 3. Materials, densities, lift thicknesses; placement and compaction of backfill: continuous.
 - 4. Subgrade, prior to placement of compacted fill verify proper preparation; periodic.
- B. Testing: Classify and test excavated material; periodic.
- C. Excavations, Foundations and Retaining Walls (Chapters 17A, 18A, and 33):
 - 1. Earth Compaction: CBC 1705A.6; Table 1705A.6, continuous; 1804A.6.
 - 2. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of compacted fill: CBC 1705A.6.1; Table 1705A.6, periodic; 1804A.6.
- D. The Geotechnical Engineer of record or a Geotechnical Engineer selected by the District will provide continuous inspection of fill and will field test fill and earth backfill as placed and compacted, and inspect excavations and subgrade before concrete is placed and provide

periodic inspection of open excavations, embankments, and other cuts or vertical surfaces of earth.

1. The Geotechnical Engineer will submit a Verified Report indicating observations, tested fills, and opinion the fills were placed in accordance with the project specifications.
- E. Contractor shall remove unsatisfactory material, re-roll, adjust moisture, place new material, or in the case of excavations, provide proper protective measures, perform other operations necessary, as directed by the Geotechnical Engineer whose decisions and directions will be considered final.
- F. Soils Test and Inspection Procedure:
1. Allow sufficient time for testing, and evaluation of results before material is needed. The Geotechnical Engineer shall be sole and final judge of suitability of all materials.
 2. Laboratory compaction tests to be used will be in accordance with ASTM D1557.
 3. Field density tests will be made in accordance with ASTM D1556/D1556M.
 4. Number of tests will be determined by Geotechnical Engineer. Materials in question may not be used pending test results.
 5. Excavation and embankment inspection procedure. Geotechnical Engineer will visually or otherwise examine such areas for bearing values, cleanliness and suitability.
 6. Earthwork Test Reports: In order to avoid misinterpretations by the reviewing agencies, all retest results shall be reported on the same sheet, immediately following the previous failure test to which it is related. Retests shall be clearly noted as such.

3.07 SPECIAL INSPECTIONS FOR FIRE RESISTANT PENETRATIONS AND JOINTS

- A. Verify penetration firestops in accordance with ASTM E2174.
- B. Verify fire resistant joints in accordance with ASTM E2393.
- C. Inspection: Comply with CBC 1705A.17.

3.08 SPECIAL INSPECTIONS FOR FIRE DOOR ASSEMBLIES

- A. Per NFPA 80 5.2.1:
 1. Provide a third party inspector not associated with the construction, supply or installation of this project to develop a field survey of the doors and hardware.
 2. Survey is to be done by a member certified as a FDAI (Fire Door Assembly Inspector), Certified AHC (Architectural Hardware Consultant) or a certified testing laboratory: UL or Intertek.
 3. Certified Inspectors may be found at DHI.org, Intertek, or CAFDI.org.

3.09 SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE

- A. Inspection: Comply with CBC 1705A.12.
- B. Testing: Comply with CBC 1705A.13.
- C. Structural Steel: Comply with the quality assurance plan requirements of AISC 341.
- D. Structural Wood:
 1. Field gluing; continuous.

2. Nailing, bolting, anchoring and other fastening of components within the seismic force-resisting system; periodic.
- E. Cold Formed Steel Light Frame Construction:
1. Field welding; periodic.
 2. Screw attachment, bolting, anchoring and other fastening of components within the main seismic force-resisting system; periodic.
- F. Storage Racks and Access Floors: Anchorage; periodic.
- G. Architectural Components: Erection and fastening of components below; periodic.
1. Exterior cladding; per ICC ESR Report when applicable.
 2. Interior and exterior veneer.
 3. Interior and exterior non-loadbearing walls and partitions.
 4. Suspended ceiling systems and their anchorage, per ICC ESR Report. CBC Section 1705A.12.5 and 1705A.13.2.
- H. Mechanical and Electrical Components:
1. Anchorage of electric equipment required for emergency or standby power systems; periodic.
 2. Installation and anchorage of other electrical equipment; periodic.
 3. Vibration isolation systems where the approved Contract Documents require a nominal clearance of 1/4 inch or less between support frame and seismic restraint; periodic.
 4. Installation of mechanical and electrical equipment, including duct work, piping systems and their structural supports, where automatic fire sprinkler systems are installed.
 - a. Verify clearances have been provide as required by Section 13.2.3 of ASCE 7.
 - b. Verify nominal clearance of 3 inches has been provided between fire protection sprinkler drops and sprigs and: structural members not used collectively or independently to support the sprinklers; equipment attached to the building structure; and other systems' piping.
- I. Designated Seismic System Verification: Verify label, anchorage or mounting complies with certificate of compliance provided by manufacturer or fabricator.
- J. Structural Testing for Seismic Resistance:
1. Concrete reinforcement: Comply with ACI 318, Section 20.2.2.5 and 21.1.5.2.
 - a. Materials Obtain mill certificates demonstrating compliance with ASTM A615/A615M; periodic.
 - b. Welding: Perform chemical tests complying with ACI 318, Section 26.6.4 to determine weldability; periodic.
 2. Structural Steel: Comply with the quality assurance requirements of AISC 341.
 3. Non-Structural Components:
 - a. General Design Requirements: Obtain manufacturer certification of compliance with requirements of ASCE 7, Section 13.2.1; periodic.
 - b. Designated Seismic Force-Resisting Non-Structural System Components: Obtain manufacturer certification of compliance with ASCE 7, Section 13.2.2; periodic.

- K. Structural Observations for Seismic Resistance: Visually observe structural system for general compliance with the approved Contract Documents; periodic.

3.10 SPECIAL INSPECTIONS FOR WIND RESISTANCE

- A. Structural Wood:
 - 1. Field gluing of components in the main wind force-resisting system; continuous.
 - 2. Nailing, bolting, anchoring and other fastening of components within the main wind force-resisting system; periodic.
- B. Cold-Formed Steel Light Frame Construction:
 - 1. Field welding; periodic.
 - 2. Screw attachment, bolting, anchoring and other fastening of components within the main wind force-resisting system; periodic
- C. Wind Resisting Components:
 - 1. Roof covering, roof deck, and floor framing connections; periodic.
 - 2. Exterior wall covering and wall connections to roof and floor diaphragms and framing; periodic.
- D. Structural Observations for Wind Resistance: Visually observe structural system for general compliance with the approved Contract Documents; periodic.

3.11 STRUCTURAL OBSERVATIONS FOR STRUCTURES

- A. Provide Observations: For structure where one or more of the following conditions exist:
 - 1. Such observation is required by the registered design professional responsible for the structural design.
 - 2. Such observation is specifically required by AHJ.

3.12 SPECIAL ARCHITECTURAL INSPECTIONS

- A. Signs and/or identification devices:
 - 1. Prior to issuance of a final Certificate of Occupancy, Enforcing Agency shall verify installation of signs for information content, appearance, location and Braille per CBC 11B-703.1.1.2.
 - a. Inspection shall include, but not limited to:
 - 1) Braille dots and cells are properly spaced and the size proportion and type raised characters are in compliance with these regulations.
 - 2) Tactile exit signage per CBC 1013.4 and 11B-216.4.1 Exit doors.
 - 3) Tactile floor designation signs in stairways per CBC 1023.9 Stairway identification signs.
 - 4) Tactile special egress control device signs per CBC 1010.1.9.7 Delayed Egress Locks, item 5.1.
 - 5) Elevator car control identification per CBC 11B-407.4.6-8 Elevator car controls.
 - 6) Sanitary facilities signage per CBC 11B-216.8 Toilet rooms and bathing rooms; and 11B-703.7.2.6 Toilet and bathing facilities geometric symbols.
- B. Water-resistive barrier coating:

1. Installation over sheathing substrate per ASTM E2570/E2570M.
- C. Glass and glazing identification:
 1. Verify installation of manufacturer's material mark inspection per CBC 2403.1.
 - a. Safety glazing shall be labeled per CBC 2406.3.
- D. Waterproofing Verification:
 1. The District's Inspector will check surfaces and approve before application of membrane materials and verify that substrate surfaces are in satisfactory condition to receive membrane materials and furnish continuous inspection during application of membrane.
 2. Check minimum specified thickness of membrane waterproofing. For fluid-applied membrane check thickness every 100 square feet during application with a mil-thickness gage especially manufactured for the purpose.
- E. Inspection by Health Department:
 1. CONSTRUCTION INSPECTIONS: Contact the Health Department Plan Checker for a Preliminary Inspection when construction is approximately 80% complete, with plumbing, rough ventilation, and rough equipment installed. Request for inspection should be made at least five (5) working days in advance.
 2. A FINAL INSPECTION MUST be made upon completion of ALL work including finished details. APPROVAL to operate shall not be granted, or remodeled areas approved to operate, until the facility has passed the FINAL INSPECTION, and "APPLICATION TO OPERATE" has been completed and PERMIT FEES have been paid.

3.13 SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

- A. Special Inspection Agency shall:
 1. Verify samples submitted by Contractor comply with the referenced standards and the approved Contract Documents.
 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 3. Perform specified sampling and testing of products in accordance with specified reference standards.
 4. Ascertain compliance of materials and products with requirements of Contract Documents.
 5. Promptly notify Architect, SEOR, IOR, DSA, District and Contractor of observed irregularities or non-conformance of work or products.
 6. Perform additional tests and inspections required by Architect.
 7. Submit reports of all tests or inspections specified.
- B. Limits on Special Inspection Agency Authority:
 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the work.
 3. Agency may not assume any duties of Contractor.
 4. Agency has no authority to stop the work.

- C. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- D. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.14 TESTING AGENCY DUTIES AND RESPONSIBILITIES

- A. Testing Agency Duties:
 - 1. Test samples submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
 - 6. Perform additional tests and inspections required by Architect.
 - 7. Attend preconstruction meetings and progress meetings.
 - 8. Submit reports of all tests or inspections specified.
- B. Limits on Testing or Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the work.
- C. Immediately upon determination of a test failure, the Laboratory shall telephone the results to the Architect. On the same day, Laboratory shall send test results by email to the Architect and to all relevant responsible parties of the project team, and District's Inspector
- D. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.
- E. Contractor will pay for re-testing required because of non-compliance with specified requirements.
- F. At the completion of the project, Testing Laboratory shall certify in writing and on all required DSA forms, that all work specified or required to be tested and inspected conforms to drawings, specifications and applicable building codes.
 - 1. See DSA Procedure PR 13-01.
- G. Duties of the Laboratory of Record related to the use of form DSA 152 are as follows:
 - 1. Meet with the Project Inspector, design professionals, and contractor as needed to mutually communicate and understand the testing and inspection program and the methods of communication appropriate for the project.

2. Obtain a copy of the DSA approved construction documents from the design professional in general responsible charge prior to the commencement of construction
3. Obtain a copy of the DSA approved Statement of Structural Tests and Special Inspections (form DSA 103) from the design professional in general responsible charge prior to the commencement of construction.
4. Report all project related activities to the Project Inspector. The Project Inspector is responsible for monitoring the work of the Laboratory of Record and Special Inspectors to ensure the testing and special inspection program is satisfactorily completed
5. Provide material testing as identified in the DSA approved construction documents.
6. Submit test reports to the Project Inspector on the day the tests were performed for any tests performed on-site
7. Submit material test reports in a timely manner such that construction is not delayed and not to exceed 14 days from the date the material tests were performed. Test reports are to be submitted to DSA, the Architect, structural engineer, Project Inspector and school district.
 - a. As a convenience, and if agreed upon by involved parties, the test reports may be submitted electronically as identified in Section 4 of this procedure.
8. Immediately submit reports of material tests not conforming to the requirements of the DSA approved construction documents. These reports shall be submitted to the DSA, Architect, structural engineer, Project Inspector and school district.
9. The Engineering Manager shall submit an interim Laboratory of Record Verified Report (form DSA 291) and the Geotechnical Engineer shall submit an interim Geotechnical Verified Report (form DSA 293) to DSA, the project inspector, school district and the Design Professional in General Responsible Charge.
 - a. The reports are required to be submitted upon any of the following events occurring:
 - 1) Within 14 days of the completion of the material testing/special inspection program.
 - 2) Work on the project is suspended for a period of more than one month.
 - 3) The services of the laboratory of record are terminated for any reason prior to completion of the project.
 - 4) The DSA requests a Verified Report. (See interim verified reports below. This is a "DSA request.")
10. The Engineering Manager shall submit an interim verified report (form DSA 291) and the Geotechnical Engineer shall submit form DSA 293 to DSA and a copy to the project inspector for each of the applicable sections of the form DSA 152, prior to the project inspector signing off that section of the project inspection card, if that section required material testing. The sections are:
 - a. Initial Site Work
 - b. Foundation Prep
 - c. Vertical Framing
 - d. Horizontal Framing
 - e. Appurtenances

- f. Finish Site Work
 - g. Other Work
 - h. Final
- H. Duties of Special Inspectors, employed by the Laboratory of Record, related to the use of form DSA 152 are as follows:
1. Meet with the Project Inspector, design professionals, and contractor as needed to mutually communicate and understand the testing and inspection program and the methods of communication appropriate for the project.
 2. Report all project related activities to the Project Inspector. The Project Inspector is responsible for monitoring the work of the Laboratory of Record and Special Inspectors to ensure the testing and special inspection program is satisfactorily completed.
 3. Perform work under the supervision of the Engineering Manager for the Laboratory of Record
 4. Perform inspections in conformance with the DSA approved construction documents, applicable codes and code reference standards
 5. Prepare detailed daily inspection reports outlining the work inspected and provide the Project Inspector a copy of the reports on the same day the inspections were performed.
 6. Prepare detailed daily inspection reports outlining the work inspected and provide the Project Inspector a copy of the reports on the same day the inspections were performed.
 7. Immediately submit reports of materials or work not conforming to the requirements of the DSA approved construction documents. These reports shall be submitted to the DSA, Architect, structural engineer, Project Inspector and school district.
 8. Submit daily special inspection reports in a timely manner such that construction is not delayed and not to exceed 14 days from the date the special inspections were performed. The reports are to be submitted to the Architect, structural engineer, Project Inspector and school district.
 9. Submit Verified Report forms DSA 292 to the DSA, Project Inspector, district and design professional in responsible charge.
 10. The reports are required to be submitted upon any of the following events occurring:
 11. Within 14 days of the completion of the special inspection work.
 12. Work on the project is suspended for a period of more than one month.
 13. The services of the special inspector are terminated for any reason prior to completion of the project.
 14. The DSA requests a Verified Report. (See interim verified reports below. This is a “DSA request”)
 15. Submit an interim Verified Report (form DSA 292) to the DSA and a copy to the Project Inspector for each of the applicable sections of the form DSA 152, prior to the Project Inspector signing off that section of the project inspection card, if that section required special inspections. The sections are:
 - a. Initial Site Work
 - b. Foundation
 - c. Vertical Framing

- d. Horizontal Framing
 - e. Appurtenances
 - f. Non-Building Site Structures
 - g. Finish Site Work
 - h. Other Work
 - i. Final
16. The Verified Reports shall be sent electronically to the DSA.
- I. Duties of Special Inspectors, not employed by the Laboratory of Record, related to the use of form DSA 152 are as follows:
1. Meet with the project inspector, Laboratory of Record, the design professionals, and the contractors as needed to mutually communicate and understand the testing and inspection program, and the methods of communication appropriate for the project.
 2. Report all project related activities to the project inspector. The project inspector is responsible for monitoring the work of the Laboratory of Record and special inspectors to ensure the testing and special inspection program is satisfactorily completed.
 3. Perform work under the direction of the design professional in general responsible charge, as defined in Section 4-335(f)1B of the California Administrative Code (Title 24, Part 1).
 4. Perform inspections in conformance with the DSA approved construction documents, applicable codes and code reference standards.
 5. Prepare detailed daily inspection reports outlining the work inspected and provide the project inspector a copy of the reports on the same day the inspections were performed.
 6. Immediately submit reports of materials or work not conforming to the requirements of the DSA approved construction documents. These reports shall be submitted to DSA, the Architect, structural engineer, project inspector and the school district.
 7. Submit daily special inspection reports in a timely manner such that construction is not delayed and not to exceed 14 days from the date the special inspections were performed. The reports are to be submitted to DSA, the Architect, structural engineer, project inspector and the school district.
 8. Submit Special Inspection Verified Report forms DSA 292 to DSA, the project inspector, the school district and the Design Professional in General Responsible Charge.
 - a. The reports are required to be submitted upon any of the following events occurring:
 - 1) Within 14 days of the completion of the special inspection work.
 - 2) Work on the project is suspended for a period of more than one month.
 - 3) The services of the special inspector are terminated for any reason prior to completion of the project.
 - 4) DSA requests a verified report. (See interim verified reports below. This is a "DSA request.")
 9. Submit an interim Special Inspection Verified Report (form DSA 292) to DSA and a copy to the project inspector for each of the applicable sections of the form DSA 152, prior to the project inspector signing off that section of the project inspection card, if that section required special inspections.

- a. The sections are:
 - 1) Initial Site Work
 - 2) Foundation Prep
 - 3) Vertical Framing
 - 4) Horizontal Framing
 - 5) Appurtenances
 - 6) Finish Site Work
 - 7) Other Work
 - 8) Final

3.15 CONTRACTOR DUTIES AND RESPONSIBILITIES

A. DSA Requirements:

1. Each Multi-Prime Contractor or Subcontractor shall comply with DSA Construction Oversight Procedure PR 13-01. California Code of Regulations (CCR), Title 24, Part 1, CCR, Chapter 4, Article 1 (Sections 4-211 through 4-220) and Group1, Articles 5 and 6 (Sections 4-331 through 4-344) which provide regulations governing the construction process for projects under the jurisdiction of the Division of the State Architect (DSA).
 - a. Assist the Project Inspector (IOR) and complete and fill out the following forms during the course of construction.
 - 1) Form-102-IC: Construction Start Notice/ Inspection Card Request: Verify Project Inspector has an active form issued by DSA.
 - 2) Form-151: Project Inspector Notifications: Contractor to notify IOR and assist.
 - 3) Form-152: Project Inspection Card: See below.
 - 4) Form-154: Notice of Deviations/ Resolution of Deviations: Contractor to verify all deviations are reviewed, corrected, and accepted by the design professional, and filed with DSA through the Project Inspector (IOR).
 - (a) When the Project Inspector identifies deviations from the DSA approved construction documents the inspector must verbally notify the contractor. If the deviations are not corrected within a reasonable time frame, the inspector is required to promptly issue a written notice of deviation to the contractor, with a copy sent to the design professional in general responsible charge and the DSA.
 - (b) When the noticed deviations are corrected, the inspector is required to promptly issue a written notice of resolution to the contractor, with a copy sent to the design professional in general responsible charge and the DSA.
 - (c) Deviations include both construction deviations and material deficiencies.
 - (d) The written notice of deviations shall be made using form DSA 154.
 - (e) The notice of resolution of deviations shall be made using the original form DSA 154 that reported the deviations.
 - 5) Form-156: Commencement/Completion of Work Notification
 - 6) Form-6.C: Verified Report – Contractor: From each contractor having a contract with the school board.
2. Duties of Contractor related to the use of form DSA 152 are as follows:
 - a. The Contractor shall carefully study the DSA approved documents and shall plan a schedule of operations well ahead of time.

- b. If at any time it is discovered that work is being done which is not in accordance with the DSA approved construction documents, the Contractor shall correct the work immediately.
- c. Verify that forms DSA 152 are issued for the project prior to the commencement of construction.
- d. Meet with the design team, the Laboratory of Record and the Project Inspector to mutually communicate and understand the testing and inspection program and the methods of communication appropriate for the project.
- e. Notify the Project Inspector, in writing, of the commencement of construction of each and every aspect of the work at least 48 hours in advance by submitting form DSA 156 (or other agreed upon written documents) to the Project Inspector.
- f. Notify the Project Inspector of the completion of construction of each and every aspect of the work by submitting form DSA 156 (or other agreed upon written documents) to the Project Inspector.
- g. Consider the relationship of the signed off blocks and sections of the form DSA 152 and the commencement of subsequent work. Until the Project Inspector has signed off applicable blocks and sections of the form DSA 152, the Contractor may be prohibited from proceeding with subsequent construction activities that cover up the unapproved work. Any subsequent construction activities, that cover up the unapproved work, will be subject to a "Stop Work Order" from the DSA or the district and are subject to removal and remediation if found to be in non-compliance with the DSA approved construction documents.
- h. Submit the final verified report. All prime contractors are required to submit final Contractor Verified Reports (form DSA 6-C) to DSA and the project inspector.
 - 1) The reports are required to be submitted upon any of the following events occurring:
 - (a) The project is substantially complete. DSA considers the project to be complete when the construction is sufficiently complete in accordance with the DSA approved construction documents so that the owner can occupy or utilize the project.
 - (b) Work on the project is suspended for a period of more than one month.
 - (c) The services of the contractor are terminated for any reason prior to the completion of the project.
 - (d) DSA requests a verified report.

B. Contractor Responsibilities, General:

- 1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
- 2. Availability of Samples
 - a. Contractor shall make materials required for testing available to Laboratory and assist in acquiring these materials as directed by the District's Inspector. The samples shall be taken under the immediate direction and supervision of the Testing Laboratory or District's Inspector.
 - b. If work which is required to be tested or inspected is covered up without prior notice or approval, such work may be uncovered at the discretion of Architect at no additional cost to the District. Refer to paragraph "Payments" herein.

- c. Unless otherwise specified, Contractor shall notify Testing Laboratory a minimum of 10 working days in advance of all required tests, and a minimum of 2 working days in advance of all required inspections. All extra expenses resulting from a failure to notify the Laboratory will be paid by the District and backcharged to the Contractor.
 - d. Contractor shall give sufficient advance notice to Testing Laboratory in the event of cancellation or time extension of a scheduled test or inspection. Charges due to insufficient advance, notice of cancellations, or time extension will be paid for by the District and backcharged to the Contractor.
 - 3. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
 - 4. Provide incidental labor and facilities:
 - a. To provide access to work to be tested or inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
 - c. To facilitate tests or inspections.
 - d. To provide storage and curing of test samples.
 - 5. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
 - 6. Arrange with District's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 7. The Contractor shall notify the District's Inspector a minimum of 5 working days in advance of the manufacture of material to be supplied by him under the Contract Documents, which must be by terms of the Contract be tested, in order that the District may arrange for the testing of such material at the source of supply.
 - 8. Material shipped by the Contractor from the source of supply before having satisfactorily passed such testing and inspection or before the receipt of notice from said Inspector that such testing and inspection will not be required, shall not be incorporated in the Project.
 - 9. The District will select and pay testing laboratory costs for all tests and inspections, but may be reimbursed by the Contractor for such costs under the Contract conditions. Any direct payments by the Contractor to the testing laboratory on this project is prohibited.
- C. Contractor shall submit a written statement of responsibility to comply with CBC section 1704A.4.
- 1. Each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain the following:
 - a. Acknowledgment of awareness of the special requirements contained in the statement of special inspections;
 - b. Acknowledgment that control will be exercised to obtain conformance with the construction documents approved by the building official;

- c. Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of the reports; and
 - d. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.
- D. Contractor Responsibilities, Seismic Force-Resisting System, Designated Seismic System, and Seismic Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and District prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.
- E. Contractor Responsibilities, Wind Force-Resisting System and Wind Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and District prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.
- F. Unless otherwise directed, materials not conforming to the requirements of Contract Documents shall be promptly removed from the Project site.

3.16 MANUFACTURERS' AND FABRICATORS' FIELD SERVICES

- A. When specified in individual specification sections, require material suppliers, assembly fabricators, or product manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, to test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
 - 1. Observer subject to approval of Architect.
 - 2. Observer subject to approval of District.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary sanitary facilities.
- B. Temporary Controls: Barriers, enclosures, and fencing.
- C. Security requirements.
- D. Waste removal facilities and services.
- E. Project identification sign.

1.02 RELATED REQUIREMENTS

- A. Section 01 35 53 - Security Procedures
- B. Section 01 51 00 - Temporary Utilities.
- C. Section 01 57 19 - Temporary Environmental Controls: Filtration requirements during construction and final cleaning.

1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 1. Use 2016 as indicated in 2019 CBC Referenced Standards.
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

1.04 TEMPORARY UTILITIES - SEE SECTION 01 51 00

- A. District will provide the following:
 - 1. Electrical power and metering, consisting of connection to existing facilities.
 - 2. Water supply, consisting of connection to existing facilities.
- B. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
- C. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.05 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
 - 1. Provide temporary toilet facilities if maximum number of personnel on project is greater than 10.
 - 2. Submit proposed location of temporary toilet(s) to Construction Manager for approval.
 - a. Place on-site portable toilets away from building air intakes and entryway.
- B. Maintain daily in clean and sanitary condition.

1.06 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.07 FENCING

- A. Construction: Contractor's option.
- B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.08 EXTERIOR ENCLOSURES

- A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.09 INTERIOR ENCLOSURES

- A. Provide temporary partitions and ceilings as indicated to separate work areas from District-occupied areas, to prevent penetration of dust and moisture into District-occupied areas, and to prevent damage to existing materials and equipment.
- B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:
 - 1. STC rating of 35 in accordance with ASTM E90.
 - 2. Maximum flame spread rating of 75 in accordance with ASTM E84.
- C. Paint surfaces exposed to view from District-occupied areas.

1.10 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and District's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with District's security program.
 - 1. Include construction surveillance camera system per the District.

1.11 CAFETERIA AND FOOD

- A. Construction personnel shall police their own areas. All cups, cans, paper, wrappers, and discarded food must be placed in trash receptacles at end of each break.
- B. Contractor(s) shall submit to Construction Manager proposed location of any break areas and eating areas for approval.

1.12 SMOKING AND TOBACCO

- A. Smoking and vaping is not permitted on property.
- B. No chewing tobacco or spitting of tobacco is permitted.

1.13 VEHICULAR ACCESS AND PARKING

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Coordinate access and haul routes with governing authorities and District.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.14 WASTE REMOVAL

- A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.
- B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- C. Provide containers with lids. Remove trash from site periodically.
- D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.15 PROJECT IDENTIFICATION

- A. Provide project identification sign of design and construction indicated on drawings.
- B. Erect on site at location indicated.
- C. No other signs are allowed without District permission except those required by law.

1.16 FIELD OFFICES

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
- C. Provide separate private office similarly equipped and furnished, for use of District.
- D. Provide separate private office similarly equipped and furnished, for use of Architect and District.
- E. Locate offices a minimum distance of 30 feet from existing and new structures.

1.17 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition.
- E. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 57 19
TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Construction procedures to promote adequate indoor air quality after construction.
- B. Building flush-out after construction and before occupancy.
- C. Testing indoor air quality before commencement of construction; existing building areas only.
- D. Testing indoor air quality after completion of construction.
- E. Testing air change effectiveness after completion of construction.

1.02 PROJECT GOALS

- A. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.
 - 1. Cover duct openings and protect mechanical equipment during construction. Provide tape, plastic, sheet metal or other methods acceptable to DSA.
 - a. Comply with California Green Code Section 5.504.3.
 - 2. Cleaning of ductwork is not contemplated under this Contract.
 - 3. Contractor shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.
 - 4. Establish condition of existing ducts and equipment prior to start of alterations.
- B. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.
 - 1. Furnish products meeting the specifications.
 - 2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.

1.03 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements: Testing and inspection services.
- B. Section 01 50 00 - Temporary Facilities and Controls: Temporary construction requirements.
- C. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- D. Section 01 91 13 - General Commissioning Requirements: Verification of installed Work and it's performance.
- E. Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC): HVAC filters.
- F. Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC): Testing HVAC systems for proper air flow rates, adjustment of dampers and registers, and settings for equipment.
- G. Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC): Cleaning air ducts, equipment, and terminal units.

1.04 REFERENCE STANDARDS

- A. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
- B. ASHRAE Std 129 - Measuring Air-Change Effectiveness.
- C. ASTM D5197 - Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology).
- D. ASTM E779 - Standard Test Method for Determining Air Leakage Rate by Fan Pressurization.
- E. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers.
- F. EPA 600/4-90/010 - Compendium of Methods for the Determination of Air Pollutants in Indoor Air.
- G. EPA 625/R-96/010b - Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air.
- H. SMACNA (OCC) - IAQ Guidelines for Occupied Buildings Under Construction.

1.05 DEFINITIONS

- A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.
- B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.
- C. Particulates: Dust, dirt, and other airborne solid matter.
- D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality upon completion; use SMACNA (OCC) as a guide.
 - 1. Submit not less than 60 days before enclosure of building.
 - 2. Identify potential sources of odor and dust.
 - 3. Identify construction activities likely to produce odor or dust.
 - 4. Identify areas of project potentially affected, especially occupied areas.
 - 5. Evaluate potential problems by severity and describe methods of control.
 - 6. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
 - 7. Describe cleaning and dust control procedures.
 - 8. Describe coordination with commissioning procedures.

- C. Interior Finishes Installation Schedule: Identify each interior finish that either generates odors, moisture, or vapors or is susceptible to adsorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.
- D. Duct and Terminal Unit Inspection Report.
- E. Air Contaminant Test Plan: Identify:
 - 1. Testing agency qualifications.
 - 2. Locations and scheduling of air sampling.
 - 3. Test procedures, in detail.
 - 4. Test instruments and apparatus.
 - 5. Sampling methods.
- F. Air Contaminant Test Reports: Show:
 - 1. Location where each sample was taken, and time.
 - 2. Test values for each air sample; average the values of each set of 3.
 - 3. HVAC operating conditions.
 - 4. Certification of test equipment calibration.
 - 5. Other conditions or discrepancies that might have influenced results.
- G. Ventilation Effectiveness Test Plan: Identify:
 - 1. Testing agency qualifications.
 - 2. Description of test spaces, including locations of air sampling.
 - 3. Test procedures, in detail; state whether tracer gas decay or step-up will be used.
 - 4. Test instruments and apparatus; identify tracer gas to be used.
 - 5. Sampling methods.
- H. Ventilation Effectiveness Test Reports: Show:
 - 1. Include preliminary tests of instruments and apparatus and of test spaces.
 - 2. Calculation of ventilation effectiveness, E.
 - 3. Location where each sample was taken, and time.
 - 4. Test values for each air sample.
 - 5. HVAC operating conditions.
 - 6. Other information specified in ASHRAE Std 129.
 - 7. Other conditions or discrepancies that might have influenced results.

1.07 QUALITY ASSURANCE

- A. Testing and Inspection Agency Qualifications: Independent testing agency having minimum of 5 years experience in performing the types of testing specified.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Low VOC Materials: See Section 01 61 16.
- B. Low VOC Materials: See other sections for specific requirements for materials with low VOC content.
- C. Auxiliary Air Filters: MERV of 8, minimum, when tested in accordance with ASHRAE Std 52.2.

PART 3 EXECUTION

3.01 CONSTRUCTION PROCEDURES

- A. Prevent the absorption of moisture and humidity by adsorptive materials by:
 - 1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
 - 2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
 - 3. Provide sufficient ventilation for drying within reasonable time frame.
- B. Begin construction ventilation when building is substantially enclosed.
- C. If extremely dusty or dirty work must be conducted inside the building, shut down HVAC systems for the duration; remove dust and dirt completely before restarting systems.
- D. When working in a portion of an occupied building, prevent movement of air from construction area to occupied area.
- E. HVAC equipment and supply air ductwork may be used for ventilation during construction:
 - 1. Operate HVAC system on 100 percent outside air, with 1.5 air changes per hour, minimum.
 - 2. Ensure that air filters are correctly installed prior to starting use; replace filters when they lose efficiency.
 - 3. Do not use return air ductwork for ventilation unless absolutely necessary.
 - 4. Where return air ducts must be used for ventilation, install auxiliary filters at return inlets, sealed to ducts; use filters with at least the equivalent efficiency as those required at supply air side; inspect and replace filters when they lose efficiency.
- F. Do not store construction materials or waste in mechanical or electrical rooms.
- G. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.
 - 1. Inspect duct intakes, return air grilles, and terminal units for dust.
 - 2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
 - 3. Clean tops of doors and frames.
 - 4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.

5. Clean return plenums of air handling units.
 6. Remove intake filters last, after cleaning is complete.
- H. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.
- I. Use other relevant recommendations of SMACNA (OCC) for avoiding unnecessary contamination due to construction procedures.

3.02 BUILDING FLUSH-OUT

- A. Contractor's Option: Either full continuous flush-out OR satisfactory air contaminant testing is required, not both.
- B. Perform building flush-out before occupancy.
- C. Do not start flush-out until:
1. All construction is complete.
 2. HVAC systems have been tested, adjusted, and balanced for proper operation.
 3. Cleaning of inside of HVAC ductwork, specified elsewhere, has been completed.
 4. Inspection of inside of return air ducts and terminal units confirms that cleaning is not necessary.
 5. New HVAC filtration media have been installed.
- D. Building Flush-Out: Operate all ventilation systems at normal flow rates with 100 percent outside air until a total air volume of 14,000 cubic feet per square foot of floor area has been supplied.
1. Obtain District's concurrence that construction is complete enough before beginning flush-out.
 2. Maintain interior temperature of at least 60 degrees F and interior relative humidity no higher than 60 percent.
 3. If additional construction involving materials that produce particulates or any of the specified contaminants is conducted during flush-out, start flush-out over.
 4. If interior spaces must be occupied prior to completion of the flush-out, supply a minimum of 25 percent of the total air volume prior to occupancy, and:
 - a. Begin ventilation at least three hours prior to daily occupancy.
 - b. Continue ventilation during all occupied periods.
 - c. Provide minimum outside air volume of 0.30 cfm per square foot or design minimum outside air rate, whichever is greater.
- E. Install new HVAC filtration media after completion of flush-out and before occupancy or further testing.

3.03 AIR CONTAMINANT TESTING

- A. Contractor's Option: Either full continuous flush-out, or satisfactory air contaminant testing is required, not both.
- B. Perform air contaminant testing before starting construction, as base line for evaluation of post-construction testing.
- C. Perform air contaminant testing before occupancy.

- D. Do not start air contaminant testing until:
 - 1. All construction is complete, including interior finishes.
 - 2. HVAC systems have been tested, adjusted, and balanced for proper operation.
 - 3. Cleaning of inside of HVAC ductwork, specified elsewhere, has been completed.
 - 4. New HVAC filtration media have been installed.
- E. Indoor Air Samples: Collect from spaces representative of occupied areas:
 - 1. Collect samples while operable windows and exterior doors are closed, HVAC system is running normally as if occupied, with design minimum outdoor air, but with the building unoccupied.
 - 2. Collect samples from spaces in each contiguous floor area in each air handler zone, but not less than one sample per 25,000 square feet; take samples from areas having the least ventilation and those having the greatest presumed source strength.
 - 3. Collect samples from height from 36 inches to 72 inches above floor.
 - 4. Collect samples from same locations on 3 consecutive days during normal business hours; average the results of each set of 3 samples.
 - 5. Exception: Areas with normal very high outside air ventilation rates, such as laboratories, do not need to be tested.
 - 6. When retesting the same building areas, take samples from at least the same locations as in first test.
- F. Outdoor Air Samples: Collect samples at outside air intake of each air handler at the same time as indoor samples are taken.
- G. Analyze air samples and submit report.
- H. Air Contaminant Concentration Limits:
 - 1. Comply with CalGreen Building Standards Section 5.504.4.5, Table 504.4.4.5 "Formaldehyde Limits".
 - 2. Formaldehyde: Not more than 16.3 parts per billion.
 - 3. PM10 Particulates: Not more than 20 micrograms per cubic meter.
 - 4. Comply with CalGreen Building Standards Section 5.504, Table 504.4.3 "VOC Content Limits for Architectural Coatings".
 - 5. Comply with CalGreen Building Standards Section 5.504, Table 504.4.1 "Adhesive VOC Limit" and Table 504.4.2 "Sealant VOC Limit".
 - 6. Total Volatile Organic Compounds (TVOCs): Not more than 200 micrograms per cubic meter.
 - 7. Chemicals Listed in CAL (CDPH SM) Table 4-1, except Formaldehyde: Allowable concentrations listed in Table 4-1.
 - 8. Carbon Monoxide: Not more than 9 parts per million and not more than 2 parts per million higher than outdoor air.
 - 9. Airborne Mold and Mildew: Measure in relation to outside air; not higher than outside air.

10. Regulated Pollutants: Measure in relation to outside air; not more than contained in outside air.
- I. Air Contaminant Concentration Test Methods:
 1. Formaldehyde: ASTM D5197, EPA 625/R-96/010b Method TO-11A, or EPA 600/4-90/010 Method IP-6.
 2. Particulates: EPA 600/4-90/010 Method IP-10.
 3. Total Volatile Organic Compounds (TVOC): EPA 625/R-96/010b Method TO-1, TO-15, or TO-17; or EPA 600/4-90/010 Method IP-1.
 4. Chemicals Listed in CAL (CDPH SM) Table 4-1, except Formaldehyde: ASTM D5197, or EPA 625/R-96/010b Method TO-1, TO-15, or TO-17.
 5. Carbon Monoxide: EPA 600/4-90/010 Method IP-3, plus measure outdoor air; measure in ppm; report both indoor and outdoor measurements.
- J. If air samples show concentrations higher than those specified, ventilate with 100 percent outside air and retest at no cost to District, or conduct full building flush-out specified above.

3.04 VENTILATION EFFECTIVENESS TESTING

- A. Perform ventilation effectiveness testing during commissioning period.
- B. Do not begin ventilation effectiveness testing until:
 1. HVAC testing, adjusting, and balancing has been satisfactorily completed.
 2. Building flush-out or air contaminant testing has been completed satisfactorily.
 3. New HVAC filtration media have been installed.
- C. Test each air handler zone in accordance with ASHRAE Std 129.
- D. If calculated air change effectiveness for a particular zone is less than 0.9 due to inadequate balancing of the system, adjust, and retest at no cost to District.

END OF SECTION

SECTION 01 58 13
TEMPORARY PROJECT SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project identification sign.
- B. Project informational signs.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Responsibility to provide signs.
- B. Section 05 50 00 - Metal Fabrications: Miscellaneous connectors.
- C. Section 06 10 00 - Rough Carpentry: General requirements for structural and non-structural rough carpentry Work.
- D. Section 09 91 13 - Exterior Painting: General requirements for paint products and painting.

1.03 REFERENCE STANDARDS

- A. FHWA (SHS) - Standard Highway Signs and Markings.

1.04 QUALITY ASSURANCE

- A. Design sign and structure to withstand 80 miles/hr wind velocity.
- B. Sign Painter: Experienced as a professional sign painter for minimum three years.
 - 1. Sign painter shall be regularly engaged and specializing in the design, execution, construction and installation of exterior signage of equivalent type, size and complexity as those required for Project.
- C. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Shop Drawing: Show content, layout, lettering, color, foundation, structure, sizes and grades of members.

PART 2 PRODUCTS

2.01 SIGN MATERIALS

- A. Structure and Framing: New, wood, structurally adequate to support sign panel and suitable for specified finish.
- B. Sign Surfaces: Exterior grade plywood with medium or high density phenolic sheet overlay, minimum 3/4 inch thick, standard large sizes to minimize joints. Provide sheet thickness as required to span across framing members and provide even, smooth surface without waves or buckles.

- C. Rough Hardware: Galvanized steel, as specified in Section 05 50 00 - Metal Fabrications and Section 06 10 00 - Rough Carpentry..
- D. Sign Face Paint and Primers: Exterior quality, primer, two gloss enamel finish coats; sign background of color as selected. Provide paint type as customarily used for sign painting, adequate to resist weathering and fading for the scheduled construction period.
- E. Sign Structure Paint and Primers: Exterior quality, primer, one gloss enamel finish coats; color as selected. Provide paint type as customarily used for sign painting, adequate to resist weathering and fading for the scheduled construction period.
- F. Lettering: Exterior quality paint, colors as selected.

2.02 PROJECT IDENTIFICATION SIGN

- A. Provide painted sign of construction, design, and content shown on Drawings, location designated or agreed to by Architect.
 - 1. Graphic design, text, style of lettering, and colors shall be as directed; assume 4 colors and special graphic for Project title.
- B. Content:
 - 1. Project number, title, logo and name of District as indicated on Contract Documents.
 - 2. Include organizational logos of parties identified on sign.
 - 3. Names and titles of authorities.
 - 4. Names and titles of Architect and Consultants.
 - 5. Name of Prime Contractor and major Subcontractors.
- C. Graphic Design, Colors, Style of Lettering: Designated by Architect.
 - 1. Sign Painting: Sign panels shall be shop painted and field installed.
 - a. Sign painting shall be performed by professional sign painters. Silk screen method is recommended in order to accurately depict graphics.
 - b. Paint back and edges of sign panels for complete weather resistance and finished appearance.
- D. Project Address Signs: Provide Project name and street address signs, minimum of 4 feet wide, to identify Project to facilitate deliveries.
 - 1. Graphic design and colors shall match Project Identification Sign.
 - 2. Text shall be as directed.
- E. Lettering: Standard Alphabet Series C, as specified in FHWA (SHS).

2.03 PROJECT INFORMATIONAL SIGNS

- A. Restrictions: Signs other than Project Identification Sign specified above and Project Informational Signs specified below shall not be displayed without approval of Architect.
- B. Project Informational Signs: Informational signs, necessary for conduct of construction activities or required by governmental authorities having jurisdiction may be displayed when in conformance to sign construction and graphic requirements specified in this Section.
 - 1. Architect may review such signs. If so, review will be for sign construction, and graphic designs only.

2. Adequacy of signage for safety and conformance to requirements of authorities having jurisdiction and trade practices shall be solely Contractor's responsibility.
- C. Painted informational signs of same colors and lettering as Project Identification sign, or standard products; size lettering to provide legibility at 100 foot distance.
 1. Colors shall be as required by authorities having jurisdiction and, if not otherwise required, of colors consistent with Project graphics.
 2. Informational signage shall be produced by professional sign painters and be of size and lettering style consistent with use.
- D. Provide at each field office, storage shed, and directional signs to direct traffic into and within site. Relocate as Work progress requires.
- E. Provide municipal traffic agency directional traffic signs to and within site.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install project identification sign within 30 days after date fixed by Notice to Proceed.
- B. Erect at location of high public visibility adjacent to main entrance to site.
- C. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
- D. Install sign surface plumb and level, with butt joints. Anchor securely.
- E. Paint exposed surfaces and edges of sign, supports, and framing for a finished appearance.
- F. Project Identification Sign Installation
 1. Construction: Construct sign support structure and install panels in durable manner, to resist high winds.
 2. Installation: Erect Sign on site at a lighted location of high public visibility, adjacent to the main entrance to the site, as approved by Architect.
 - a. Install sign at height for optimum visibility, on ground-mounted poles or attached to portable structure on skids.
 - b. Portable structure shall resist overturning force of wind.
 3. Street Address Signs: Locate and install signs at each access point from public streets.
- G. Project Informational Signs Installation:
 1. Construction: Construct sign support structure and install panels in durable manner, to resist high winds.
 2. Project Informational Signs Installation:
 - a. Locate signs as necessary for construction activities and as required by authorities having jurisdiction.
 - b. Install informational signs for optimum visibility, on ground-mounted posts or temporarily attached to surfaces of structures.
 - c. Attachment methods shall leave no permanent disfiguration or discoloration on completed Work.

3.02 MAINTENANCE

- A. Maintain signs and supports neat clean condition. Repair all deterioration, weathering and damage to structure framing, and signage.
- B. Sign Relocation: Relocate signs as required by progress of the Work.

3.03 REMOVAL

- A. Remove signs, framing, supports, and foundations at completion of Project and restore the area prior to Substantial Completion review.

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
 - 1. System Completeness.
 - 2. Installation of Products.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations.
- E. Procedures for District-supplied products.
- F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Identification of District-supplied products.
- B. Section 01 25 00 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
- C. Section 01 40 00 - Quality Requirements: Product quality monitoring.
- D. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
- E. Section 01 74 19 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.
- F. Divisions 31 - 33: Sitework.

1.03 REFERENCE STANDARDS

- A. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers.
- B. NFPA 70 - National Electrical Code.
 - 1. Use California Electrical Code.

1.04 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
 - 1. Submit within 15 days after date of Agreement.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

- C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

1.05 QUALITY ASSURANCE

- A. CAL (CDPH SM) v1.1: California Department of Public Health (CDPH) Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, v. 1.1–2010, for the emissions testing and requirements of products and materials.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Drawings and Specifications:
 - 1. If a conflict exists between the Drawings and the Specifications (Project Manual), then the Contractor is to submit a Request for Interpretation from the Architect.
 - a. As noted in the General Conditions, the more stringent requirements govern, including cost of materials and/or installation.
 - 2. If a specific product is indicated on the Drawings for use, then that product is to be used without exception in the location identified.
 - 3. If the Contractor proposes the use of another product other than the item indicated, whether or not listed in these specifications, Contractor is to submit the product using the complete substitution process. See the the Article titled "SUBSTITUTIONS".
 - 4. DSA (Division of the State Architect) approval is also required prior to the use or installation of any substitution, on any product or location of product (requiring a revision to the Drawings or Specifications), included in these construction documents.
 - a. Installation of a non-approved product may result in the Contractor removing and replacing the non-approved product at the Contractor's own expense.
- B. General: Items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock, and include materials, equipment, assemblies, fabrications and systems.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model designations indicated in the manufacturer's published product data.
 - 2. Materials: Products that are shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed or installed to form a part of the Work.
 - 3. Equipment: A product with operating parts, whether motorized or manually operated, that requires connections such as wiring or piping.

- C. Specific Product Requirements: Refer to requirements of Section 01 40 00 - Quality Requirements and individual product technical Sections for specific requirements for products.
- D. Minimum Requirements: Specified requirements for products are minimum requirements. Refer to general requirements for quality of the Work specified in Section 01 40 00 - Quality Requirements and elsewhere herein.
- E. Standard Products:
 - 1. Where specific products are not specified, provide standard products of types and kinds that are suitable for the intended purposes and that are usually and customarily used on similar projects under similar conditions.
 - 2. Products shall be as selected by Contractor and subject to review and acceptance by the District and Architect.
- F. Product Completeness:
 - 1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
 - 2. Comply with additional requirements specified herein in Article titled "SYSTEM COMPLETENESS".
- G. Code Compliance:
 - 1. All products, other than commodity products prescribed by Code, are to have a current ICC Evaluation Service Research Report (ICC ESR), CABO National Evaluation Report (NER), or other testing agencies as accepted by the Division of the State Architect.
 - 2. Refer to additional requirements specified in Section 01 41 00 - Regulatory Requirements.

2.02 SYSTEM COMPLETENESS

- A. The Contract Drawings and Specifications are not intended to be comprehensive directions on how to produce the Work. Rather, the Drawings and Specifications are instruments of service prepared to describe the design intent for the completed Work.
- B. It is intended that all equipment, systems and assemblies be complete and fully functional even though not fully described. Provide all products and operations necessary to achieve the design intent described in the Contract Documents.
- C. Refer to related general requirements specified in Section 01 41 00 - Regulatory Requirements regarding compliance with minimum requirements of applicable codes, ordinances and standards.
- D. Omissions and Misdescriptions: Contractor shall report to Architect immediately when elements essential to proper execution of the Work are discovered to be missing or misdescribed in the Drawings and Specifications or if the design intent is unclear.
 - 1. Should an essential element be discovered as missing or misdescribed prior to receipt of Bids, an Addendum will be issued so that all costs may be accounted for in the Contract Sum.

2. Should an obvious omission or misdescription of a necessary element be discovered and reported after execution of the Agreement, Contractor shall provide the element as though fully and correctly described, and a no-cost Change Order shall be executed.
3. Refer to related General Requirements specified in Section 01 30 00 - Administrative Requirements and 01 31 14 - Facility Services Coordination regarding construction interfacing and coordination.

2.03 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
 1. Provide products that fully comply with the Contract Documents, are undamaged and unused at installation.
 2. Comply with additional requirements specified herein in Article titled "PRODUCT OPTIONS".
- B. See Section 01 40 00 - Quality Requirements, for additional source quality control requirements.
- C. Use of products having any of the following characteristics is not permitted:
 1. Made outside the United States, its territories, Canada, or Mexico.
 2. Containing lead, cadmium, or asbestos.
- D. Where other criteria are met, Contractor shall give preference to products that:
 1. If used on interior, have lower emissions, as defined in Section 01 61 16.
 2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.
 3. Are extracted, harvested, and/or manufactured closer to the location of the project.
 4. Have longer documented life span under normal use.
 5. Result in less construction waste. See Section 01 74 19
- E. Provide interchangeable components of the same manufacture for components being replaced.
 1. To the fullest extent possible, provide products of the same kind from a single source. Products required to be supplied in quantity shall be the same product and interchangeable throughout the Work.
 2. When options are specified for the selection of any of two or more products, provide product selected to be compatible with products previously selected.
- F. Product Nameplates and Instructions:
 1. Except for required Code-compliance labels and operating and safety instructions, locate nameplates on inconspicuous, accessible surfaces. Do not attach manufacturer's identifying nameplates or trademarks on surfaces exposed to view in occupied spaces or to the exterior.
 2. Provide a permanent nameplate on each item of service-connected or power-operated equipment. Nameplates shall contain identifying information and essential operating data such as the following example:
 - a. Name of manufacturer
 - b. Name of product

- c. Model and serial number
 - d. Capacity
 - e. Operating and Power Characteristics
 - f. Labels of Tested Compliance with Codes and Standards
3. Refer to additional requirements which may be specified in various sections, as included in this Project Manual.
 4. For each item of service-connected or power-operated equipment, provide operating and safety instructions, permanently affixed and of durable construction, with legible machine lettering. Comply with all applicable requirements of authorities having jurisdiction and listing agencies.
- G. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to CEC/NFPA 70, include lugs for terminal box.
 - H. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.04 PRODUCT OPTIONS

- A. Unless the specifications state that no substitution is permitted, whenever the Contract Documents indicate any specific article, device, equipment, product, material, fixture, patented process, form, method, or type of construction or any specific name, make, trade name, or catalog number, with or without the words "or equal," such specification shall be deemed to be used for the purpose of facilitating description of the material, process, or article desired and shall be deemed to be followed by the words "or equal."
 1. See Section 01 25 00 - Substitution Procedures.
- B. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
 1. Reference Standards:
 - a. Where Specifications require compliance with a standard, provided product shall fully comply with the standard specified.
 - b. Refer to general requirements specified in Section 01 42 19 - Reference Standards regarding compliance with referenced standards, standard specifications, codes, practices and requirements for products.
 2. Product Description:
 - a. Where Specifications describe a product, listing characteristics required, with or without use of a brand name, provide a product that has the specified attributes and otherwise complies with specified requirements.
 3. Performance Requirements:
 - a. Where Specifications require compliance with performance requirements, provide product(s) that comply and are recommended by the manufacturer for the intended application.
 - b. Verification of manufacturer's recommendations may be by product literature or by certification of performance from manufacturer.

- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.
- D. Products Specified by Identification of Manufacturer and Product Name or Number:
 - 1. "Specified Manufacturer": Provide the specified product(s) of the specified manufacturer.
 - a. If only one manufacturer is specified, without "acceptable manufacturers" being identified, provide only the specified product(s) of the specified manufacturer.
 - b. If District standard is indicated make all efforts to provide that product.
 - c. If the phrase "or equal" or "approved equal" is stated or reference is made to the "or equal provision," products of other manufacturers may be provided if such products are equivalent to the specified product(s) of the specified manufacturer.
 - 1) Equivalence shall be demonstrated by submission of information in compliance with requirements of Section 01 25 00 - Substitution Procedures.
 - 2. "Acceptable Manufacturers":
 - a. Product(s) of the named manufacturers, if equivalent to the specified product(s) of the specified manufacturer, will be acceptable in accordance with the requirements of Section 01 25 00 - Substitution Procedures.
 - 1) Exception: Considerations regarding changes in Contract Time and Contract Sum will be waived if no increase in Contract Time or Contract Sum results from use of such equivalent products.
 - 3. Unnamed manufacturers: Product(s) of unnamed manufacturers will be acceptable when disclosed during the bidding period and only as follows:
 - a. Unless specifically stated that substitutions will not be accepted or considered, the phrase "or equal" shall be assumed to be included in the description of specified product(s).
 - b. Equivalent products of unnamed manufacturers will be accepted in accordance with the "or equal" provision specified herein, below.
 - c. If provided, products of unnamed manufacturers shall be subject to the requirements of Section 01 25 00 - Substitution Procedures.
 - 4. Quality basis:
 - a. Specified product(s) of the specified manufacturer shall serve as the basis by which products by named acceptable manufacturers and products of unnamed manufacturers will be evaluated.
 - b. Where characteristics of the specified product are described, where performance characteristics are identified or where reference is made to industry standards, such characteristics are specified to identify the most significant attributes of the specified product(s) which will be used to evaluate products of other manufacturers.
- E. Products Specified by Combination of Methods: Where products are specified by a combination of attributes, including manufacturer's name, product brand name, product catalog or identification number, industry reference standard, or description of product characteristics, provide products conforming to all specified attributes.
- F. "Or Equal" Provision: Where the phrase "or equal" or the phrase "or approved equal" is included, equivalent product(s) of unnamed manufacturer(s) may be provided as specified

above in subparagraph titled "Unnamed manufacturers" and Section 01 25 00 - Substitution Procedures with the following conditions:

1. The requirements of Section 01 25 00 - Substitution Procedures applies to products provided under the "or equal" provision.
 - a. Exception: If the proposed product(s) are determined to be equivalent to the specified product(s) of the specified manufacturer, the requirement specified for substitutions to result in a net reduction in Contract Time or Contract Sum will be waived.
 2. Use of product(s) under the "or equal" provision shall not result in any delay in completion of the Work, including completion of portions of the Work for use by District or for work under separate contract by District.
 3. Use of product(s) under the "or equal" provision shall not result in any costs to the District, including design fees and permit and plan check fees.
 4. Use of product(s) under the "or equal" provision shall not require substantial change in the intent of the design, in the opinion of the Architect.
 - a. The intent of the design shall include functional performance and aesthetic qualities.
 5. The determination of equivalence will be made by the Architect and District, and such determination shall be final.
- G. Visual Matching:
1. Where Specifications require matching a sample, the decision by the Architect on whether a proposed product matches shall be final.
 2. Where no product visually matches but the product complies with other requirements, comply with provisions for substitutions for selection of a matching product in another category.
- H. Visual Selection of Products:
1. Where requirements include the phrase "as selected from manufacturer's standard colors, patterns and textures", or a similar phrase, selections of products will be made by indicated party or, if not indicated, by the Architect. The will select color, pattern and texture from the product line of submitted manufacturer, if all other specified provisions are met.
 2. The Architect will select color, pattern and texture from the product line of submitted manufacturer, if all other specified provisions are met.

2.05 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 01 25 00 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

- A. See Section 01 10 00 - Summary for identification of District-supplied products.
- B. District's Responsibilities:
 - 1. Arrange for and deliver District reviewed shop drawings, product data, and samples, to Contractor.
 - 2. Arrange and pay for product delivery to site.
 - 3. On delivery, inspect products jointly with Contractor.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.
- C. Contractor's Responsibilities:
 - 1. Review District reviewed shop drawings, product data, and samples.
 - 2. Receive and unload products at site; inspect for completeness or damage jointly with District.
 - 3. Handle, store, install and finish products.
 - 4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
 - 1. Schedule delivery to minimize long-term storage and prevent overcrowding construction spaces.
 - 2. Coordinate with installation to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport products by methods to avoid product damage.
- F. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- G. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- H. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- I. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

- A. Provide protection of stored materials and products against theft, casualty, or deterioration.
- B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 74 19.
 - 1. Structural Loading Limitations: Handle and store products and materials so as not to exceed static and dynamic load-bearing capacities of project floor and roof areas.
- C. Inspection Provisions: Arrange storage to provide access for inspection and measurement of quantity or counting of units.
- D. Structural Considerations: Store heavy materials away from the structure in a manner that will not endanger supporting construction.
- E. Store and protect products in accordance with manufacturers' instructions.
- F. Store with seals and labels intact and legible.
- G. Arrange storage of materials and products to allow for visual inspection for the purpose of determination of quantities, amounts, and unit counts.
- H. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- I. For exterior storage of fabricated products, place on sloped supports above ground.
 - 1. Place products on raised blocks, pallets or other supports, above ground and in a manner to not create ponding or misdirection of runoff.
- J. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- K. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
 - 1. Periodically inspect to ensure products are undamaged, and are maintained under required conditions.
 - 2. Remove and replace products damaged by improper storage or protection with new products at no change in Contract Sum or Contract Time.
 - 3. Weather-Resistant Storage:
 - a. Store moisture-sensitive products above ground, under cover in a weathertight enclosure or covered with an impervious sheet covering. Provide adequate ventilation to avoid condensation.
 - b. Maintain storage within temperature and humidity ranges required by manufacturer's instructions.
 - c. Store loose granular materials on solid surfaces in a well-drained area. Prevent mixing with foreign matter.
- L. Comply with manufacturer's warranty conditions, if any.
- M. Do not store products directly on the ground.
- N. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

- O. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- P. Prevent contact with material that may cause corrosion, discoloration, or staining.
- Q. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- R. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

3.05 INSTALLATION OF PRODUCTS

- A. Comply with manufacturer's instructions and recommendations for installation of products, except where more stringent requirements are specified, are necessary due to Project conditions or are required by authorities having jurisdiction.
- B. Anchor each product securely in place, accurately located and aligned with other Work.
- C. Clean exposed surfaces and provide protection to ensure freedom from damage and deterioration at time of Substantial Completion review. Refer to additional requirements specified in General Conditions, Section 01 50 00 - Temporary Construction Facilities and Controls and 01 70 00 - Execution and Closeout Requirements.

3.06 PROTECTION OF COMPLETED WORK

- A. Provide barriers, substantial coverings and notices to protect installed Work from traffic and subsequent construction operations.
- B. Remove protective measures when no longer required and prior to Substantial Completion review of the Work.
- C. Comply with additional requirements specified in Section 01 50 00 - Temporary Construction Facilities and Controls.

END OF SECTION

SECTION 01 61 16
VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements for Indoor-Emissions-Restricted products.
- B. Requirements for VOC-Content-Restricted products.
- C. Requirement for installer certification that they did not use any non-compliant products.

1.02 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- B. Section 01 40 00 - Quality Requirements: Procedures for testing and certifications.
- C. Section 01 60 00 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.
- D. Section 07 92 00 - Joint Sealants: Emissions-compliant sealants.

1.03 DEFINITIONS

- A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
 - 1. Interior paints and coatings applied on site.
 - 2. Interior adhesives and sealants applied on site, including flooring adhesives.
 - 3. Flooring.
 - 4. Products making up wall and ceiling assemblies.
 - 5. Thermal and acoustical insulation.
 - 6. Other products when specifically stated in the specifications.
- B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
 - 1. Exterior and interior paints and coatings.
 - 2. Exterior and interior adhesives and sealants, including flooring adhesives.
 - 3. Wet-applied roofing and waterproofing.
 - 4. Other products when specifically stated in the specifications.
- C. Interior of Building: Anywhere inside the exterior weather barrier.
- D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.
- F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:

1. Concrete.
2. Clay brick.
3. Metals that are plated, anodized, or powder-coated.
4. Glass.
5. Ceramics.
6. Solid wood flooring that is unfinished and untreated.

1.04 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency.
- B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
- C. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers.
- D. CARB (ATCM) - Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products; California Air Resources Board.
- E. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board.
- F. CHPS (HPPD) - High Performance Products Database.
- G. CRI (GL) - Green Label Testing Program - Certified Products.
- H. CRI (GLP) - Green Label Plus Testing Program - Certified Products.
- I. GreenSeal GS-36 - Adhesives for Commercial Use.
- J. SCAQMD 1113 - Architectural Coatings.
- K. SCAQMD 1168 - Adhesive and Sealant Applications.
- L. SCS (CPD) - SCS Certified Products.
- M. UL (GGG) - GREENGUARD Gold Certified Products.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.
- C. Installer Certifications Regarding Prohibited Content: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of installer's products, or 2) that such products used comply with these requirements.
 1. Use the form following this section for installer certifications.
- D. Verification of compliance with VOC limits as specified in the CalGreen Code Section 5.504 shall be provided at the request of the Building Inspector.
 1. Product certification and specifications.

2. Chain of custody certifications.
3. Product, labeled and invoiced as meeting the Composite Wood Products regulation.
4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards
5. Other methods approved by the building official.

1.06 QUALITY ASSURANCE

- A. Indoor Emissions Standard and Test Method: CAL (CDPH SM), using Standard Private Office exposure scenario and the allowable concentrations specified in the method, and range of total VOC's after 14 days.
 1. Wet-Applied Products: State amount applied in mass per surface area.
 2. Paints and Coatings: Test tinted products, not just tinting bases.
 3. Evidence of Compliance: Acceptable types of evidence are the following;
 - a. Current UL (GGG) certification.
 - b. Current SCS (CPD) Floorscore certification.
 - c. Current SCS (CPD) Indoor Advantage Gold certification.
 - d. Current listing in CHPS (HPPD) as a low-emitting product.
 - e. Current CRI (GLP) certification.
 - f. Test report showing compliance and stating exposure scenario used.
 4. Product data submittal showing VOC content is NOT acceptable evidence.
 5. Manufacturer's certification without test report by independent agency is NOT acceptable evidence.
- B. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Report of laboratory testing performed in accordance with requirements.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
- C. Composite Wood Emissions Standard: CARB (ATCM) for ultra-low emitting formaldehyde (ULEF) resins.
 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Current SCS "No Added Formaldehyde (NAF)" certification; www.scs-certified.com.
 - b. Report of laboratory testing performed in accordance with requirements.
 - c. Published product data showing compliance with requirements.
 - d. Certification by manufacturer that product complies with requirements.
- D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. All VOC restricted products shall be compliant with local jurisdiction, South Coast Air Quality Management District, Air Pollution Control District, County of San Diego, and California Green Standards Code, Rules and Regulations in effect at the time of installation. Products specified in this project shall be used as a basis of design. Updated products that are compliant with the rules in force at the time of installation shall be submitted as substitutions when they become available.
 - 1. If a product is found to be non-compliant with the VOC rules at the scheduled time of installation, notify the Architect a minimum of 90 days prior to installation. Contractor shall submit a suggested compliant product that is equal to the performance and cost of the specified product using the substitution procedure.

2.02 MATERIALS

- A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.
- B. Indoor-Emissions-Restricted Products: Comply with Indoor Emissions Standard and Test Method, except for:
 - 1. Composite Wood, Wood Fiber, and Wood Chip Products: Comply with Composite Wood Emissions Standard or contain no added formaldehyde resins.
 - a. Comply with CalGreen Building Standards Section 5.504.4.5, Table 504.4.4.5 "Formaldehyde Limits".
 - 2. Inherently Non-Emitting Materials.
- C. VOC-Content-Restricted Products: VOC content not greater than required by the following:
 - 1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
 - 2. Aerosol Adhesives: GreenSeal GS-36.
 - 3. Joint Sealants: SCAQMD 1168 Rule.
 - 4. Paints and Coatings: Each color; most stringent of the following:
 - a. 40 CFR 59, Subpart D.
 - b. SCAQMD 1113 Rule.
 - c. CARB (SCM).
 - d. CalGreen Building Standards Section 5.504, Table 504.4.3 "VOC Content Limits for Architectural Coatings".
 - e. Clear Wood Finishes, Floor Coatings, Stains, Primers and Shellacs: Do not exceed the VOC content limits established in SCAQMD 1113 rule.
 - 5. Wet-Applied Roofing and Waterproofing: Comply with requirements for paints and coatings.
 - 6. Carpet, Carpet Tile, and Adhesive: Provide products having VOC content not greater than that required for CRI (GLP) certification.

- a. Comply with CalGreen Building Standards Section 5.504, Table 504.4.1 "Adhesive VOC Limit".
- 7. Carpet Cushion: Provide products having VOC content not greater than that required for CRI (GL) certification.
 - a. Comply with CalGreen Building Standards Section 5.504, Table 504.4.1 "Adhesive VOC Limit".
- D. Other Product Categories: Comply with limitations specified elsewhere.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

- A. District reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to District.
- B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

SECTION 01 61 16.01

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

.01 FORM

A. Identification:

- 1. Project Name: Science Building Modernization
- 2. Project No.: 1-30-50
- 3. Architect: Ruhnau Clarke Architects

B. Use of This Form:

- 1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
 - a. Each installer of work on this project is required to certify that his/their use of these particular materials complies with the contract documents and to provide documentation showing that the products used do not contain the prohibited content.
- 2. Contractor is required to obtain and submit this form from each installer of work on this project.
- 3. For each product category listed, check the correct paragraph.
- 4. If any of these accessory materials has been used, attach to this form product data and MSDS sheet for each such product.

C. VOC content restrictions are specified in Section 01 61 16.

- 1. Volatile organic compounds (VOCs) are defined by the U.S. EPA, California Air Resources Board (CARB), South Coast Air Quality Management District (SCAQMD), along with other state and local regulations applicable to this project.

1.01 PRODUCT CERTIFICATION

A. I certify that the installation work of my firm on this project:

- 1. [HAS] [HAS NOT] required the use of any ADHESIVES.
- 2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
- 3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
- 4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

B. Product data and MSDS sheets are attached.

2.01 CERTIFIED BY: (INSTALLER/MANUFACTURER/SUPPLIER FIRM)

A. Firm Name: _____

- B. Print Name: _____
- C. Signature: _____
- D. Title: _____ (officer of company)
- E. Date: _____

END OF SECTION

SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.
- H. Demonstration and instruction of District personnel.
- I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- J. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 01 30 00 - Administrative Requirements: Submittals procedures.
- C. Section 01 31 14 - Facility Services Coordination: Coordination of trades and BIM documents.
- D. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.
- E. Section 01 45 33 - Code-Required Special Inspections: Construction oversight procedures by DSA regarding the execution, approval, and closeout of this building project.
- F. Section 01 50 00 - Temporary Facilities and Controls: Temporary exterior enclosures.
- G. Section 01 50 00 - Temporary Facilities and Controls: Temporary interior partitions.
- H. Section 01 74 19 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
- I. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.
- J. Section 01 79 00 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections
- K. Section 02 41 00 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.
- L. Section 07 84 00 - Firestopping.
- M. Individual Product Specification Sections:
 - 1. Advance notification to other sections of openings required in work of those sections.

2. Limitations on cutting structural members.

1.03 REFERENCE STANDARDS

- A. CFC Ch. 33 - Fire Safety During Construction and Demolition.
- B. CFC Ch. 35 - California Fire Code - Chapter 35 - Welding and Other Hot Work.
- C. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
 1. On request, submit documentation verifying accuracy of survey work.
 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
 3. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 1. Structural integrity of any element of Project.
 2. Integrity of weather exposed or moisture resistant element.
 3. Efficiency, maintenance, or safety of any operational element.
 4. Visual qualities of sight exposed elements.
 5. Work of District or separate Contractor.
 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work. Include shop drawings as necessary to identify locations and communicate descriptions.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Effect on work of District or separate Contractor.
 - f. Effect on existing construction of District and, if applicable, work for Project being provided by District under separate contract.
 - g. Written permission of affected separate Contractor.
 - h. Date and time work will be executed.
 7. Include written evidence that those performing work under separate contract for District have been notified and acknowledge that cutting and patching work will be occurring. Include written permission for intended cutting and patching, included scheduled times.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS

- A. For demolition work, employ a firm specializing in the type of work required.
 1. Minimum of 5 years of documented experience.

- B. For surveying work, employ a land surveyor registered in California and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,
- C. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in California. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.
- D. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in California.

1.06 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 - 1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
- E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - 1. Minimize amount of bare soil exposed at one time.
 - 2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 - 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
 - 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
 - 1. At All Times: Excessively noisy tools and operations will not be tolerated inside the building at any time of day; excessively noisy includes jackhammers.
 - 2. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
- G. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- H. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

- A. See Section 01 10 00 for occupancy-related requirements.
- B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- C. Notify affected utility companies and comply with their requirements.
- D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of work of separate sections.
- H. After District occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of District's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.
- D. Temporary Supports: Provide supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
- E. Weather Protection: Provide protection from elements for areas which may be exposed by uncovering Work. Maintain excavations free of water.

3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
 - 1. Coordinate operations of the various trades to assure efficient and orderly installation of each part of Work.
 - 2. Coordinate Work operations of the various trades that depend on each other for proper installation, connection, and operation of Work, including but not limited to:
 - a. Schedule construction operations in sequence required where installation of one part of Work depends on installation of other components, before or after its own installation.
 - b. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
 - c. Provide provisions to accommodate items scheduled for later installation.
 - 3. Prepare and administer coordination drawings. Refer to Section 01 31 14 - Facility Services Coordination.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, District, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

- A. Notify the District at least 48 hours before staking is to be started.
- B. Verify locations of survey control points prior to starting work.
- C. Promptly notify Architect of any discrepancies discovered.

- D. Contractor shall locate and protect survey control and reference points.
- E. Control datum for survey is that established by District provided survey.
- F. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- G. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- H. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- I. Utilize recognized engineering survey practices.
- J. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- K. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 - 2. Grid or axis for structures.
 - 3. Building foundation, column locations, ground floor elevations.
- L. Periodically verify layouts by same means.
- M. Maintain a complete and accurate log of control and survey work as it progresses.
- N. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

3.05 GENERAL INSTALLATION REQUIREMENTS

- A. Dimensions for Accessibility:
 - 1. Conventions: See CBC Figure 11B-104. Dimensions that are not stated as "maximum" or "minimum" are absolute.
 - 2. Tolerances shall be per CBC 11B-104.1.1 "Construction and manufacturing tolerances. All dimensions are subject to conventional industry tolerances except where the requirement is stated as a range with specific minimum and maximum end points."
- B. In addition to compliance with regulatory requirements, conduct construction operations in compliance with CFC Ch. 33 and NFPA 241, including applicable recommendations in Appendix A.
- C. When welding or doing other hot work, comply with CFC Ch. 35.
- D. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- E. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- F. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- G. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

- H. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 .
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
 - 1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
 - 2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
 - 2. Remove items indicated on drawings.
 - 3. Relocate items indicated on drawings.
 - 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 - 5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 - 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 - 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

- a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. Provide temporary connections as required to maintain existing systems in service.
- 4. Verify that abandoned services serve only abandoned facilities.
- 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- F. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
- G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
 - 1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
 - 2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
 - 3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
 - 4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.
- H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- I. Refinish existing surfaces as indicated:
 - 1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 - 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- J. Clean existing systems and equipment.
- K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- L. Do not begin new construction in alterations areas before demolition is complete.
- M. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.

- C. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove samples of installed work for testing when requested.
 - 8. Remove and replace defective and non-complying work.
- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
 - 1. Coordinate installation or application of products for integrated Work.
 - 2. Uncover completed Work as necessary to install or apply products out of sequence.
 - 3. Remove and replace defective or non-conforming Work.
 - 4. Provide openings for penetration of utility services, such as plumbing, mechanical and electrical Work.
- E. After uncovering existing Work, inspect conditions affecting proper accomplishment of Work.
- F. Temporary Supports: Provide supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
- G. Beginning of cutting or patching shall be interpreted to mean that existing conditions were found by Contractor to be acceptable.
- H. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- I. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
 - 1. Use a diamond grit abrasive saw or similar cutter for smooth edges. Do not overcut corners.
- J. Restore work with new products in accordance with requirements of Contract Documents.
- K. Fit work neat and tight allowing for expansion and contraction.
- L. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- M. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.
- N. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.

3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.
- O. Finishing: Refinish surfaces to match adjacent and similar finishes as used for the Project.
1. For continuous surfaces, refinish to nearest intersection or natural break.
 2. For an assembly, refinish entire unit.

3.08 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and Owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or

system installation prior to start-up, and to supervise placing equipment or system in operation.

- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 PROJECT CLOSEOUT CONFERENCE

- A. Schedule and conduct a project closeout conference, at a time convenient to District and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
 - 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of District, Commissioning Authority (CxA), Architect, and relevant consultants; Contractor and project superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Commissioning.
 - c. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - d. Submittal of written warranties.
 - e. Coordination of separate contracts.
 - f. District's partial occupancy requirements.
 - g. Installation of District's furniture, fixtures, and equipment.
 - h. Responsibility for removing temporary facilities and controls.
 - 4. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, District, participants, and those affected by decisions made.

3.12 DEMONSTRATION AND INSTRUCTION

- A. See Section 01 79 00 - Demonstration and Training.

3.13 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC.

3.14 FINAL CLEANING

- A. Cleaning and Disposal Requirements, General: Conduct cleaning and disposal operations in compliance with all applicable codes, ordinances and regulations, including environmental protection laws, rules and practices.
- B. Execute final cleaning prior to final project assessment.

1. Clean areas to be occupied by District prior to final completion before District occupancy.
- C. Substantial Completion Review Cleaning, General: Execute a thorough cleaning prior to Substantial Completion review by Architect and District. Employ experienced workers or professional cleaners for cleaning operations for Substantial Completion review.
- D. Use cleaning materials that are nonhazardous.
 1. Cleaning Agents and Materials: Use only those cleaning agents and materials which will not create hazards to health or property and which will not damage or degrade surfaces.
 - a. Use only those cleaning agents, materials and methods recommended by manufacturer of the material to be cleaned.
 - b. Use cleaning materials only on surfaces recommended by cleaning agent manufacturer.
 - c. Before use, review cleaning agents and materials with Construction Manager for suitability and compatibility. Use no cleaning agents and materials without approval as noted above.
 2. Cleaning Procedures: All cleaning processes, agents and materials shall be subject to Architect, District and/or Construction Manager review and approval. Processes and degree of cleanliness shall be as directed by Architect, District and/or Construction Manager.
- E. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- F. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- G. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- H. Clean filters of operating equipment.
- I. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.
- J. Clean site; sweep paved areas, rake clean landscaped surfaces.
- K. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.15 CLOSEOUT PROCEDURES

- A. Clean-Up Retainage:
 1. Five (5) percent of each Contractor's bid will automatically be held in abeyance in their contract schedule of values for clean-up.
 2. If in the Construction Manager's opinion the Contractor is maintaining a clean project, a pro-rata share of this clean-up budget will be paid monthly to the Contractor in accordance with their approximate aggregate percentage of completion of the project.

3. If a Contractor fails to heed written directives to clean-up during the course of the project, the work will be done at the Contractor's expense and a deductive change order will be written against their contract with the District.
 4. The establishment of this 5 percent budget in no way limits the cost for the Contractor to maintain a clean project.
- B. Make submittals that are required by governing or other authorities.
 1. Provide copies to Architect and District.
 - C. Accompany Architect, Construction Manager, and District Representative on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's comprehensive list of items to be completed or corrected.
 1. As authorized by the District; Architect and Architect's and District's consultants, as appropriate, will attend a meeting at the Project site to review Contract closeout procedures and to review the list of items to be completed and corrected (punch list) to make the Work ready for acceptance by the District.
 2. This meeting shall be scheduled not earlier than 14 days prior to the date anticipated for the Substantial Completion review.
 - D. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
 - E. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
 1. Final Application for Payment: In the Application for Payment that coincides with the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed substantially complete.
 2. Warranties, Bonds and Certificates: Submit specific warranties, guarantees, workmanship bonds, maintenance agreements, final certifications and similar documents.
 3. Locks and Keys: Change temporary lock cylinders over to permanent keying and transmit keys to the District, unless otherwise directed or specified.
 4. Tests and Instructions: Complete start-up testing of systems, and instruction of the District's personnel. Remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
 - F. Clearing and Cleaning: Prior to the Substantial Completion review, Contractor shall conduct a thorough cleaning and clearing of the Project area, including removal of construction facilities and temporary controls.
 - G. Inspection and Testing: Prior to the Substantial Completion review, complete inspection and testing required for the Work, including securing of approvals by authorities having jurisdiction.
 1. Complete all inspections, tests, balancing, sterilization and cleaning of plumbing and HVAC systems.

2. Complete inspections and tests of electrical power and signal systems.
 3. Complete inspections and tests of conveying (elevator or wheelchair lift) systems.
- H. District will occupy all of the building as specified in Section 01 10 00.
- I. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
1. Correction (Punch) List: Contractor shall prepare and distribute at the preliminary Contract closeout review meeting, a typewritten, comprehensive list of items to be completed and corrected (punch list) to make the Work ready for acceptance by the District.
 - a. The punch list shall include all items to be completed or corrected prior to the Contractor's application for final payment.
 - b. The punch list shall identify items by location (room number or name) and consecutive number. For example, 307-5 would identify item 5 in Room 307, Roof-4 would identify item 4 on Roof.
 - c. Contractor shall prepare separate lists according to categories used for Drawings. For example, provide lists for Architectural, Structural, Plumbing, Mechanical, Electrical, Fire Protection, Civil, and Landscape.
 - d. Architect, Architect's consultants and District's consultants, if in attendance, will conduct a brief walk-through of Project with the Contractor to review scope and adequacy of the punch list.
 - e. Verbal comments will be made to the Contractor by the Construction Manager, the Architect and the Architect's and District's consultants, if in attendance, during the walk-through. These comments will indicate generally the additions and corrections to be made to the punch list. Such comments shall not be considered to be comprehensive; Contractor shall use the comments as guidance in preparing the punch list for the Substantial Completion review.
 2. Substantial Completion Meeting: On a date mutually agreed by the District, Architect, and Contractor, a meeting shall be conducted at the Project site to determine whether the Work is satisfactory and complete for filing a Notice of Completion (Substantial Completion).
 - a. Contractor shall provide three working days notice to Architect for requested date of Substantial Completion meeting.
 - b. The Construction Manager, the Architect and the Architect's and District's consultants, as authorized by the District, will attend the Substantial Completion meeting.
 - c. In addition to conducting a walk-through of the facility and reviewing the punch list, the purpose of the meeting shall include submission of warranties, guarantees and bonds to the District, submission of operation and maintenance data (manuals), provision of specified extra materials to the District, and submission of other Contract closeout documents and materials as required and if not already submitted.

- d. The Construction Manager, the Architect and Architect's consultants, as appropriate, will conduct a walk-through of the facility with the Contractor and review the punch list.
 - e. Contractor shall correct the punch list and record additional items as may identified during the walk-through, including notations of corrective actions to be taken.
 - f. Contractor shall retype the punch list and distribute it within three working days to those attending the meeting.
 - g. If additional site visits by the Construction Manager, the Architect and the Architect's and District's consultants are required to review completion and correction of the Work, the costs of additional visits shall be reimbursed to the District by the Contractor by deducting such costs from the Final Payment.
- J. Correct items of work listed in Final Correction Punch List and comply with requirements for access to District-occupied areas.
- K. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
- 1. Architect's Certification of Substantial Completion:
 - a. When Architect determines that list of items to be completed and corrected (Punch List) is sufficiently complete for District to occupy Project for the use to which it is intended.
 - b. Architect will complete and issue to the District and Contractor a Certificate of Substantial Completion using:
 - 1) The American Institute of Architects Form G704 - Certificate of Substantial Completion
 - 2) or other form if directed by the District.
- L. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.16 FINAL PAYMENT

- A. After completion of all items listed for completion and correction, after submission of all documents and products and after final cleaning, submit final Application for Payment, identifying total adjusted Contract Sum, previous payments and sum remaining due.
- B. Payment will not be made until the following are accomplished:
 - 1. All Project Record Documents have been transferred and accepted by District.
 - 2. All extra materials and maintenance stock have been transferred and received by District.
 - 3. All warranty documents and operation and maintenance data have been received and accepted by District.
 - 4. All liens have been released or bonded by Contractor.
 - 5. Contractor's surety has consented to Final Payment.
 - 6. All documentation required by DSA has been completed.

3.17 MAINTENANCE

- A. Provide service and maintenance of components indicated in specification sections.

- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the District.

END OF SECTION

SECTION 01 73 56

ALTERATION AND MODERNIZATION EXECUTION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Alteration and Modernization work consisting of necessary demolition, dismantling, cutting, removal and repair of designated existing work and installation of new work as indicated herein and specified in applicable technical sections of the Project Manual.

1.02 ALTERATIONS

- A. Regulatory Requirements:
 - 1. Demolition work shall conform to:
 - a. California Fire Code, Chapter 14, "Fire Safety During Construction and Demolition."
 - b. California Building Code Chapter 33 - "Safeguards During Construction" and Chapter 34 - "Existing Structures."
- B. Verification of Existing Conditions:
 - 1. Drawings show the existing conditions, as they are believed to exist. Examine the existing conditions prior to alterations to existing buildings as indicated.
 - 2. Verify, at the site, conditions affecting the work.
 - a. Obtain accurate field dimensions of related areas, spaces, openings, levels, and items of adjacent work.
 - b. Before commencing work, report to Architect in writing, discrepancies between drawings and specifications and actual field conditions.
 - c. Commencement of work constitutes acceptance of all adjacent conditions affecting work of the section involved.
 - 3. Information provided represents to the best of the District's knowledge, conditions and materials to be found in this project.
 - a. The District assumes no responsibility whatsoever in respect to the sufficiency or accuracy of the Drawings or interpretation thereof.
 - b. There is no warranty or guarantee, either expressed or implied, that conditions and locations indicated are representative of those existing throughout the existing structures or that unforeseen developments may not occur.
- C. Continued Occupancy: Comply with Section 01 10 00 - Summary.
 - 1. District will continuously occupy buildings adjacent to areas of demolition operations. Conduct demolition operations in a manner that will minimize need for disruption of District's normal operations.
 - 2. Provide minimum 3 working days advance notice to District of demolition activities which might severely impact District's operations.
- D. Protection of Property, Public, Occupants (when applicable) and Workmen: Comply with 02 41 00 - Demolition.

1. Portions of existing structures where existing work is to be demolished or removed, and where new work is to be done, connections made, materials handled or equipment moved and related, shall be temporarily protected prior to start of demolition.
 2. Temporary protection shall be such that interior of existing structures will at all time be protected from dust fumes, smoke and weather inclemency. Comply with 01 50 00 - Temporary Facilities and Controls.
 3. Protect temporary openings in exterior walls by temporary weatherproof plywood closures. Comply with 01 50 00 - Temporary Facilities and Controls.
 4. Contractor will be held responsible for damage to existing structures and contents by reason of insufficiency of such protection. Comply with 01 40 00 - Quality Requirements
 5. Provide barricades, and maintenance and supervision thereof, in accordance with applicable Federal, State and local codes and their respective requirements, or as may be directed from time to time. Comply with 01 50 00 - Temporary Facilities and Controls.
- E. Transitions to Existing Work: Comply with 01 70 00 - Execution and Closeout Requirements.
1. Where alterations occur or new and old work are joined, immediately adjacent surfaces that are involved shall be cut, removed, patched, repaired or refinished, and left in as good condition as existed before commencing work.
 - a. Materials and workmanship employed in alterations involving new construction, unless otherwise indicated or specified, shall conform to no less than that of original work.
 2. Where remaining existing materials interfere with installation of new work, remove existing materials. After installation of new work is complete, or in conjunction with installation of new work as applicable, reinstall existing materials, patch and refinish, or provide new to match existing.
- F. Relocation of Existing Materials and Equipment: Comply with 01 70 00 - Execution and Closeout Requirements.
1. Relocate certain materials and equipment only as indicated or specified. Refinish certain existing surfaces as specified in applicable technical sections.
 2. Repair and refinish relocated materials and equipment as necessary to leave finished work in good condition.
- G. Salvage: Comply with 01 70 00 - Execution and Closeout Requirements and 02 41 00 - Demolition.
1. Salvaged materials occurring from work demolished or removed become property of Contractor unless otherwise noted in the Project Manual or Drawings to remain property of District, and shall be removed from project site.
 2. Exceptions:
 - a. Existing materials or equipment may be removed by District at any time prior to start of work.
 - b. Do not reuse in this project, materials and items removed from existing site or buildings, except with specific written approval by the Architect in each case, unless such removed material or item is specifically indicated or specified to be reused.
 - c. Remove materials and equipment indicated to be salvaged for reinstallation and store to prevent damage, and reinstall as the work progresses.

- 1) Do not reuse in this project, other materials and equipment removed from existing site or building, except with specific written approval by the Architect in each case.
 - d. Dismantled materials and items indicated to be reused must be in good condition without objectionable cracks, chips, splits, checks, dents, scratches, or other defects.
 - 1) Operating items shall operate properly.
 - 2) Notify Architect immediately of items found to be to the contrary.
 - e. Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets and similar items remain the property of the District.
 - 1) Notify District if such items are encountered and obtain acceptance regarding method of removal and salvage.
- H. Submittals: Demolition Plan per 02 41 00 - Demolition.
1. Before commencing alteration, removal and demolition work, prepare and submit for review by District, a schedule showing commencement, order and completion dates of various parts of work, including utilities disruptions and proposal to ensure uninterrupted progress of District's on-site operations.
- I. Utilities: Comply with 02 41 00 - Demolition.
1. Before starting work relating to existing utilities (electrical, sewer, water, heat, gas, fire lines, etc.), that will temporarily discontinue or disrupt service to existing buildings, provide two (2) working days notice to utility company, Architect and District, and obtain their approval in writing before proceed with this phase of Work.
 2. Disconnect, remove, and cap designated utility services, or those utility services required to be altered, within demolition areas.
 3. Mark locations of disconnected utilities. Identify and indicate capping locations on project record drawings.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR NEW WORK

- A. Comply with 01 60 00 - Product Requirements
- B. Products for New Work: Products specified in Part 2 - PRODUCTS of applicable technical sections of the Project Manual, shall be utilized for patching and extending Work.
- C. Type and Quality of Existing Products: Determine by inspection and testing Products where necessary, referring to existing construction as a standard.

PART 3 - EXECUTION

3.01 DEMOLITION

- A. Comply with 02 41 00 - Demolition.
- B. Conduct demolition to minimize interference with building or exterior areas to remain used or occupied, and surrounding landscaped areas.
 1. Maintain protected egress and access at all times.

- C. Demolish in an orderly and careful manner.
 - 1. Protect existing and remaining foundations and structural members.
 - 2. Perform cutting, drilling and removal of existing work with extreme care, with small tools in order not to jeopardize structural integrity of building or its parts. See also Section 01 70 00 - Execution and Closeout Requirements

3.02 MODERNIZATION

- A. The following is an expansion of some of the main reconstruction notes and specifications used on this project, and apply where and whenever described work is required.
- B. Concrete Floor or Slab:
 - 1. Repair existing concrete floor.
 - a. Fill cracks and voids with epoxy mortar per 03 01 00 - Maintenance of Concrete and 03 30 00 - Cast-in-Place Concrete.
 - b. Paint per 09 91 23 - Interior Painting, at existing painted floors and where scheduled to receive paint.
 - 2. Replacement of concrete slabs:
 - a. Use normal methods that will not crack or structurally disturb adjacent walls, partitions or slabs. Use power saws where possible.
- C. Concrete and Masonry: Comply with 01 70 00 - Execution and Closeout Requirements
 - 1. Demolish concrete and masonry in small sections.
 - a. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
 - b. Saw concrete along straight lines to a depth of not less than 1-1/2 inches.
 - c. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face.
 - d. Break out the remainder of the concrete or masonry provided that the broken area is concealed in the finished work, and the remaining concrete or masonry is sound.
 - e. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete or masonry.
 - 2. Remove anchorages to at least 1/2-inch below the surface of concrete or masonry and patch depressions to provide a flush surface. Comply with 03 01 00 - Maintenance of Concrete.
 - a. Where surface will be concealed in the finished work, anchors may be cut flush with the surface.
- D. Cabinets, Countertops and Casework: Comply with 06 20 00 - Finish Carpentry, 06 41 00 - Architectural Wood Casework, and 12 35 53.19 - Wood Laboratory Casework.
 - 1. Provide new plastic laminated top (over existing cabinet), where indicated:
 - a. Remove existing countertop and splash.
 - b. Provide new countertop and splash per Section 12 35 53.19 - Wood Laboratory Casework, and attach to existing cabinet conforming to the requirements of Architectural Woodwork Standards, second edition.
 - c. Provide clearances for accessibility compliance where indicated.

- 1) If it results in a lower cost or no additional cost for the District; With District approval, remove cabinet and provide new to match existing.
2. Refinish, prep, and repaint existing cabinets and shelves:
 - a. Prepare cabinet surfaces for refinishing to match existing.
 - b. Fill and sand smooth holes, scratches and voids.
 - c. Where accessibility compliance is required, modify existing cabinets accordingly.
 - 1) If it results in a lower cost or no additional cost for the District; With District approval, remove cabinet and provide new to match existing.
 - d. Replace missing or damaged beyond repair existing cabinet hardware with new hardware to match existing. Verify all existing hardware is functioning properly.
3. New cabinets with or without sinks:
 - a. Provide new cabinets per Section 06 41 00 - Architectural Wood Casework and 12 35 53.19 - Wood Laboratory Casework
 - b. Provide sink (where indicated) in cabinet with all rough and finish plumbing as scheduled on Drawings and as required in Division 22.
 - c. Provide clearances for accessibility compliance where indicated.
4. New shelves:
 - a. Provide new shelves per Drawings and Section 06 41 00 - Architectural Wood Casework.
 - b. Prepare and refinish shelves.
- E. Roof: Comply with 070150.20 - Roofing Restoration Patch and Repair.
 1. Patch and repair existing roof where indicated on Drawings.
- F. Walls and Partitions:
 1. Interior Partitions:
 - a. Remove partitions including finish, studs, plates and sills.
 - b. Where only a partial run is removed, cut back the finish material to the centerline of the next adjacent support to remain.
 - c. Leave remaining material with a clean terminal line with no loose adhering material. Where partitions have been installed on curbs, remove curbs and patch existing floor to receive new finish.
 2. Clean, patch and paint exposed walls, trims, columns, window frames, doors and door frames:
 - a. Painting shall include all surfaces and materials between the floor and the finish ceiling.
 - 1) Exceptions:
 - (a) Window glazing
 - (b) Anodized or other new pre-finished metal
 - (c) Vinyl wall covering
 - (d) Mechanical and electrical equipment
 - (e) Cabinets of stained finish and plastic laminate.
 - b. Prepare and patch existing gypsum wall board per Section 09 21 16 - Gypsum Board Assemblies.

3. Gypsum board:
 - a. Cut back gypsum board to the centerline of the next adjacent support to remain. Leave remaining material with a clean terminal line with no loose adhering material.
 4. Prepare and patch existing plaster (where present) per 09 24 00 - Portland Cement Plaster.
 - a. Smooth/patch existing plaster walls:
 - 1) Cut existing plaster back to sound plaster on straight lines. Repair existing underlayment and metal lath for proper overlapping in shingle fashion to receive new plaster.
 - (a) See Drawings for additional details.
 - 2) Patch existing plaster with same type of plaster (gypsum or cement) where reconstruction work occurs.
 - 3) Plaster patching shall meet flush and match surrounding existing plaster texture.
 5. New tile backer cement board and new ceramic tile wainscot:
 - a. Conform to 09 21 16 - Gypsum Board Assemblies for installation of tile backer board.
 - b. Conform to 09 30 00 - Tiling for installation of new ceramic tile.
 6. Paint per 09 91 13 - Exterior Painting and 09 91 23 - Interior Painting.
- G. Openings:
1. Doors: Comply with 08 11 13 - Hollow Metal Doors and Frames, 08 14 16 - Flush Wood Doors, 08 71 00 - Door Hardware, 09 91 13 - Exterior Painting, 09 91 23 - Interior Painting, and 09 96 00 - High-Performance Coatings
 - a. Re-Use of Existing Doors:
 - 1) Existing doors indicated to re-used, provide new hardware per District Standards.
 - 2) Remove door from frame, label door with the door number as indicated in the Drawings at the bottom sill edge of the door panel.
 - 3) Where doors are indicated to be re-used in the new work, leave hardware attached to the door.
 - (a) Where this is not practical, place items of hardware in a labeled cloth bag attached to the door. Protect for re-installation.
 - 4) Stack removed doors in a method to protect from damage.
 - 5) When ready for re-installation see paragraph below for refinish of existing doors.
 - b. New door frame, door and hardware:
 - 1) Remove existing door, frame, wall section and other existing construction in order to install new door and frame.
 - 2) Construct new filler wall where required.
 - (a) Interior and exterior wall finishes to meet flush and match existing adjacent wall materials in type, texture and color.
 - (b) Frame new filler wall using materials to match existing, unless indicated otherwise.

- (c) Provide secure, rigid head and jamb framing members to receive new door frames.
 - 3) Provide new frames per Specifications and Drawings.
 - 4) Provide new doors per Specifications and Drawings.
 - (a) Match door finish (paint or natural/stained) with existing doors to remain in the building/room.
 - 5) Prepare and paint or natural / stained finish doors and frames per Section 09 91 13 - Exterior Painting, 09 91 23 - Interior Painting, and 09 96 00 - High-Performance Coatings.
 - 6) Provide new door hardware as indicated on Drawings and 08 71 00 - Door Hardware.
 - 7) Relocate light switch where door opening is enlarged to fit new door.
 - c. New doors to replace existing (including new hardware):
 - 1) Remove existing door and hardware.
 - 2) Field verify existing clear opening dimension.
 - 3) Patch, fill and sand smooth holes in wood frames where old hardware has been removed. Position new hardware such as to avoid old locations and holes.
 - 4) At existing metal frames to remain, use new hinges to match hole mounting.
 - 5) Provide new door to fit in existing openings.
 - 6) Provide new door hardware per 08 71 00 - Door Hardware.
 - 7) Prepare and paint or natural / stained finish new doors and frames.
 - d. Refinish existing doors:
 - 1) If existing wood door is natural/stained:
 - (a) Remove hardware.
 - (b) Strip existing finish entirely from all exposed surfaces and prepare for new clear or stained wood finish per 08 14 16 - Flush Wood Doors.
 - (c) Repair damaged portions of door.
 - (1) Fill and sand smooth all holes, voids and repairs.
 - (2) Fill Material: Match exposed existing wood color when finished.
 - (d) Finish existing, stripped and prepared door.
 - (e) Replace/reinstall hardware.
 - 2) If existing wood door is painted:
 - (a) Remove hardware.
 - (b) Prepare all door surfaces for painting.
 - (c) Repair damaged portion of door.
 - (1) Fill and sand smooth all holes, voids and repairs.
 - (d) Paint existing, prepared door.
 - (e) Replace/reinstall hardware.
- H. Glazing: 08 11 13 - Hollow Metal Doors and Frames, 08 80 00 - Glazing, 09 91 13 - Exterior Painting, and 09 91 23 - Interior Painting
 - 1. Replace existing glass panes with new glass:
 - a. Remove existing glass or acrylic glazing where indicated and provide new glass as specified.

- b. Prepare and paint window frames as specified for the specific type of window frame.
2. Refurbish existing windows:
 - a. Steel windows:
 - 1) Scrape, and wire brush clean, steel frames and sash.
 - (a) Remove rust, scale, dirt, grease and paint in preparation for new paint.
 - 2) Repair damaged or broken frames or sash.
 - (a) Weld and grind smooth or replace broken steel members.
 - 3) Tighten and otherwise secure loose bolts, screws or other connectors.
 - (a) Steel sash shall move freely and easily in steel frames when work is complete.
 - 4) Clean, repair and lubricate window hardware.
 - (a) Replace damaged components which cannot be repaired.
 - (b) Window hardware shall be in good working order when work is complete.
 - 5) Paint steel window components.
 - 6) Clean existing glazing following manufacturers' instructions for specific type of glazing.
 - b. Wood Windows and Frames: Comply with 06 20 00 - Finish Carpentry, 09 91 13 - Exterior Painting, and 09 91 23 - Interior Painting.
 - 1) Prepare wood window frames and sash for painting or stain.
 - 2) Repair or replace damaged or broken portion of frame or sash.
 - (a) Fill and sand smooth all holes, voids and repairs.
 - 3) Paint existing prepared wood frames and sash.
 - 4) Clean, repair and lubricate window hardware.
 - (a) Replace damaged components which cannot be repaired.
 - (b) Window hardware shall be in good working order when work is complete.
 - 5) Clean existing glazing following manufacturers' instruction for the specific type of glazing.
- I. Finishes:
 1. Ceramic tile: Comply with 09 30 00 - Tiling.
 - a. New Ceramic Tile:
 - 1) Remove tile back to next full unit beyond the removal line.
 - 2) Saw cut setting bed at line to remain.
 - 3) Remove individual damaged tile and backing mortar as required to provide for installation of new tile within the specified tolerances.
 - b. Remove existing finish floor to receive new ceramic tile floor.
 - c. Provide new slip resistant ceramic tile floor and base .
 - d. Steam clean all existing ceramic tile surfaces, where indicated to remain:
 - 1) Clean and seal existing ceramic tile.
 2. New suspended ceiling systems: Comply with 09 51 00 - Acoustical Ceilings.
 - a. Remove existing ceiling materials where interfacing with the installation of new ceiling. Remove back to next full unit beyond removal line.
 - b. Remove individual panels where required for new light fixtures.
 - c. Store and protect units suitable for re-installation where indicated.

- d. Install new ceiling.
- 3. New Resilient Flooring and Rubber Base: Comply with 09 65 00 - Resilient Flooring.
 - a. Prepare floor in compliance with 09 05 61 - Common Work Results for Flooring Preparation.
 - b. Install new resilient tile flooring over existing concrete floor.
 - 1) Remove existing carpet or resilient floor finish, including adhesives.
 - c. Remove existing wood, rubber or vinyl base and mastic, patch and repair wall prior to installation of new base.
 - 1) Remove existing plaster grounds behind removed base and provide in-fill plaster finish; flush and smooth to receive new base.
 - d. Patching exposed above new base shall be finished to match surrounding wall.
 - e. Provide new topset base to match or existing as applicable.
- 4. New carpet and base: Comply with 09 68 16 - Sheet Carpeting, 09 68 13 - Tile Carpeting, and 09 65 00 - Resilient Flooring
 - a. Remove existing carpet, carpet mastic, edging strips and accessories, and thoroughly clean existing substrate.
 - b. Existing vinyl flooring is to remain beneath carpet to remain, unless noted otherwise.
 - c. Patch existing substrate (vinyl tile, concrete, etc.).
 - d. Provide new carpet and base.
- 5. New fabric covered tack paneling: Comply with 10 11 00 - Visual Display Units, 10 11 23.13 - Fixed Tackboards, and 10 11 24 - Tackable Wall Systems.
 - a. Remove from wall existing conflicting surface treatment: trim, shelving, boards, electrical / mechanical devices etc.
 - b. Patch wall prior to installation of new tack paneling.
 - c. Provide new tack paneling.
 - d. Adjust existing recessed outlets and switches to be flush with tack panel.
- 6. Patch, clean and paint existing ceiling: Comply with 09 21 16 - Gypsum Board Assemblies, 09 24 00 - Portland Cement Plaster, and 09 91 23 - Interior Painting
 - a. Patch, clean and paint existing plaster ceiling or soffit.
 - b. Patch, clean and paint existing gypsum board ceiling or soffit
 - c. At existing acoustic tile ceilings, replace only damaged tiles when indicated, clean and paint entire ceiling.
 - d. Paint.
- J. Accessories and Components:
 - 1. New markerboards and tackboards: Comply with 10 11 00 - Visual Display Units.
 - a. Remove from wall existing conflicting surface treatment: Trim, shelving, boards, etc. Patch wall prior to installation of new boards.
 - b. Provide new markerboards and tackboards.
 - 2. New toilet compartments: Comply with 10 21 13.19 - Plastic Toilet Compartments.
 - a. Remove existing toilet compartments.
 - 1) Patch walls, floor and ceiling as required elsewhere in these notes.

- b. Provide solid blocking or backing plates in existing walls.
 - c. Provide new toilet compartments
- 3. New signage: Comply with 10 14 00 - Signage and 101453 - Traffic, Parking and Site Signage.
 - a. Provide interior and exterior signage as indicated on Drawings.
- 4. New toilet accessories: Comply with 10 28 00 - Toilet Accessories.
 - a. Remove existing toilet accessories.
 - b. Provide backing plates or blocking in existing walls as indicated and/or specified, and patch walls.
 - c. Provide new toilet accessories as scheduled on Drawings and as specified in 10 28 00 - Toilet Accessories.
- 5. New fire extinguisher cabinets: Comply with 10 44 00 - Fire Protection Specialties.
 - a. Remove existing fire extinguisher cabinets as indicated and patch walls flush, in preparation for new semi-recessed cabinets complete with fire extinguisher.

3.03 EXAMINATION

- A. Verify that demolition is complete, and areas are ready for execution of Work.
- B. Beginning of restoration Work will be interpreted to mean acceptance of existing conditions.

3.04 PREPARATION

- A. Cut, move or remove items as necessary for access for alterations, renovation and extension Work. Replace and restore at completion.
- B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- C. Remove debris and abandoned items from area from concealed spaces.
- D. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.
- E. Close openings in exterior surfaces to protect existing work, and salvage items where applicable, from weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.

3.05 INSTALLATION

- A. Coordinate Work for alterations and renovations to expedite completion sequentially and to accommodate District occupancy.
- B. Designated areas: Complete in all respects including operational mechanical and electrical work.
- C. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring products and finishes to original or specified condition, including finish paint on exterior. Refer to Section 01 70 00 - Execution and Closeout Requirements.
- D. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.

- E. In addition to specified replacement of equipment and fixtures, restore existing and remaining plumbing, heating, ventilation, air conditioning, and electrical systems to full operational conditions.
- F. Install Products as specified in applicable Sections.

3.06 TRANSITIONS

- A. Where Work abuts or aligns with existing construction, perform a smooth and even transition. Patches shall match existing adjacent construction in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition is not possible, terminate existing surface along a straight line at a natural line of division. Refer to Section 01 70 00 - Execution and Closeout Requirements.
- C. Where a waterproofing system is interrupted, leave sufficient material to allow for overlapping of new material over or behind existing maintaining a watertight installation.

3.07 ADJUSTMENTS

- A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
- B. Where a change of plane of 1/4 inch or more occurs, submit recommendation for providing a smooth transition for Architect's review.
- C. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.
- D. Fit work at penetrations of surfaces as specified in Section 01 70 00 - Execution and Closeout Requirements.

3.08 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Repair substrate prior to patching finish.

3.09 FINISHES

- A. Finish surfaces as specified in applicable Sections.
- B. Finish patches to produce uniform finish and texture over entire area.
 - 1. When finish cannot be matched, refinish entire surface to nearest intersections.

3.10 CLEANING

- A. In addition to cleaning specified in section 01 70 00 - Execution and Closeout Requirements, clean District-occupied areas of existing construction affected by construction activities.
- B. Do not burn or bury materials on site.

3.11 DEMOLITION RESTRICTIONS

- A. Noise Abatement:
 - 1. Limit noise to a reasonable level as related to specific items of equipment used and their hours of use.

2. This does not preclude use of mechanical equipment, i.e. jack hammers, power-driven fasteners.
- B. Do not operate air compressors inside of existing buildings.
- C. Drilling or cutting of columns, beams, joists, girders, or other structural support elements not permitted, unless specifically approved by Architect.

3.12 DISPOSAL OF DEMOLISHED MATERIALS

- A. Do not burn or bury materials on site.
- B. Immediately remove demolished materials from site or stockpile where directed if designated for re-use.
- C. Remove and promptly dispose of contaminated, vermin infested, or dangerous materials encountered.
- D. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.

END OF SECTION

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

- A. Comply with the requirements Section 5.408 of the California Green Building Standards Code.
 - 1. Recycle and/or salvage for reuse a minimum of 65percent of the nonhazardous construction and demolition waste in accordance with Section 504.8.1.1, 5.408.1.2, or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent.
- B. District requires that this project generate the least amount of trash and waste possible.
- C. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- D. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- E. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
 - 1. Aluminum and plastic beverage containers.
 - 2. Corrugated cardboard.
 - 3. Wood pallets.
 - 4. Clean dimensional wood.
 - 5. Concrete: May be crushed and used as riprap, aggregate, sub-base material, or fill.
 - 6. Bricks: May be used on project if whole, or crushed and used as landscape cover, sub-base material, or fill.
 - 7. Concrete masonry units: May be used on project if whole, or crushed and used as sub-base material or fill.
 - 8. Asphalt paving: May be recycled into paving for project.
 - 9. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
 - 10. Glass.
 - 11. Gypsum drywall and plaster.
 - 12. Carpet, carpet cushion, carpet tile, and carpet remnants, both new and removed: DuPont (<http://flooring.dupont.com>) and Interface (www.interfaceinc.com) conduct reclamation programs.
 - 13. Roofing.
 - 14. Paint.
 - 15. Plastic sheeting.
 - 16. Rigid foam insulation.

17. Windows, doors, and door hardware.
18. Plumbing fixtures.
19. Mechanical and electrical equipment.
20. Fluorescent lamps (light bulbs).
21. Acoustical ceiling tile and panels.
22. Materials which could be hazardous and subject to special disposal regulations include but are not limited to the following: CalGreen Section 5.408.2
 - a. Lead-Based Paint
 - b. Asbestos: Found in older pipe insulation, asphalt floor tiles, linoleum, insulation, etc.
 - c. Polychlorinated Biphenyls (PCBs):
 - 1) Found in electrical oil filled equipment manufactured prior to 1978 such as transformers, switches and fluorescent lamp ballasts.
 - 2) Also found in adhesive, sealant, caulk, glazing putty, roofing material, pesticide vehicle, ink, paper, fabric dye, gaskets, and hydraulic fluid.
 - d. HVAC Refrigerants: Containing Fluorinated and Chlorinated compounds.
 - e. Drinking Fountain Refrigerants: Containing Fluorinated and Chlorinated compounds.
 - f. Fluorescent Light Tubes: Contain mercury.
 - g. EXIT signs and Smoke Detectors: May contain unregulated, radioactive tritium. Required to be returned to manufacturer.
 - h. Contaminated Soils.
 - i. Pressure Treated Lumber.
- F. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.
 1. Contractor's quantitative reports for construction waste materials as a condition of approval of progress payments.
- G. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements. CalGreen Section 5.408.1.1.
- H. The following sources may be useful in developing the Waste Management Plan:
 1. California Recycling Department, at www.bsc.ca.gov/Home/CALGreen.aspx.
 2. General information contacts regarding construction and demolition waste:
 - a. EPA Construction and demolition (C&D) debris website: www.epa.gov/epawaste/conserves/imr/cdm/.
 - b. Directory of Wood-Framed Building Deconstruction and Reused Building Materials Companies: www.fpl.fs.fed.us/documnts/fplgtr/fpl_gtr150.pdf.
 - c. Additional resources to be developed by Contractor with assistance from District and Contractor, as requested.
 3. Recycling Haulers and Markets: The source list below contains local haulers and markets for recyclable materials. This list is provided for information only and is not necessarily comprehensive; other haulers and markets are acceptable.
 - a. CAL-MAX: www.calrecycle.ca.gov/calmax/.

- 1) A free service designed to help businesses find markets for non-hazardous materials they have traditionally discarded.
- b. General Recycling/Reuse Centers: For information on qualified local solid waste haulers contact the California Department of Resources Recycling and Recovery - CalRecycle. The website lists wastes recycling facilities in counties throughout the State of California.
 - 1) <http://www.calrecycle.ca.gov/default.asp>
- I. Methods of trash/waste disposal that are not acceptable are:
 1. Burning on the project site.
 2. Burying on the project site.
 3. Dumping or burying on other property, public or private.
 4. Other illegal dumping or burying.
 5. Incineration, either on- or off-site.
- J. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
 1. Debris that is not hazardous as defined in CalGreen Section 5.408.2 and California Code of Regulations, Title 22, Section 66261.3 et seq.
 2. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel.
 3. The debris may be commingled with rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Diversion: Avoidance of demolition and construction waste sent to landfill or incineration. Diversion does not include using materials for landfill, alternate daily cover on landfills, or materials used as fuel in waste-to-energy processes.
- E. Enforcement Agency (EA). Enforcement agency as defined in CA Public Resources Code 40130.
- F. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- G. Landfill, Inert waste or Inert Disposal Facility:

1. A disposal facility that accepts only inert waste such as soil and rock, fully cured asphalt paving, uncontaminated concrete (including fiberglass or steel reinforcing rods embedded in the concrete), brick, glass, and ceramics, for land disposal.
- H. Landfill, Class III:
1. A landfill that accepts non-hazardous resources such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations.
 2. A Class III landfill must have a solid waste facilities permit from the California Integrated Waste Management Board (CIWMB) and is regulated by the Enforcement Agency (EA).
- I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- J. Mixed Debris Recycling Facility: A processing facility that accepts loads of commingled construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing the non-recyclable residual materials.
- K. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- L. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- M. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- N. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- O. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- P. Recycling Center: A facility that receives only C&D material that has been separated for reuse prior to receipt, in which the residual (disposed) amount of waste in the material is less than 10% of the amount separated for reuse by weight.
- Q. Return: To give back reusable items or unused products to vendors for credit.
- R. Reuse: To reuse a construction waste material in some manner on the project site.
- S. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- T. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- U. Separated for Reuse:
1. Materials, including commingled recyclables.
 2. Separated or kept separate from the solid waste stream for the purpose of:
 - a. Additional sorting or processing those materials for reuse or recycling.
 - 1) In order to return them to the economic mainstream in the form of raw material for new, reused, or reconstituted products.
 - b. Products shall meet the quality standards necessary to be used in the marketplace.

- c. Includes materials that have been “source separated”.
- V. Solid Waste:
 - 1. All putrescible and nonputrescible solid, semisolid, and liquid wastes, including:
 - a. Garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes.
 - b. Abandoned vehicles and parts thereof.
 - c. Discarded home and industrial appliances.
 - d. Dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste.
 - e. Manure, vegetable or animal solid and semisolid wastes.
 - f. Other discarded solid and semisolid wastes.
 - 2. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.
- W. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
 - 1. Materials, including commingled recyclables, that have been separated or kept separate from the solid waste stream at the point of generation, for the purpose of additional sorting or processing of those materials for reuse or recycling in order to return them to the economic mainstream in the form of raw materials for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.
- X. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- Y. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- Z. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.
- AA. Waste Hauler: A company that possesses a valid permit from the local waste management authority to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal in the locality.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Submit Waste Management Plan within 30 calendar days after receipt of Notice to Proceed, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to landfilling.
 - 1. Submit four copies of CWMP for review.
 - a. Contractor's Construction Waste and Recycling Plan must be approved by the Architect and Construction Manager prior to the start of Work.
 - 2. Approval of the Contractor's CWMP shall not relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures.
- C. Waste Management Plan: Include the following information:
 - 1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.

2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
 3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
 - a. List each material proposed to be salvaged, reused, or recycled.
 - b. List the local market for each material.
 4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
 5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
 6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.
 7. Recycling Incentives: Describe procedures required to obtain credits, rebates, or similar incentives.
- D. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
 - a. Inert materials shall achieve a construction waste diversion rate of at least 95 percent.
 - 1) These materials include, but are not limited to, concrete, asphalt and rock.
 - 2) Earthwork is not included.
 - 3) Excavated soil shall not be included in any of the calculations used to ensure compliance with this specification section.
 - b. The overall diversion rate must be based on weight.
 - c. The diversion rate of individual materials can be measured in either weight or volume, but the rate shall be converted into the units selected for calculating the overall diversion rate.
 - 1) All individual material diversions must be converted to a consistent set of units when calculating the overall diversion rate for the all reports and submittals required for the Work.
 - d. Conversion rate numbers shall be based on standard conversion rate data for construction projects provided by the California Integrated Waste Management Board (CIWMB). This data is available at the following internet location, <https://www.calrecycle.ca.gov/LGCentral/Library/Guidance/>.
 2. Submit Report on a form acceptable to District.
 3. Landfill Disposal: Include the following information:
 - a. Identification of material.

- b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
 - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
4. Recycled and Salvaged Materials: Include the following information for each:
- a. Identification of material, including those retrieved by installer for use on other projects.
 - b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
 - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
5. Material Reused on Project: Include the following information for each:
- a. Identification of material and how it was used in the project.
 - b. Amount, in tons or cubic yards.
 - c. Include weight tickets as evidence of quantity.
6. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 PRODUCTS

2.01 PRODUCT SUBSTITUTIONS

- A. See Section 01 60 00 - Product Requirements for substitution submission procedures.
- B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01 60 00:
 - 1. Relative amount of waste produced, compared to specified product.
 - 2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Sum.
 - 3. Proposed disposal method for waste product.
 - 4. Markets for recycled waste product.

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

- B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.
- C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.
- D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, District, and Architect.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Prebid meeting.
 - 2. Preconstruction meeting.
 - 3. Regular job-site meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
 - 1. As a minimum, provide:
 - a. Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.
 - b. Separate dumpsters for each category of recyclable.
 - c. Recycling bins at worker lunch area.
 - 2. Provide containers as required.
 - 3. Provide temporary enclosures around piles of separated materials to be recycled or salvaged.
 - 4. Provide materials for barriers and enclosures that are nonhazardous, recyclable, or reusable to the maximum extent possible; reuse project construction waste materials if possible.
 - 5. Locate enclosures out of the way of construction traffic.
 - 6. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 - 7. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
 - 8. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of

identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

3.03 DISPOSAL OPERATIONS AND WASTE HAULING

- A. Remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except for items or materials to be salvaged, recycled, or otherwise reused.
 - 2. Except as otherwise specified, do not allow waste materials that are to be disposed of to accumulate on site.
 - 3. Use a permitted waste hauler or Contractor's trucking services and personnel. To confirm valid permitted status of waste haulers, contact the local solid waste authority.
 - 4. Become familiar with the conditions for acceptance of new construction, excavation and demolition materials at recycling facilities, prior to delivering materials.
 - 5. Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.
 - 6. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 7. Do not burn or bury waste materials on or off site. Appropriate on-site topical application of ground gypsum or wood, or use of site paving as granulated fill is considered reuse, not waste.

3.04 PLAN AND REPORT FORMS

- A. See suggested forms on the following pages.

END OF SECTION

CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN

(Submit After Award of Contract and Prior to Start of Work)

Project Title:						
Contract or Work Order No.:						
Contractor's Name:						
Street Address:						
City:			State:		Zip:	
Phone: ()			Fax: ()			
E-Mail Address:						
Prepared by: (Print Name)						
Date Submitted:						
Project Period: From: TO:						
Reuse, Recycling or Disposal Processes To Be Used						
Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:						
01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)						
02 - Salvaging building materials or salvage items at an offsite salvage or re-use center (i.e. lighting, fixtures)						
03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)						
04 - Recycling source separated materials at an offsite recycling center (i.e. scrap metal or green materials)						
05 - Recycling commingled loads of C&D materials at an offsite mixed debris recycling center or transfer station						
06 - Recycling material as Alternative Daily Cover at landfills						
07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).						
08 - Disposal at a landfill or transfer station.						
09 - Other (please describe) _____						
Types of Material To Be Generated						
Use these codes to indicate the types of material that will be generated on the project						
A = Asphalt C = Concrete M = Metals I = Mixed Inert G = Green Materials						
D = Drywall P/C=Paper/Cardboard W/C = Wire/Cable S= Soils (Non Hazardous)						
M/C = Miscellaneous Construction Debris R = Reuse/Salvage W = Wood O = Other (describe)						
Facilities Used: Provide Name of Facility and Location (City)						
Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period						
Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).						
SECTION I - RE-USED/RECYCLED MATERIALS						
Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.						
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, Los Angeles	24	355		
a. Total Diversion						

CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN

Continued

SECTION II - DISPOSED MATERIALS						
Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling will occur.						
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal				0	0	0

SECTION III - TOTAL MATERIALS GENERATED			
This section calculates the total materials to be generated during the project period (Reuse/Recycle + Disposal = Generation)			
	Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled	0	0	0
b. Total Disposed	0	0	0
c. Total Generated	0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION			
Add totals from Section I + Section II			
	Tons	Cubic YD	Other Wt.
a. Materials Re-Used and Recycled	0		
b. Materials Disposed	0		
c. Total Materials Generated (a. + b. = c.)	0	0	0
d. Landfill Diversion Rate (Tonnage Only)*			

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

- Notes:
- | | |
|--|--|
| 1. Suggested Conversion Factors: From Cubic Yards to Tons
(Use when scales are not available) | c. Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons) |
| a. Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt) | d. Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons) |
| b. Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete) | e. Drywall Scrap: .20 |
| | f. Wood Scrap: .16 |

CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT

(Submit With Each Progress Payment)

Project Title:						
Contract or Work Order No.:						
Contractor's Name:						
Street Address:						
City:			State:		Zip:	
Phone: ()			Fax: ()			
E-Mail Address:						
Prepared by: (Print Name)						
Date Submitted:						
Project Period: From: TO:						
Reuse, Recycling or Disposal Processes to Be Used						
Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:						
01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)						
02 - Salvaging building materials or salvage items at an offsite salvage or re-use center (i.e. lighting, fixtures)						
03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)						
04 - Recycling source separated materials at an offsite recycling center (i.e. scrap metal or green materials)						
05 - Recycling commingled loads of C&D materials at an offsite mixed debris recycling center or transfer station						
06 - Recycling material as Alternative Daily Cover at landfills						
07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).						
08 - Disposal at a landfill or transfer station.						
09 - Other (please describe) _____						
Types of Material To Be Generated						
Use these codes to indicate the types of material that will be generated on the project						
A = Asphalt C = Concrete M = Metals I = Mixed Inert G = Green Materials						
D = Drywall P/C=Paper/Cardboard W/C = Wire/Cable S= Soils (Non-Hazardous)						
M/C = Miscellaneous Construction Debris R = Reuse/Salvage W = Wood O = Other (describe)						
Facilities Used: Provide Name of Facility and Location (City)						
Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period						
Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).						
SECTION I - RE-USED/RECYCLED MATERIALS						
Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.						
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, Los Angeles	24	355		
a. Total Diversion						

CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT

Continued

SECTION II - DISPOSED MATERIALS						
Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling will occur.						
Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities		
				Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles	2	35		
b. Total Disposal						

SECTION III - TOTAL MATERIALS GENERATED			
This section calculates the total materials to be generated during the project period (Reuse/Recycle + Disposal = Generation)			
	Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled			
b. Total Disposed			
c. Total Generated			

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION			
Add totals from Section I + Section II			
	Tons	Cubic YD	Other Wt.
a. Materials Re-Used and Recycled			
b. Materials Disposed			
c. Total Materials Generated (a. + b. = c.)			
d. Landfill Diversion Rate (Tonnage Only)*			

* Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

- Notes:
- | | |
|--|--|
| 1. Suggested Conversion Factors: From Cubic Yards to Tons
(Use when scales are not available) | c. Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons) |
| a. Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt) | d. Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons) |
| b. Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete) | e. Drywall Scrap: .20 |
| | f. Wood Scrap: .16 |

SECTION 01 76 10
TEMPORARY PROTECTIVE COVERINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary protective coverings for installed floors, walls, and other surfaces.

1.02 RELATED REQUIREMENTS

- A. Section 01 70 00 - Execution and Closeout Requirements: Coordination of requirements for materials specified in this section.

1.03 REFERENCE STANDARDS

- A. ANSI A135.4 - American National Standard for Basic Hardboard.
- B. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.
- E. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes available; and installation instructions.
- C. Shop Drawings: Indicate existing finished surfaces to be protected.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Temporary Protective Coverings:
 - 1. Fortifiber Building Systems Group: fortifiber.com.
 - 2. Protex Products: www.protex-products.com.
 - 3. Surface Shields, Inc: www.surfaceshields.com.
- B. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 GENERAL

- A. Provide materials that are easily removed without damage to the surfaces covered and with the following characteristics:
 - 1. Water resistant.
 - 2. Vapor permeable.
 - 3. Impact resistant.
 - 4. Slip resistant.

5. Flame retardant.

2.03 MATERIALS

A. Sheet Materials:

1. Corrugated polypropylene sheet.
2. Recycled paperboard/plastic composite sheet.
3. Recycled paperboard sheet.
4. Wood Hardboard: ANSI A135.4, tempered, 1/4 inch thick nominal.
5. Plywood, 1/2 inch thick nominal.
6. Fiberboard: ASTM C208, 1/2 inch thick nominal.
7. Water Vapor Permeability: Greater than 0.1 perms when tested in accordance with ASTM E96/E96M.
8. Flame Retardance: Meet requirements of NFPA 701.
9. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.

B. Rolled Materials:

1. Self-adhering polyethylene film.
2. Recycled cellulose fiberboard paper.
3. Laminated glass fiber reinforced kraft paper.
4. Rosin coated paper.
5. Water Vapor Permeability: Greater than 0.1 perms when tested in accordance with ASTM E96/E96M.
6. Flame Retardance: Meet requirements of NFPA 701.
7. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.

C. Corner and Door Jamb Protection Materials:

1. Cardboard, shaped specifically for application.
2. PVC plastic.

D. Tape: Type recommended by protective covering material manufacturer.

PART 3 EXECUTION

3.01 PREPARATION

- A. Remove dirt and debris from surfaces to be protected.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Trim or overlap sheet materials to fit area to be covered.
- C. Roll out and cut rolled materials to fit area to be covered.

- D. Tape seams. Avoid taping directly to finished surfaces.
- E. Stretch self-adhering film materials to completely cover surface.
- F. Install door jamb protection to full height of opening.
- G. Position corner protection 4 inches above finished floor to 96 inches high.

3.03 REMOVAL

- A. Remove protective coverings prior to Date of Substantial Completion. Reuse or recycle materials if possible.

END OF SECTION

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project record documents.
- B. Operation and maintenance data.
- C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

- A. Owner issued Bidding Instructions and General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 45 33 - Code-Required Special Inspections: Construction oversight procedures by DSA regarding the execution, approval, and closeout of this building project.
- D. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.
- E. Individual Product Sections: Specific requirements for operation and maintenance data.
- F. Individual Product Sections: Warranties required for specific products or Work.
 - 1. Special Project warranty requirements for specific products or elements of the Work; commitments and agreements for continuing services to District.

1.03 DEFINITIONS

- A. Warranty: Assurance to District by Contractor, installer, supplier, manufacturer or other party responsible as warrantor, for the quantity, quality, performance and other representations of a product, system service of the Work, in whole or in part, for the duration of the specified period of time.
- B. Guarantee: Assurance to District by Contractor or product manufacturer or other specified party, as guarantor, that the specified warranty will be fulfilled by the guarantor in the event of default by the warrantor.
- C. Standard Product Warranty: Preprinted, written warranty published by product manufacturer for particular products and specifically endorsed by the manufacturer to the District.
- D. Special Project Warranty: Written warranty required by or incorporated into Contract Documents, to extend time limits provided by standard warranty or to provide greater rights for District.
- E. Correction Period: As defined in the Conditions of the Contract, Correction Period shall be synonymous with "warranty period", "guarantee period" and similar terms used in the Contract Specifications.

1.04 SUBMITTALS

- A. Advance Submittals: For equipment and systems, or component parts of systems, put into service during construction and operated by District, submit documents within ten days of start of operation by District.
- B. Final Completion Submittals: Prior to application for final payment, Contractor shall submit 3 copies the following:
 - 1. Agency Document Submittals: Submit to District all documents required by authorities having jurisdiction, including serving utilities and other agencies. Submit original versions of all permit cards, with final sign-off by inspectors. Submit all certifications of inspections and tests.
 - a. Contractor shall also complete all required contractor forms and obtain DSA approval of these same forms. Comply with "Final Certification of Construction" per Title 24 Part 1 section 4-339.
 - 1) Form-6.C: Verified Report – Contractor: From each Contractor having a contract with the District.
 - 2. Final Specifications Submittals: Submit to District all documents and products required by Specifications to be submitted, including the following:
 - a. Project record drawings and specifications.
 - b. Operating and maintenance data.
 - c. Guarantees, warranties and bonds.
 - d. Keys and keying schedule.
 - e. Spare parts and extra stock.
 - f. Test reports and certificates of compliance.
 - 3. Certificates of Compliance and Test Report Submittals: Submit to District certificates and reports as specified and as required by authorities having jurisdiction, including the following:
 - a. Sterilization of water systems.
 - b. Sanitary sewer system tests.
 - c. Gas system tests.
 - d. Lighting, power and signal system tests.
 - e. Ventilation equipment and air balance tests.
 - f. Fire sprinkler system tests.
 - g. Fire detection system, smoke alarms and dampers.
 - h. Roofing inspections and tests.
 - 4. Lien and Bonding Company Releases: Submit to District, with copy to Architect, evidence of satisfaction of encumbrances on Project by completion and submission of The American Institute of Architects Forms:
 - a. G706 - Contractor's Affidavit of Payment of Debts and Claims;
 - b. G706A - Contractor's Affidavit of Release of Liens;
 - c. (if applicable) G707 - Consent of Surety;
 - d. or forms as as agreed to by the District.
 - e. Comply also with other requirements of District, as directed.

- f. All signatures shall be notarized.
- 5. Subcontractor List: Submit two copies to District and two copies to Architect of updated Subcontractor and Materials Supplier List.
- 6. Warranty Documents: Prepare and submit to District all warranties and bonds as specified in Contract General Conditions and this Section.
- C. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- D. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by District, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- E. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with District's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

1.05 WARRANTIES AND GUARANTEES

- A. General:
 - 1. Provide all warranties and guarantees with District named as beneficiary.
 - 2. For equipment and products, or components thereof, bearing a manufacturer's warranty or guarantee that extends for a period of time beyond the Contractor's warranty and guarantee, so state in the warranty or guarantee.
- B. Provisions for Special Warranties: Refer to Conditions of the Contract for terms of the Contractor's special warranty of workmanship and materials.
- C. General Warranty and Guarantee Requirements:
 - 1. Warranty shall be an agreement to repair or replace, without cost and undue hardship to District, Work performed under the Contract which is found to be defective during the Correction Period (warranty or guarantee) period.
 - 2. Repairs and replacements due to improper maintenance or operation, or due to normal wear, usage and weathering are excluded from warranty requirements unless otherwise specified.

- D. Specific Warranty and Guarantee Requirements: Specific requirements are included in product Specifications Sections of Divisions 03 through 33, including content and limitations.
- E. Disclaimers and Limitations:
 - 1. Manufacturer's disclaimers and limitations on product warranties and guarantees shall not relieve Contractor of responsibility for warranty and guarantee requirements.
 - 2. This applies to the Work that incorporates such products, nor shall they relieve suppliers, manufacturers, and installers required to countersign special warranties with Contractor.
- F. Related Damages and Losses: When correcting warranted Work that has been found defective, remove and replace other Work that has been damaged as a result of such defect or that must be removed and replaced to provide access for correction of warranted Work.
- G. Reinstatement of Warranty:
 - 1. When Work covered by a warranty has been found defective and has been corrected by replacement or rebuilding, reinstate the warranty by written endorsement.
 - 2. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- H. Replacement Cost:
 - 1. Upon determination that Work covered by a warranty has been found to be defective, replace or reconstruct the Work to a condition acceptable to District, complying with applicable requirements of the Contract Documents.
 - 2. Contractor shall be responsible for all costs for replacing or reconstructing defective Work regardless of whether District has benefited from use of the Work through a portion of its anticipated useful service life.
- I. District's Recourse:
 - 1. Written warranties made to the District shall be in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under law, nor shall warranty periods be interpreted as limitations on time in which the District can enforce such other duties, obligations, rights, or remedies.
 - 2. Rejection of Warranties:
 - a. The District reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- J. Warranty as Condition of Acceptance:
 - 1. District reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment shall be required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Record Documents are to be maintained and submitted in searchable live electronic format (PDF).
 - 1. Develop in compliance with Section 01 30 00 - Administrative Requirements.
 - 2. Acceptable markup software:
 - a. Adobe Acrobat Professional.
 - b. Bluebeam Revu.
- B. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Contract Drawings.
 - 2. Project Manual with Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- C. Ensure entries are complete and accurate, enabling future reference by District.
- D. Store record documents separate from documents used for construction.
- E. Record information concurrent with construction progress.
- F. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
 - 4. Provide copies of all approved addenda, directives, corrections, and change orders affecting the associated project.
 - a. These copies shall be included with the "Bid Set" and/or "Record Set" listed above and formatted as detailed above.
- G. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Reproducible set of Contract Drawings will be provided to Contractor by District through Architect or Construction Manager.
 - 2. Measured depths of foundations in relation to finish first floor datum.
 - 3. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

4. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
5. Field changes of dimension and detail.
6. Details not on original Contract drawings.
 - a. Application of copies of details produced and provided by Architect during construction will be accepted.
- H. Submission: Submit Record Documents in searchable (live text and redlines mark-ups; not scanned) PDF format to Architect prior to final Application for Payment.
 1. Maintain one additional paper copy and one in PDF format (on CD) of the fire suppression and fire protection detection system drawings and specifications at the building premises.
 - a. One copy is to be kept on site for a period of three years to comply with CFC section 901.6.2.

3.02 OPERATION AND MAINTENANCE DATA

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 1. Product data, with catalog number, size, composition, and color and texture designations.
 2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:

1. Description of unit or system, and component parts.
 2. Identify function, normal operating characteristics, and limiting conditions.
 3. Include performance curves, with engineering data and tests.
 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Include color coded wiring diagrams as installed.
- E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- G. Provide servicing and lubrication schedule, and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by controls manufacturer.
- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Provide control diagrams by controls manufacturer as installed.
- L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
1. Parts Data:
 - a. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams as necessary for service and maintenance.
 - b. Include complete nomenclature and catalog numbers for consumable and replacement parts.
 - c. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in stock by the District or operator.
- O. Include test and balancing reports.
- P. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Assemble operation and maintenance data into durable manuals for District's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

1. Provide duplicate electronic formatted (PDF) versions of the O&M binder for record purposes. Organize the same as the printed versions.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
- F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- J. Arrangement of Contents: Organize each volume in parts as follows:
 1. Project Directory.
 2. Table of Contents, of all volumes, and of this volume.
 3. Operation and Maintenance Data: Arranged by system, then by product category.
 - a. Source data.
 - b. Product data, shop drawings, and other submittals.
 - c. Operation and maintenance data.
 - d. Field quality control data.
 - e. Photocopies of warranties and bonds.
 4. Design Data: To allow for addition of design data furnished by Architect or others, provide a tab labeled "Design Data" and provide a binder large enough to allow for insertion of at least 20 pages of typed text.

3.06 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with District's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Project Warranty and Guarantee Forms:
 1. Example forms for special Project warranties and guarantees are included at the end of this Section.

2. Prepare written documents utilizing the appropriate form, ready for execution by the Contractor, or the Contractor and subcontractor, supplier or manufacturer.
 - a. Submit a draft to District through Architect for approval prior to final execution.
 3. Refer to product technical Sections for specific content requirements, and particular requirements for submittal of special warranties.
 4. Prepare standard warranties and guarantees, excepting manufacturers' standard printed warranties and guarantees, on Contractor's, subcontractor's, material supplier's, or manufacturer's own letterhead, addressed to District.
 5. Warranty and guarantee letters shall be signed by all responsible parties and by Contractor in every case, with modifications only as approved in advance by District to suit the conditions pertaining to the warranty or guarantee.
- C. Manufacturer's Guarantee Form:
1. Manufacturer's guarantee form may be used in lieu of special Project form included at the end of this Section.
 2. Manufacturer's guarantee form shall contain appropriate terms and identification, ready for execution by the required parties.
 3. If proposed terms and conditions restrict guarantee coverage or require actions by District beyond those specified, submit draft of guarantee to District through Architect for review and acceptance before performance of the Work.
 4. In other cases, submit draft of guarantee to District through Architect for approval prior to final execution of guarantee.
- D. Signatures: Signatures shall be by person authorized to sign warranties, guarantees and bonds on behalf of entity providing such warranty, guarantee or bond.
- E. Co-Signature: All installer's warranties and bonds shall be co-signed by Contractor. Manufacturer's guarantees will not require co-signature.
- F. Verify that documents are in proper form, contain full information, and are notarized.
- G. Co-execute submittals when required.
- H. Retain warranties and bonds until time specified for submittal.
- I. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- J. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
 1. If more than one volume of warranties, guarantees and bonds is produced, identify volume number on binder.
- K. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- L. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

M. Form of Warranty and Bond Submittals:

1. Prior to final Application and Certificate for Payment, compile two copies of each required warranty, guarantee and bond, properly executed by Contractor, or jointly by Contractor, subcontractor, supplier, or manufacturer.
2. Collect and assemble all written warranties and guarantees into binders and deliver binders to District for final review and acceptance.
3. Include Table of Contents for binder, neatly typed, following order and Section numbers and titles as used in the Project Manual.
4. Provide heavy paper dividers with celluloid or plastic covered tabs for each separate warranty.
 - a. Mark tabs to identify products or installation, and Section number and title.
5. Include on separate typed sheet, if information is not contained in warranty or guarantee form, a description of the product or installation, and the name, address, telephone number and responsible person for applicable installer, supplier and manufacturer.
6. When operating and maintenance data manuals are required for warranted construction, include additional copies of each required warranty and guarantee in each required manual.
 - a. Coordinate with requirements listed in the prior articles for operating and maintenance data manuals.

3.07 TIME OF WARRANTY AND BOND SUBMITTALS

A. Submission of Preliminary Copies:

1. Unless otherwise specified, obtain preliminary copies of warranties, guarantees and bonds within ten days of completion of applicable item or Work.
2. Prepare and submit preliminary copies for review as specified herein.

B. Submission of Final Copies:

1. Submit fully executed copies of warranties, guarantees and bonds within ten days of date identified in Certificate of Completion but no later than three days prior to date of final Application for Payment.

C. Date of Warranties and Bonds:

1. Unless otherwise directed or specified, commencement date of warranty, guarantee and bond periods shall be the date established in the Certificate of Completion.
2. Warranties for Work accepted in advance of date stated in Certificate of Completion:
 - a. When a designated system, equipment, component parts or other portion of the Work is completed and occupied or put to beneficial use by District:
 - 1) By separate agreement with Contractor, prior to completion date established in the Certificate of Completion, submit properly executed warranties to District within ten days of completion of that designated portion of the Work.
 - 2) List date of commencement of warranty, guarantee or bond period as the date established in the Certificate of Completion.

3. Warranties for Work not accepted as of date established in the Certificate of Completion:
 - a. Submit documents within ten days after acceptance, listing date of acceptance as beginning of warranty, guarantee or bond period.

D. Duration of Warranties and Guarantees:

1. Unless otherwise specified or prescribed by law, warranty and guarantee periods shall be not less than the Correction Period required by the Conditions of the Contract.
2. In no case, the period is to be less than one year from the date established for completion of the Project in the Certificate of Completion.
3. See product Specifications Sections of the Project Manual for extended warranty and guarantee beyond the minimum one year duration.

END OF SECTION

**SECTION 01 78 00.01
WARRANTY FORM LETTER**

FOR CONTRACTOR'S / SUBCONTRACTOR'S / MANUFACTURER'S WARRANTY

CONTRACTOR'S/SUBCONTRACTOR'S/SUPPLIER'S LETTERHEAD

SPECIAL LIMITED PROJECT WARRANTY FOR _____ WORK.

We, the undersigned, do hereby warrant that the portion of the Work described above which we have provided for Science Building Modernization is in accordance with the Contract Documents and that all such Work as installed will fulfill or exceed all minimum warranty requirements. We agree to repair or replace Work installed by us, together with any adjacent Work which is displaced or damaged by so doing, that proves to be defective in workmanship, material, or function within a period of (years), commencing (date identified in Certificate of Completion, unless otherwise directed) and terminating (date).

The following terms and conditions apply to this warranty (obtain District 's approval before submission):

In the event of our failure to comply with the above-mentioned conditions within a reasonable time period determined by the District , after notification in writing, we, the undersigned, all collectively and separately, hereby authorize the District to have said defective Work repaired or replaced to be made good, and agree to pay to the District upon demand all moneys that the District may expend in making good said defective Work, including all collection costs and reasonable attorney fees.

LOCAL REPRESENTATIVE: FOR WARRANTY MAINTENANCE, REPAIR, OR REPLACEMENT SERVICE, CONTACT:

(Name) _____
(Address) _____
(City) _____ (State) _____ (ZIP) _____
(Phone) _____ / _____
(signed) _____
(Date) _____ (Typed Name) _____
(Title) _____ (Firm) _____

CONTRACTOR:

State License No: _____
(signed) _____
(Date) _____ (Typed Name) _____
(Title) _____ (Firm) _____

FORM LETTER

FORM LETTER

FOR CONTRACTOR'S / MANUFACTURER'S GUARANTEE

CONTRACTOR'S / MANUFACTURER'S LETTERHEAD

SPECIAL LIMITED PROJECT [__ WARRANTY__] [__ GUARANTEE__] FOR _____ WORK.

We, the undersigned, do hereby [__ warrant__] [__ guarantee__] that the portion of the Work described above which [__ we have provided__] [__ was provided by (Installer or Subcontractor's Name)__] for Science Building Modernization in accordance with the Contract Documents and that all such Work as installed will fulfill or exceed all minimum warranty requirements. We agree to repair or replace Work installed by [__ us,__] [__(Installer or Subcontractor's Name)__] together with any adjacent Work which is displaced or damaged by so doing, that proves to be defective in workmanship, material, or function within a period of (years), commencing (date indicated in Certificate of Completion, unless otherwise directed) and terminating (date).

The following terms and conditions apply to this [__ warranty__] [__ guarantee__] (obtain District's approval before submission):

In the event of our failure to comply with the above-mentioned conditions within a reasonable time period determined by the District, after notification in writing, we, the undersigned, all collectively and separately, hereby authorize the District to have said defective Work repaired or replaced to be made good, and agree to pay to the District upon demand all moneys that the District may expend in making good said defective Work, including all collection costs and reasonable attorney fees.

LOCAL REPRESENTATIVE: FOR WARRANTY MAINTENANCE, REPAIR, OR REPLACEMENT SERVICE, CONTACT:

(Name) _____
(Address) _____
(City) _____ (State) _____ (ZIP) _____
(Phone) _____ / _____
(signed) _____
(Date) _____ (Typed Name) _____
(Title) _____ (Firm) _____

CONTRACTOR:

State License No: _____
(signed) _____
(Date) _____ (Typed Name) _____
(Title) _____ (Firm) _____

FORM LETTER

END OF SECTION

SECTION 01 79 00
DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

- A. Demonstration of products and systems to be commissioned and where indicated in specific specification sections.
- B. Training of District personnel in operation and maintenance is required for:
 - 1. All software-operated systems.
 - 2. HVAC systems and equipment.
 - 3. Plumbing equipment.
 - 4. Electrical systems and equipment.
 - 5. Conveying systems.
 - 6. Landscape irrigation.
 - 7. Items specified in individual product Sections.
- C. Training of District personnel in care, cleaning, maintenance, and repair is required for:
 - 1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
 - 2. Finishes, including flooring, wall finishes, ceiling finishes.
 - 3. Fixtures and fittings.
 - 4. Items specified in individual product Sections.

1.02 RELATED REQUIREMENTS

- A. Section 01 78 00 - Closeout Submittals: Operation and maintenance manuals.
- B. Section 01 91 13 - General Commissioning Requirements: Additional requirements applicable to demonstration and training.
- C. Other Specification Sections: Additional requirements for demonstration and training.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Training Plan: District will designate personnel to be trained; tailor training to needs and skill-level of attendees.
 - 1. Each Sub, Design-Builder SubContractor and vendor responsible for training submits a written training plan to the Architect and District Representative for review and approval prior to training.
 - 2. Submit to Architect for transmittal to District.
 - 3. Submit not less than four weeks prior to start of training.
 - 4. Revise and resubmit until acceptable.
 - 5. Provide an overall schedule showing all training sessions.
 - 6. Include at least the following for each training session:

- a. Identification, date, time, and duration.
 - b. Description of products and/or systems to be covered.
 - 1) Equipment list
 - c. Name of firm and person conducting training; include qualifications.
 - d. Intended audience, such as job description.
 - e. Objectives of training and suggested methods of ensuring adequate training.
 - 1) Agenda and subjects (design intent, equipment inspections, modes of operation, system interactions, troubleshooting, preventative maintenance, etc.)
 - f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
 - g. Media to be used, such a slides, hand-outs, etc.
 - 1) The approved O&M manuals shall be used during the training for equipment specific references.
 - h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.
- C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
- 1. Include applicable portion of O&M manuals.
 - 2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
 - 3. Provide one extra copy of each training manual to be included with operation and maintenance data.
- D. Training Reports:
- 1. Identification of each training session, date, time, and duration.
 - 2. Sign-in sheet showing names and job titles of attendees.
 - 3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.
 - 4. Include Commissioning Authority's formal acceptance of training session.
- E. Video Recordings: Submit digital video recording of each demonstration and training session for District's subsequent use.
- 1. Format: DVD Disc.
 - 2. Label each disc and container with session identification and date.

1.04 QUALITY ASSURANCE

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
- 1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
 - 2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 TRAINING OF OWNER PERSONNEL

- A. The Contractor and Design-Builder SubContractors shall be responsible for training coordination and scheduling and for ensuring that training is completed.
- B. The Commissioning Authority (CA) shall be responsible for reviewing and approving the content of the training of Owner personnel for commissioned equipment.
- C. The specific training requirements of District personnel by Subs, Design-Builder SubContractors and vendors is specified in the Division in which the equipment is specified.
- D. For primary HVAC equipment, the Controls Contractor shall provide a short discussion of the control of the equipment during the mechanical or electrical training conducted by others.

3.02 DEMONSTRATION - GENERAL

- A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by District.
- B. Demonstrations conducted during Functional Testing need not be repeated unless District personnel training is specified.
- C. Demonstration may be combined with District personnel training if applicable.
- D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
 - 1. Perform demonstrations not less than two weeks prior to Substantial Completion.
 - 2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
 - 1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.03 TRAINING - GENERAL

- A. Commissioning Authority will prepare the Training Plan based on draft plans submitted.
- B. Conduct training on-site unless otherwise indicated.
- C. District will provide classroom and seating at no cost to Contractor.
- D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Authority.
- E. Provide training in minimum two hour segments.
- F. The Commissioning Authority is responsible for determining that the training was satisfactorily completed and will provide approval forms.
- G. Training schedule will be subject to availability of District's personnel to be trained; re-schedule training sessions as required by District; once schedule has been approved by

District failure to conduct sessions according to schedule will be cause for District to charge Contractor for personnel "show-up" time.

- H. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
 - 1. The location of the O&M manuals and procedures for use and preservation; backup copies.
 - 2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
 - 3. Typical uses of the O&M manuals.
- I. Product- and System-Specific Training:
 - 1. Review the applicable O&M manuals.
 - 2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
 - 3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
 - 4. Provide hands-on training on all operational modes possible and preventive maintenance.
 - 5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
 - 6. Discuss common troubleshooting problems and solutions.
 - 7. Discuss any peculiarities of equipment installation or operation.
 - 8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
 - 9. Review recommended tools and spare parts inventory suggestions of manufacturers.
 - 10. Review spare parts and tools required to be furnished by Contractor.
 - 11. Review spare parts suppliers and sources and procurement procedures.
- J. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.
- B. Section 01 10 00 - Summary: Description of items to be removed by District.
- C. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- D. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- E. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
- F. Section 01 74 19 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.03 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards.
- B. CFC Ch. 33 - Fire Safety During Construction and Demolition.
- C. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.04 DEFINITIONS

- A. Remove: Remove and legally dispose of items, except those identified for use in recycling, re-use, and salvage programs.
- B. Environmental Pollution and Damage: The presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human or animal life; affect other species of importance to humanity; or degrade the utility of the environment for aesthetic, cultural or historical purposes.
- C. Inert Fill: A permitted facility that accepts inert waste such as asphalt and concrete exclusively for the purpose of disposal.
 - 1. Inert Solids/Inert Waste: Non-liquid solid waste including, but not limited to, soil and concrete, that does not contain hazardous substances or soluble pollutants at concentrations in excess of water-quality standards established by a regional water board and does not contain significant quantities of decomposable solid waste.
- D. Class III Landfill: A landfill that accepts non-hazardous materials such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and

demolition operations. A Class III landfill must have a solid waste facilities permit from the State of California.

- E. Demolition Waste: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The materials may include rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.
- F. Chemical Waste: Includes petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals and inorganic wastes.
- G. Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
- H. Reuse: The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.
- I. Solid Waste: All putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by State law.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Construction Conference: Conduct a pre-construction conference one week prior to the start of the work of this section; require attendance by all affected trades.
- B. Convene a conference at the Project site 3 days prior to starting demolition to review the Drawings and Specifications, requirements of authorities having jurisdiction, instructions and requirements of serving utilities, sequencing and interface considerations and project conditions.
- C. Conference shall be attended by Construction Manager, supervisory and quality control personnel of Contractor and all subcontractors performing this and directly-related Work.
- D. Submit minutes of meeting to District, Project Inspector and Architect, for Project record purposes.
- E. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.
 - 1. Refer to sequence requirements specified in Section 01 10 00 - Summary; and construction progress schedule requirements specified in Section 01 32 16 - Construction Progress Schedule.

1.06 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain property of Grossmont Union High School District, demolished materials

shall become the Contractor's property and shall be removed, recycled, or disposed from Project site in an appropriate and legal manner.

1. Arrange a meeting no less than ten (10) days prior to demolition with the District or Construction Manager and other designated representatives to review any salvageable items to determine if District wants to retain ownership, and discuss Contractor's Waste Management and Recycling Plan.

1.07 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Site Plan: Showing:
 1. Areas for temporary construction and field offices.
 2. Areas for temporary and permanent placement of removed materials.
- C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
 2. Identify demolition firm and submit qualifications.
- D. Demolition phase:
 1. Proposed dust-control measures.
 2. Proposed noise-control measures.
 3. Schedule of demolition activities indicating the following:
 - a. Detailed sequence of demolition and removal work, including start and end dates for each activity.
 - b. Dates for shutoff, capping, and continuation of utility services.
 4. Contractor's Waste Management and Recycling Plan: See Section 01 74 19 - Construction Waste Management and Disposal.
 - a. This plan will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures.
 5. Contractor's Reuse, Recycling, and Disposal Report: See Section 01 74 19 - Construction Waste Management and Disposal.
- E. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.
 1. Record drawings: Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

1.08 SUBMITTALS

- A. Demolition and Removal Procedures and Schedule: Submit for Project record only.
- B. Project Record Drawings: Submit in accordance with provisions specified in Section 01 78 00 - Closeout Submittals. Indicate verified locations of underground utilities and storm drainage system on project record drawings.

1.09 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.

1. Minimum of 5 years of documented experience.

1.10 SCHEDULING

- A. Schedule Work to precede new construction.
- B. Describe demolition removal procedures and schedule.
- C. Perform work between the hours of 8am and 5pm, subject to noise abatement regulations and District's approval for noise considerations.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Conform to the relevant Article of the General Conditions, South Coast Air Quality Management District and other applicable regulatory procedures when discovering hazardous or contaminated materials.
- B. Field Measurements and Conditions:
 1. Survey existing conditions and correlate with requirements indicated to determine extent of demolition and recycling required.
 2. In addition to provisions of the Conditions of the Contract, verify dimensions and field conditions prior to construction. Verify condition of substrate and adjoining Work before proceeding with demolition Work. If conflict is found notify Construction Manager, Project Inspector and Architect.
- C. Comply with other requirements specified in Section 01 70 00.
- D. Comply with governing EPA notification regulations before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Obtain and pay for all permits required.
- E. Environmental Controls
 1. Comply with federal, state and local regulations pertaining to water, air, solid waste, recycling, chemical waste, sanitary waste, sediment and noise pollution.
 2. Confine demolition activities to areas defined by public roads, easements, and work area limits indicated on the drawings.
 3. Water Resources: Comply with applicable regulations concerning the direct or indirect discharge of pollutants to underground and natural surface waters.
 - a. Oily Substances: Prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water in such quantities as to affect normal use, aesthetics, or produce a measurable ecological impact on the area.
 - 1) Store and service construction equipment at areas designated for collection of oil wastes.
 4. Dust Control, Air Pollution, and Odor Control: Prevent creation of dust, air pollution and odors.

- a. Use temporary enclosures and other appropriate methods to limit dust and dirt rising and scattering in air to lowest practical level.
 - b. Store volatile liquids, including fuels and solvents, in closed containers.
 - c. Properly maintain equipment to reduce gaseous pollutant emissions.
5. Noise Control: Perform demolition operations to minimize noise.
- a. Repetitive, high level impact noise will be permitted only during the times indicated in Section 01 70 00 - Execution and Closeout Requirements. Repetitive impact noise on the property shall not exceed the following dB limitations:

Sound Level in dB	Time Duration of Impact Noise
70	More than 12 minutes in any hour
80	More than 3 minutes in any hour

- b. Provide equipment, sound-deadening devices, and take noise abatement measures that are necessary to comply with the requirements of this Contract.
 - c. At least once every five successive working days while work is being performed above 55 dB noise level, measure sound level for noise exposure due to the demolition.
 - 1) Measure sound levels on the 'A' weighing network of a General Purpose sound level meter at slow response.
 - 2) To minimize the effect of reflective sound waves at buildings, measurements may be taken three to six feet in front of any building face.
- F. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
- 1. Obtain required permits.
 - 2. Comply with applicable requirements of NFPA 241 and CFC Ch. 33.
 - 3. Use of explosives is not permitted.
 - 4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - a. Survey condition of the building to determine whether removing any element might result in a structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during demolition.
 - 1) Retain a licensed and qualified civil or structural engineer to provide analysis, including calculations, necessary to ensure the safe execution of the demolition work.
 - b. Prevent movement or settlement of adjacent structures. Provide bracing and shoring.
 - c. Perform surveys as the Work progresses to detect hazards resulting from demolition activities.
 - 5. Provide, erect, and maintain temporary barriers and security devices.
 - a. Provide, erect, and maintain temporary barriers, safety and security devices , for protection of streets, sidewalks, curbs, adjacent property and the public.

- b. Protection: Protect existing construction and adjacent areas with temporary barriers and security devices in accordance with requirements specified in Section 01 50 00 - Temporary Facilities and Controls.
 - 1) Review location and type of construction of temporary barriers with District and/or the Construction Manager.
 - 2) Barriers shall control dust, debris and provide protection for persons occupying and using adjacent facilities.
 - 3) Maintain protected egress and access at all times, in accordance with requirements of authorities having jurisdiction and with permission of DSA (AHJ having jurisdiction).
- 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
- 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
- 8. Do not close or obstruct roadways or sidewalks without permit.
- 9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
- 10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- G. Do not begin removal until receipt of notification to proceed from District.
- H. Do not begin removal until built elements to be salvaged or relocated have been removed.
- I. Protect existing structures and other elements that are not to be removed.
 - 1. Provide bracing and shoring.
 - 2. Prevent movement or settlement of adjacent structures.
 - 3. Stop work immediately if adjacent structures appear to be in danger.
 - 4. Protect existing landscaping materials, appurtenances, structures and items that are not to be demolished, or are on adjacent property.
 - 5. Mark location of utilities.
- J. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- K. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.
- L. Remove materials to be re-installed or retained in manner to prevent damage. Store and protect in accordance with requirements of Section 01 60 00 - Product Requirements.
- M. Perform demolition in a manner that maximizes salvage and recycling of materials.
 - 1. Comply with requirements of Section 01 74 19 - Construction Waste Management and Disposal.
 - 2. Dismantle existing construction and separate materials.
 - 3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.
- N. Damages: Promptly repair damages to adjacent facilities caused by demolition operations.

3.02 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to District.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to District.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.
- I. Utility Lines, Posts and Structures:
 - 1. Work by Utility: Posts, conductors, guy wires, boxes, structures and equipment shown to be cleared or removed by the responsible utility company or agency shall be considered work under a separate contract.
 - 2. Coordination: The Contractor shall arrange, schedule and coordinate work by utility companies and agencies.
 - 3. Payment: Costs, if any, imposed by utility companies and agencies shall be included in the Contract Sum.

3.03 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Separate areas in which demolition is being conducted from other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.
 - 2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

- D. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
 - 2. Remove items indicated on drawings.
 - 3. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
 - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - 3. See Section 01 10 00 for other limitations on outages and required notifications.
 - 4. Verify that abandoned services serve only abandoned facilities before removal.
 - 5. Remove abandoned pipe, ducts, conduits, and equipment; remove back to source of supply where possible, otherwise cap stub and tag with identification.
- F. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch as specified for patching new work.

3.04 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 74 19 - Waste Management.
- C. Remove temporary work.
- D. Leave site in clean condition, ready for subsequent work.
- E. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 10 00
CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.
- B. Openings for other work.
- C. Form accessories.
- D. Form stripping.

1.02 RELATED REQUIREMENTS

- A. Section 03 20 00 - Concrete Reinforcing.
- B. Section 03 30 00 - Cast-in-Place Concrete.
- C. Section 04 20 00 - Unit Masonry: Reinforcement for masonry.
- D. Section 05 50 00 - Metal Fabrications: Placement of embedded steel anchors and plates in cast-in-place concrete.
- E. Section 31 62 16.13 - Sheet Steel Piles: Shoring and underpinning related to sheet piles.
- F. Section 32 13 13 - Site Concrete: Sidewalks, curbs and gutters.

1.03 REFERENCE STANDARDS

- A. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.
- B. ACI 301 - Specifications for Structural Concrete.
- C. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.
 - 1. Use 2014 as indicated in 2019 CBC Ch 35 Referenced Standards.
- D. ACI 347R - Guide to Formwork for Concrete.
- E. PS 1 - Structural Plywood.
- F. CBC Chapter 19A.

1.04 DEFINITIONS

- A. Unexposed Finish: A general-use finish, with no appearance criteria, applicable to all formed concrete concealed from view after completion of construction.
- B. Exposed Finish: A general-use finish applicable to all formed concrete exposed to view and including surfaces which may receive a paint coating (if any).

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on void form materials and installation requirements.
 - 1. Form release agent.
- C. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.

1.06 QUALITY ASSURANCE

- A. Industry Standard: Formwork design and construction shall be in accordance with ACI 301, ACI 318, and ACI 347R.
- B. Maintain one copy of each installation standard on site throughout the duration of concrete work.
- C. Regulatory Requirements: Conform to formwork construction requirements of the California Building Code (CBC) Title 24, Part 2, Chapter 19A as amended and adopted by authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver prefabricated forms and installation instructions in manufacturer's packaging.
- B. Store prefabricated forms off ground in ventilated and protected manner to prevent deterioration from moisture.

PART 2 PRODUCTS

2.01 FORMWORK - GENERAL

- A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.
- B. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.
- C. Chamfer outside corners of beams, joists, columns, and walls.
- D. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.
- E. Comply with relevant portions of ACI 347R, ACI 301, and ACI 318.
- F. Provide materials for contact with concrete which impart suitable surface quality to completed concrete. Use the following form types:
 - 1. Forms for Exposed Finish Concrete:
 - a. Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials to provide continuous, straight, smooth, exposed surfaces.
 - b. Furnish in largest practical sizes to minimize number of joints and to conform to joint system shown on the Drawings.
 - 2. Forms for Unexposed Finish Concrete:
 - a. Plywood, lumber, metal, or another acceptable material.
 - b. Provide lumber dressed on at least two edges and one side for tight fit.
 - c. When unexposed concrete is intended to receive waterproofing, provide form as for exposed finish concrete.
- G. Provide materials to construct formwork to support forming materials in contact with concrete, of sufficient capacity to withstand pressures of concrete placement and to support concrete in place until cured, without distortion.

2.02 WOOD FORM MATERIALS

- A. Softwood Plywood for Concealed Surfaces: PS 1, undamaged face C Grade, Group 2 Plugged EXT or APA Structural I Sheathing.
- B. Hardboard: For curved surfaces, tempered hardboard, Masonite Corp., or equal.
- C. Lumber: Douglas fir or douglas fir-larch species; appropriate for intended use grade; with grade stamp clearly visible.
 - 1. Sound and undamaged straight edges, and solid knots, to maintain principal shores to support concrete until minimum strength is achieved as approved by Structural Engineer.
- D. Embedded Nailers: Clear all heart redwood or pressure preservative-treated (PPTDF) douglas fir, edges reverse beveled to key into concrete.

2.03 FORMWORK ACCESSORIES

- A. Form Ties: Removable, adjustable-length or snap-off type, galvanized metal, fixed length, cone type, with waterproofing washer, free of defects that could leave holes larger than 1 inch in concrete surface.
- B. Form Release Agent: Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied.
 - 1. Do not use materials containing diesel oil or petroleum-based compounds.
 - 2. Does not impair subsequent treatments of concrete surfaces or bond of applied coatings.
 - 3. VOC Content: In compliance with applicable local, State, and federal regulations.
 - 4. Products:
 - a. SpecChem, LLC; Bio Strip WB (water-based): www.specchemllc.com/#sle.
 - b. W. R. Meadows, Inc; Duogard: www.wrmeadows.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
- D. Embedded Anchor Shapes, Plates, Angles and Bars: As specified in Section 05 50 00.
- E. Screed Pins and Chairs:
 - 1. Provide units that leave no metal closer than 1-1/2 inch to the plane of the exposed concrete surface.
 - 2. Manufacturers:
 - a. Grann Adjustable Quick Screed (800/554-7266).
 - b. Dayton Richmond (800/745-3700).
 - c. Aztek (877/531-3344).
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 SYSTEM REQUIREMENTS

- A. Formwork Design Requirements: Formwork products and execution specified herein are for finish surface quality only.
 - 1. Design, layout and construction of formwork shall be solely the responsibility of the Contractor.
 - 2. Design and construct formwork, shoring and bracing to conform to California Building Code (CBC), Title 24, Part 2, Chapter 19A requirements and ACI 318.
 - 3. Resulting concrete shall conform to shapes, lines and dimensions indicated and required.
- B. Coordination:
 - 1. Coordinate Work specified in this Section with other Sections which require placement of embedded products and provision of openings and recesses.
 - 2. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from the Architect before proceeding.

3.03 EARTH FORMS

- A. Earth (Soil) Forms, General: Except as otherwise indicated on Drawings, conform to ACI 301, ACI 347R and California Building Code (CBC) requirements. Refer also to notes on Structural Drawings.
- B. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.

3.04 ERECTION - FORMWORK

- A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301, ACI 347R and California Building Code (CBC) Title 24, Part 2 requirements.
- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
 - 1. Use form ties of sufficient strength and sufficient quantities to prevent formwork spreading.
 - 2. Maintain principal shores to support concrete until minimum required strength is achieved.
- C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
 - 1. Design and fabricate forms for easy removal, without impact, shock, or damage to concrete surfaces or other portions of the work.
 - 2. Design to support all applied loads until concrete is adequately cured, within allowable tolerances and deflection limits.

- D. Align joints and make watertight. Keep form joints to a minimum. Make forms watertight to prevent leakage of concrete mortar. Locate form joints, at exposed concrete, to be symmetrical about center of panel, unless otherwise noted. Align joints symmetrically at exposed conditions.
- E. Permanent openings: Provide openings to accommodate Work specified in other Sections. Size and locate openings accurately. Securely support items built into forms; provide additional bracing at openings and discontinuities in formwork.
- F. Temporary openings: Provide temporary openings for cleaning and inspection. Provide drain openings at bottoms of formwork to allow water to drain. Locate temporary openings in most inconspicuous locations at base of forms, closed with tight-fitting panels designed to minimize appearance of joints in finished concrete Work.
- G. Obtain approval before framing openings in structural members that are not indicated on drawings.
- H. Coordinate this section with other sections of work that require attachment of components to formwork.
- I. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.
- J. Inspection: Before placing of concrete, and after placement of reinforcing steel in the forms, provide notification so that proper inspection can be made. Make such notification at least 2 working days in advance of placing concrete.
- K. Rejection of Defective Work: Any movement or bellying of forms during construction or variations in excess of the tolerances specified shall be considered just cause for the removal of such forms and, in addition, the concrete construction so affected. Reconstruct forms, place new concrete and required reinforcing steel at no additional cost to the District.

3.05 APPLICATION - FORM RELEASE AGENT

- A. Form Release Agent: Provide either form materials with factory applied non-absorptive liner or field applied form coating to comply with applicable air quality regulations for VOC. If field applied coating is employed, thoroughly clean and recondition formwork and reapply coating before each use. Rust on form surfaces is not acceptable.
- B. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- C. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- D. Do not apply form release agent where concrete surfaces to receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.06 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in passing through concrete work.
 - 1. Install accessories in accordance with manufacturer's instructions and referenced standards, level, straight and plumb.
- B. Locate and set in place items that are cast directly into concrete.

- C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
 - 1. Openings: Size and locate formed openings, depressions, recesses and chases to accommodate products to be applied to, built into and pass through concrete Work. Coordinate size, location and placement of inserts, embedded products, openings and recesses with Work specified in other Sections.
 - 2. Anchors and Other Devices: Set and build into concrete formwork anchorage devices and other embedded products required for Work to be attached to or supported by concrete elements.
 - 3. Locating Embedded Products and Openings: Use setting drawings, diagrams, instructions and templates to set embedded products.
 - 4. Screeds: Set screeds and establish level for tops of concrete slabs and leveling for finish surfaces. Shape surfaces as indicated on the Drawings. Provide cradle, pad or base type screed supports for concrete over waterproof membranes and vapor retarders.
- D. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- F. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints are not apparent in exposed concrete surfaces.

3.07 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
 - 1. At above grade forms, flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
 - 2. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.
- C. Formwork Reuse: Do not reuse wood and plywood forming materials which contact concrete, except as follows:
 - 1. High density plywood may be cleaned and reused for exposed concrete.
 - 2. Unfaced plywood may be reused for concealed concrete.
 - 3. Steel and fiberglass forming materials may be cleaned and reused.
- D. Patching and Repairs: Patch tie holes with sheet metal patches and restore forms to like new condition prior to reuse.

3.08 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 117, unless otherwise indicated.
 - 1. Also as specified in ACI 301, ACI 318, and ACI 347R, unless otherwise specified or indicated.

- B. Camber slabs and beams in accordance with ACI 301.

3.09 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
- B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.
 - 1. Comply with CBC Table 1705A.3, item 12.
- C. Do not reuse wood formwork more than 3 times for concrete surfaces to be exposed to view. Do not patch formwork.

3.10 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
 - 1. Comply with California Building Code (CBC) requirements.
 - 2. Formwork supporting weight of concrete may not be removed until concrete has reached a minimum of specified 28-day compressive strength and no earlier than 21 days after pour.
 - 3. Removal of Load Bearing Formwork:
 - a. Do not remove shoring and forms supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, until concrete has attained its 28 day specified compressive strength, unless otherwise specified or permitted by the Structural Engineer of Record.
 - b. Determine the actual compressive strength has attained is adequate to support the weight of the concrete and superimposed loads.
 - c. Maintain curing and protection operations after form removal.
 - 4. Removal of Non Load Bearing Formwork After Superimposed Loads or as Approved by Engineer:
 - a. Provided that concrete has hardened sufficiently, that it is not damaged, and has achieved sufficient strength to support its own weight and all imposed construction and design loads, forms not actually supporting weight of concrete or weight of soffit forms may be removed after concrete has cured at not less than 50 degrees F for 24 hours.
 - b. Maintain curing and protection operations after form removal.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
 - 1. Remove formwork progressively so no unbalanced loads are imposed on structure. Remove formwork without damaging concrete surfaces.
 - 2. Remove or snap off metal spreader ties inside wall surface. Cut nails and form ties off flush and leave surfaces level and clean.
- C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

3.11 PATCHING

- A. Schedule: Patch forming and tie holes immediately after form removal.
- B. Cleaning: Clean surface of all loose materials and soiling.
- C. Patching: Patch all holes and depressions with grouting gun and grout mix of one part cement and 2-1/2 parts mortar sand.

3.12 FORMWORK SCHEDULE

- A. Footings and Walls, Not Exposed to View: Site fabricated plywood or lumber, coated with form release agent.
- B. Footings and Walls, Exposed to View: Site fabricated plywood, coated with form release agent compatible with applied finish coatings.

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Reinforcing steel for cast-in-place concrete.
- B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

- A. Section 03 10 00 - Concrete Forming and Accessories.
- B. Section 03 30 00 - Cast-in-Place Concrete.
- C. Division 26 - Electrical: Grounding connection to concrete reinforcement.

1.03 REFERENCE STANDARDS

- A. ACI 301 - Specifications for Structural Concrete.
- B. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.
- C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- D. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
- E. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
- F. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- G. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification.
- H. AWS A5.5/A5.5M - Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding.
- I. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel.
- J. CRSI (DA4) - Manual of Standard Practice.
- K. CRSI (P1) - Placing Reinforcing Bars.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data:
 - 1. Reinforcement supporting and spacing devices at exposed concrete only, to demonstrate non-corroding and non-staining characteristics.
 - 2. Adhesive compounds.
- C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

- D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
- E. Reports: Submit certified copies of mill test report of reinforcement materials analysis.
- F. Quality Control Submittals: Submit the following information related to quality assurance requirements specified:
 - 1. Certifications: Submit to the testing laboratory mill test certificates for all reinforcing steel, showing physical and chemical analysis. If steel is to be welded, include in chemical analysis the percentages of carbon, manganese, copper, nickel, and chromium, and optionally the percentages of molybdenum and vanadium.
 - 2. Certifications: If steel is to be welded, submit certifications to the testing laboratory signed by AWS Certified Welding Inspector (CWI) of prequalified welding procedures, qualifications of welding procedures unless prequalified, qualification of welding operators, and qualification of welders.
- G. Welding Procedure Specification Submittal: Submit to Testing Laboratory written Welding Procedure Specifications (WPS) as defined by AWS D1.4/D1.4M. The WPS shall be prepared by the Fabricator for review and approval by the Architect (Structural Engineer) and Testing Laboratory as complying with specified criteria, and shall be readily available to the welding inspector.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with CRSI (DA4), CRSI (P1), ACI 301, and ACI 318.
 - 1. Maintain one copy of each document on project site.
- B. Regulatory Requirements: Conform to California Building Code (CBC) Title 24 Part 2, Chapter 19A requirements as amended and adopted by authorities having jurisdiction, for details of reinforcement.
- C. Provide Architect, Project Inspector, and Special Inspector with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.
- D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.4/D1.4M and no more than 12 months before start of scheduled welding work.
 - 1. Only AWS Certified Welding Inspectors shall be used for tests and qualifications associated with welding of reinforcing steel.
 - 2. Only AWS qualified welders or welding operators shall perform welding of reinforcing steel.
- E. Coordinate Work specified in this Section with other Sections which require placement of embedded products and provision of openings and recesses.
- F. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Architect (Structural Engineer) before proceeding.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver reinforcement bars new and free from rust and mill scale in original bundles marked with durable identification tags.

- B. Storage: Store reinforcement to avoid excessive rusting or fouling with grease, oil, dirt or other bond-weakening coatings.
- C. Handling: Take precautions to maintain reinforcement identification after bundles are broken.

PART 2 PRODUCTS

2.01 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Deformed billet-steel bars.
 - 2. Unfinished.
- B. Reinforcing Steel: ASTM A706/A706M, deformed low-alloy steel bars.
 - 1. Unfinished.
 - 2. Carbon Content: 0.55 % maximum.
- C. Reinforcing Steel: #3 Deformed bars, ASTM A615/A615M Grade 40 (280), Type A.
- D. Tie Wire: ASTM A1064/A1064M steel wire, unfinished.
- E. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Wire-bar-type devices, complying with CRSI (DA4), for spacing, supporting and fastening reinforcing bars and welded wire reinforcement in place. Sized and shaped for adequate support of reinforcement during concrete placement.
 - a. Supports at Slab on Grade: Provide devices with load-bearing pads or horizontal runners where base material does not support chair legs, to prevent puncture of vapor retarder/barrier or provide precast concrete block bar supports of equal or greater strength to specified concrete.
 - b. Corrosion Resistance:
 - 1) Provide stainless steel or plastic components for placement within 1-1/2 inches of weathering surfaces.
 - (a) Provide plastic coated, plastic-tipped (CRSI, Class 1) or stainless steel types at exposed-to-view concrete surfaces.
 - (b) Provide only stainless steel (CRSI Class 2) at exterior exposed surfaces to be painted.
 - 3. Welding Electrodes: AWS A5.5/A5.5M E80XX, low hydrogen, with a minimum yield point of 80,000 psi, for welding grade 60 reinforcing steel.

2.02 RE-BAR SPLICING:

- A. Coupler Systems: Mechanical devices for splicing reinforcing bars; capable of developing 160% of steel reinforcing design strength in tension and compression.
- B. Dowel Bar Splicer with Dowel-Ins: Mechanical devices for connecting dowels; Type II capable of developing 160% of steel reinforcing design strength in tension and compression.
- C. Grout: Cementitious, non-metallic, non-shrink grout for use with manufacturer's grout sleeve reinforcing bar coupler system.

2.03 FABRICATION

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
- B. Welding of reinforcement is permitted only with the specific approval of Architect. Perform welding in accordance with AWS D1.4/D1.4M.
- C. Fusion welded reinforcing steel assemblies are not permitted.
- D. Locate reinforcing splices not indicated on drawings at point of minimum stress. See Structural Drawings,
 - 1. Review locations of splices with Architect (Structural Engineer) before fabrication and placement. .

PART 3 EXECUTION

3.01 PREPARATION

- A. Cleaning: Clean reinforcement to remove loose rust and mill scale, soil, and other materials which may reduce or destroy bond with concrete.
- B. Adjustment and Inspection: Do not bend or straighten reinforcement in a manner injurious to material. Do not use bars with kinks or bends not shown on Drawings and reviewed shop drawings, or bars with reduced cross-section due to corrosion or other cause.
- C. Do not bend bars No. 5 and larger in the field.
- D. Do not bend bars more than once in the same location.

3.02 PLACEMENT

- A. General: Place and secure reinforcement as specified herein, as indicated and noted on Drawings and in compliance with recommended details and methods of reinforcement placement and support specified in CRSI Placing Reinforcing Bars.
- B. Place, support and secure reinforcement against displacement. Do not deviate from required position.
 - 1. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- C. Do not displace or damage vapor barrier.
- D. Accommodate placement of formed openings.
- E. Maintain concrete cover around reinforcing as indicated on Structural Drawings:
- F. Comply with applicable code for concrete cover over reinforcement.
 - 1. If not otherwise indicated on Drawings or specified herein, provide concrete cover in compliance with ACI 318.
- G. Bond and ground all reinforcement to requirements of Division 26.
- H. Coordination: Locate reinforcement to accommodate embedded products and formed openings and recesses.
- I. Slab on Grade Reinforcement: Do not displace or damage vapor retarder/barrier at slab on grade.
- J. Wire Reinforcement Placement: Place reinforcement in sheets as long as practicable, lapping adjoining pieces at least one full mesh and lace splices with 16 gage wire. Offset end laps in

adjacent widths to prevent continuous laps. Extend reinforcement to within 1-inch of edge at slabs on grade. Cut mesh at expansion joints and full depth control joints.

- K. Dowels: Secure tie dowels in place before depositing concrete. Provide No. 3 bars for securing dowels where no other reinforcement is provided.
- L. Reinforcement Splices, General: Provide standard reinforcement splices by lapping ends, placing bars in contact and tightly wire tying. Comply with details and requirements of ACI 318 for minimum lap of spliced bars and criteria indicated on the Drawings.
 - 1. Clearances for Splices: Wherever possible, provide minimum 1-1/2 inch clearance between sets of splices. Stagger horizontal bars so that adjacent splices are minimum 48 inches apart.
- M. Reinforcement Supports: Support reinforcement on metal chairs, spacers or metal hangers to provide required coverage and to properly locate reinforcement. Do not use wood. Avoid cutting or puncturing vapor retarder/barrier during reinforcement placement and concreting operations. Repair damages before placing concrete.
 - 1. Support Spacing: Space chairs and accessories in conformance with CRSI Placing Reinforcing Bars.
- N. Welding of Reinforcement Steel
 - 1. Welding: Perform welding under continuous inspection and supervision of a qualified Registered Deputy Inspector employed by testing and inspection agency. Weld reinforcement as indicated on Drawings.

If mill test report is not available, make chemical analysis of bars representative of bars to be welded. Bars with CE above 0.75 shall not be welded.
 - 2. No welds shall be made at bends in reinforcing bars. Welds to be 1 inch minimum from bends
- O. Corrections During Concrete Placement: Maintain reinforcing steel workers on-site during placement of concrete for resetting reinforcement displaced by runways, workers and other causes.

3.03 FIELD QUALITY CONTROL

- A. An independent testing agency, as specified in Section 01 40 00 - Quality Requirements, will inspect installed reinforcement for compliance with contract documents before concrete placement.
 - 1. Concrete floor slabs on grade are to be continuously inspected as recommended in the geotechnical report.
- B. Inspector of Record, as specified in Section 01 45 33 - Code-Required Special Inspections, will inspect installed reinforcement for conformance to contract documents before concrete placement.
 - 1. Concrete floor slabs on grade are to be continuously inspected as recommended in the geotechnical report.
- C. Defective Reinforcement Work: The following shall be considered defective and may be ordered to be removed and reconstructed at no change in Contract Time or Sum.
 - 1. Bars with kinks or bends not shown on Drawings.
 - 2. Bars injured due to bending or straightening.

3. Bars heated or bent.
4. Reinforcement not placed in accordance with Drawings and Specifications.
5. Rusty or oily bars.
6. Bars exposed in surface of concrete or without adequate concrete cover.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Floors and slabs on grade.
- B. Concrete foundations and anchor bolts.
- C. Joint devices associated with concrete work.
- D. Miscellaneous concrete elements, including equipment pads and thrust blocks.
- E. Concrete curing.

1.02 RELATED REQUIREMENTS

- A. Section 03 10 00 - Concrete Forming and Accessories: Forms and accessories for formwork.
- B. Section 03 20 00 - Concrete Reinforcing.
- C. Section 07 92 00 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.
- D. Section 32 13 13 - Site Concrete: Sidewalks, curbs and gutters.

1.03 REFERENCE STANDARDS

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
- B. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete.
- C. ACI 301 - Specifications for Structural Concrete.
- D. ACI 302.1R - Guide to Concrete Floor and Slab Construction.
- E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
- F. ACI 305R - Guide to Hot Weather Concreting.
- G. ACI 306R - Guide to Cold Weather Concreting.
- H. ACI 308R - Guide to External Curing of Concrete.
- I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.
 - 1. Use 2014 as indicated in 2019 CBC Ch 35 Referenced Standards.
- J. ASTM C33/C33M - Standard Specification for Concrete Aggregates.
 - 1. Use 2013 as indicated in 2019 CBC Ch 35 Referenced Standards.
- K. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- L. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 - 1. Use 2017 as indicated in 2019 CBC Ch 35 Referenced Standards.
- M. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens).
- N. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.

- O. ASTM C150/C150M - Standard Specification for Portland Cement.
 - 1. Use 2015 as indicated in 2019 CBC Ch 35 Referenced Standards.
- P. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
- Q. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- R. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- S. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete.
 - 1. Use 2014 as indicated in 2019 CBC Ch 35 Referenced Standards.
- T. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
- U. ASTM C579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
- V. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.
- W. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
- X. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete.
- Y. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
- Z. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
- AA. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.
- AB. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness.
- AC. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics.
- AD. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- AE. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- AF. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- AG. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- AH. COE CRD-C 572 - Corps of Engineers Specifications for Polyvinylchloride Waterstop.
- AI. NSF 61 - Drinking Water System Components - Health Effects.
- AJ. NSF 372 - Drinking Water System Components - Lead Content.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
 - 1. Including printed statement of VOC content and material safety data sheets.
- C. Mix Design: Submit proposed concrete mix design.
 - 1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
 - 2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 19 - Concrete: Design and Durability Requirements, and Chapter 26 - Construction Documents and Inspection..
- D. Shop Drawings: Submit proposed layout of construction and control joints for approval.
- E. Samples: Submit samples of underslab vapor retarder to be used.
- F. Test Reports: Submit report for each test or series of tests specified.
- G. Mix Design: Submit mix designs prepared, stamped and signed by a Civil Engineer licensed in the State of California.
- H. Quality Control Submittals:
 - 1. Field tests: Submit reports of all slump, strength and air content tests as required by authorities having jurisdiction and as indicated on the Drawings and specified herein.
 - 2. Delivery tickets: Have available copies of delivery tickets complying with ASTM C94/C94M for each load of concrete delivered to site. Include on the tickets the additional information specified in the ASTM document.
- I. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- J. Project Record Documents: Accurately record actual locations of embedded utilities and components that are concealed from view upon completion of concrete work.
- K. Warranty: Submit manufacturer warranty and ensure forms have been completed in District's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
 - 1. Maintain one copy of each document on site.
- B. Follow recommendations of ACI 305R when concreting during hot weather .
- C. When air temperature in the shade and away from artificial heat falls below 40 degrees F, or when concrete without special protection is likely to be subject to freezing temperatures before expiration of specified curing period, follow recommendations of ACI 306R when concreting during cold weather.
- D. For slabs required to include moisture vapor reducing admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for every day of placement.
- E. Regulatory Requirements:

1. Conform to California Building Code (CBC) Chapter 19A requirement, as amended and adopted by authorities having jurisdiction.
2. Chemical products field-applied to concrete shall comply with applicable air quality requirements of authorities having jurisdiction.
 - a. Comply with Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions, CALGreen Section 5.504.4 Finish material pollutant control; 5.504.4.1 Adhesives, sealants and caulks; 5.504.4.3 Paints and coatings.
- F. Testing Agency Services: District will engage an independent testing and inspection agency to conduct tests and perform other services specified for quality control during construction, as required by Sections 01 40 00 - Quality Requirements and Section 01 45 33 - Code-Required Special Inspections.
- G. Coordination: Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories. Coordinate concrete requirements with Work specified for underground utilities and mechanical and electrical equipment pads and bases.

1.06 MOCK-UP

- A. Construct and erect mock-up panel for architectural concrete surfaces indicated to receive special treatment or finish as result of formwork.
 1. Panel Size: Sufficient to illustrate full range of treatment.
 2. Number of Panels: Two.
 3. Locate as indicated on drawings.
- B. If requested by Architect, cast concrete against mock-up panel. Obtain acceptance of resulting surface finish prior to erecting formwork.
- C. Accepted mock-up panel is considered basis of quality for the finished work. Keep mock-up exposed to view for duration of concrete work.
- D. Mock-up may remain as part of the Work.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Slabs with Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover cost of flooring failures due to moisture migration from slabs for life of the concrete.
 1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.
 2. Provide warranty by manufacturer of MVRA matching terms of flooring adhesive or primer manufacturer's material defect warranty.
- C. Moisture Emission-Reducing Curing and Sealing Compound, Membrane-Forming: Provide warranty to cover cost of flooring delamination failures for 10 years.
 1. Include cost of repair or removal of failed flooring, remediation with a moisture vapor impermeable surface coating, and replacement of flooring with comparable flooring system.

1.08 DELIVERY AND HANDLING

- A. Protection During Concrete Placement: Provide protective coverings and runways, and use appropriate equipment and means of access to Work areas to avoid soiling or damage to existing conditions.
- B. Runoff: Prevent run off of water contaminated by construction agents and chemicals from soiling existing surfaces and from contaminating existing and future landscape areas.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Comply with requirements of Section 03 10 00.

2.02 REINFORCEMENT MATERIALS

- A. Comply with requirements of Section 03 20 00.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150/C150M, Type II - Moderate Portland type.
 - 1. Cement used in contact with soil shall be Type V - Sulfate Resistant.
 - 2. Acquire cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
 - 1. Acquire aggregates for entire project from same source.
 - 2. Fine and coarse aggregates, CBC Title 24, Part 2, and as follows.
 - a. Structural Concrete: Maximum size not larger than 1/5 of narrowest dimension between forms, 1/3 depth of slab nor 3/4 of minimum clear spacing between individual reinforcing bars. Maximum aggregate size shall be 1 inch.
 - b. Other than Structural Concrete: Conform to requirements for structural concrete.
 - 1) Except maximum aggregate for concrete fill at stair tread and landings shall be 3/8 inch maximum.
 - c. Gymnasium slab on grade:
 - 1) Aggregate shall be 3/4 inch screen crushed limestone or similar type material (no river gravel or pea gravel), free of curing agents.
 - 2) Concrete shall develop an average of 3,500 PSI compression after 28 days., unless noted otherwise on Structural Drawings.
- C. Lightweight Aggregate: ASTM C330/C330M.
 - 1. Aggregates for Lightweight Structural Concrete: For dry concrete weight as indicated on Drawings, expanded shale and as follows:
 - a. Coarse Aggregates: Naturally expanded lightweight coarse aggregates are not acceptable.
 - b. Fine Aggregates: Normal fine aggregate may be used in combination with lightweight fine aggregate.
- D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.04 ADMIXTURES

- A. Chemical Admixture:
1. Use no admixtures not included in mix design. Products of the following manufacturers are specified and will be acceptable provided they comply with referenced standards all other requirements of the Contract Documents:
 - a. Manufacturers:
 - 1) BASF Building Systems: www.buildingsystems.basf.com.
 - 2) Dayton Superior Corporation: www.daytonsuperior.com.
 - 3) Euclid Chemical Co.: www.euclidchemical.com.
 - 4) L&M Construction Chemicals, Inc.: www.lmcc.com.
 - 5) Larsen Products Corp.: www.larsenproducts.com.
 - 6) MeadowBurke Co.: meadowburke.com.
 - 7) W.R. Meadows, Inc.: www.wrmeadows.com.
 - 8) Sika Corporation; www.us.sika.com.
 - 9) Simpson Strong-Tie: www.strongtie.com
 - 10) Specialty Products Group: www.SPGoGreen.com.
 - 11) US Spec Division of US Mix Products Co.: www.usspec.com.
 - 12) Substitutions: See Section 01 60 00 - Product Requirements.
- B. Do not use chemicals that result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- C. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
1. Manufacturers:
 - a. Euclid Chemical Company; ACCELGUARD 80: www.euclidchemical.com/#sle.
 - b. Accelguard 80 by Euclid Chemical Co.
 - c. Pozzutec 20 by Master Builders Technology, Inc.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
1. Manufacturers:
 - a. L.M. Scofield Company: www.scofield.com.
 - b. Eucon Retarder 75 by Euclid Chemical Co.
 - c. Pozzolite R by Master Builders Technology, Inc.
 - d. Plastiment by Sika Corporation.
 - e. _____.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Water Reducing Admixture: ASTM C494/C494M Type A.
1. Manufacturers:
 - a. Euclid Chemical Company; EUCON NW: www.euclidchemical.com/#sle.
 - b. Eucon WR-75 by Euclid Chemical Co.
 - c. Pozzolite Normal or Polyheed by Master Builders Technology, Inc.
 - d. Plastocrete 161 by Sika Corporation.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.

- F. Moisture Vapor Reducing Admixture (MVRA): Liquid, inorganic admixture free of volatile organic compounds (VOCs) and formulated to close capillary systems formed during curing to reduce moisture vapor emission and transmission with no adverse effect on concrete properties or finish flooring.
1. Provide admixture in slabs to receive adhesively applied flooring.
 2. Installed admixture to meet or exceed Modified ASTM F1869 or ASTM F2170 testing to performance of moisture vapor emission rate (MVER) of 4 lbs/1,000 ft²/24 hours or lower.
 - a. Alternative test methods shall be acceptable to the finish flooring manufacturer and installer.
 3. The concrete ready mix supplier must coordinate with the admixture manufacturer before designing and testing any new mix designs, to receive guidance on achieving proper water absorption characteristics.
 4. Manufacturers:
 - a. Barrier One, Inc; Barrier One Moisture Vapor Reduction Admixture: www.barrierone.com/#sle.
 - b. Concure Systems; Concure Systems Admixture: www.concuresystems.com.
 - c. Hycrete, Inc: www.hycrete.com/#sle.
 - d. ISE Logik Industries, Inc; MVRA 900: www.iselogik.com/#sle.
 - e. Specialty Products Group; Vapor Lock 20/20: www.spggogreen.com/#sle.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Waterproofing Admixture: Admixture formulated to reduce permeability to liquid water, with no adverse effect on concrete properties.
1. Admixture Composition: Crystalline, functioning by growth of crystals in capillary pores.
 2. Manufacturers:
 - a. Aquafin, Inc: www.aquafin.net/#sle.
 - b. ConShield Technologies, Inc; Crystal X: www.conshield.com/#sle.
 - c. Euclid Chemical Company; Eucon Vandex AM-10: www.euclidchemical.com/#sle.
 - d. ISE Logik Industries, Inc; CWPA 800: www.iselogik.com/#sle.
 - e. The Penetron Group; PENETRON ADMIX SB: www.penetron.com/#sle.
 - f. Specialty Products Group; Vapor Lock 20/21: www.spggogreen.com/#sle.
 - g. W. R. Meadows, Inc; ADI-CON CW Plus: www.wrmeadows.com/#sle.
 - h. Xypex Chemical Corporation; XYPEX Admix C-500: www.xypex.com/#sle.
 - i. Substitutions: See Section 01 60 00 - Product Requirements.

2.05 ACCESSORY MATERIALS

- A. Underslab Vapor Retarder:
1. Sheet Material: ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single ply polyethylene is prohibited.
 2. See Section 072616 - Under-Slab Vapor Retarder.

3. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
4. Manufacturers:
 - a. Fortifiber Building Systems Group; Moistop Ultra 15, 15 mils thick (0.010 max. permeance), Class A, unreinforced polyolefin: www.fortifiber.com/#sle.
 - b. ISI Building Products; Viper VaporCheck II 15-mil (Class A): www.isibp.com/#sle.
 - c. Raven Industries; VaporBlock VB15, 15 mils thick (0.01 perms), Class A, unreinforced polyolefin: ravenfd.com,
 - d. Reef Industries, Inc.; Vaporguard, 15 mil (E-96 0.000 perms), Class B: www.reefindustries.com
 - e. Stego Industries, LLC; Stego Wrap Vapor Barrier, 15 mils: www.stegoindustries.com.
 - f. W. R. Meadows, Inc; PERMINATOR Class A - 15 mils (0.38 mm): www.wrmeadows.com/#sle.
 - g. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 1. Grout: Comply with ASTM C1107/C1107M.
 2. Height Change, Plastic State; when tested in accordance with ASTM C827/C827M:
 - a. Maximum: Plus 4 percent.
 - b. Minimum: Plus 1 percent.
 3. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
 4. Minimum Compressive Strength at 28 Days: 8,000 pounds per square inch.
 5. Flowable Products:
 - a. Dayton Superior Corporation: www.daytonsuperior.com/#sle.
 - b. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; DURAGROUT: www.laticrete.com/our-products/concrete-construction-chemicals/#sle.
 - c. Sika Corporation; SikaGrout 328: www.us.sika.com.
 - d. SpecChem, LLC; SC Precision Grout: www.specchemllc.com/#sle.
 - e. US SPEC; MP Grout: www.usspec.com.
 - f. W. R. Meadows, Inc; 588-10K: www.wrmeadows.com/#sle.
 - g. W. R. Meadows, Inc; 1428 HP: www.wrmeadows.com/#sle.
 - h. Substitutions: See Section 01 60 00 - Product Requirements.
 6. Low-Slump, Dry Pack Products:
 - a. Dayton Superior Corporation; Dri Pak Precast Grout: www.daytonsuperior.com/#sle.
 - b. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; Duragrout: www.lmcc.com/#sle.
 - c. Sika Corporation; SikaGrout 212: www.us.sika.com.
 - d. US SPEC; GP Grout: www.usspec.com.

- e. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Non-Shrink Epoxy Grout: Moisture-insensitive, two-part; consisting of epoxy resin, non-metallic aggregate, and activator.
1. Composition: High solids content material exhibiting positive expansion when tested in accordance with ASTM C827/C827M.
 - a. Maximum Height Change: Plus 4 percent.
 - b. Minimum Height Change: Plus 1 percent.
 2. Minimum Compressive Strength at 7 days, ASTM C579: 12,000 pounds per square inch.
OR
 3. Minimum Compressive Strength at 7 days, ASTM D695: 12,000 pounds per square inch.
 4. Manufacturers:
 - a. Euclid Chemical Company; E3-DEEP POUR: www.euclidchemical.com/#sle.
 - b. Dayton Superior Corporation: www.daytonsuperior.com/#sle.
 - c. Euclid Chemical Co.; www.euclidchemical.com.
 - d. Five Star Products, Inc; Five Star DP Epoxy Grout: www.fivestarprouducts.com.
 - e. L&M Construction Chemicals, Inc.; www.lmcc.com.
 - f. Sika Corporation; Sika Grout Pak 42: www.us.sika.com.
 - g. SpecChem, LLC; SpecPoxy Grout: www.specchemllc.com.
 - h. US Mix Products Co.; www.usspec.com.
 - i. W.R. Meadows, Inc.; REZI-WELD 3/2: www.wrmeadows.com.
 - j. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 BONDING AND JOINTING PRODUCTS

- A. Interior Exposed Control Joints: Sawcut joints after concrete placement and finish. Preformed joint materials are not acceptable.
- B. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
 1. Acrylic or Styrene Butadiene:
 2. Manufacturers:
 - a. BASF Building Systems; MasterEmaco A 400 or A 600: www.buildingsystems.basf.com.
 - b. Dayton Superior Corp.; Acrylic Bonding Agent J40: www.daytonsuperior.com
 - c. Euclid Chemical Company; AKKRO-7T: www.euclidchemical.com/#sle.
 - d. L&M Construction Chemicals, Inc.; Everbond: www.lmcc.com.
 - e. MeadowBurke Co.; Arcylic Bond: meadowburke.com.
 - f. Sika Corporation; Sika Latex by Sika Corporation: www.us.sika.com.
 - g. Simpson Strong-Tie; FX-Bondcrete: www.strongtie.com
 - h. SpecChem, LLC; Strong Bond Acrylic Bonder: www.specchemllc.com/#sle.
 - i. W. R. Meadows, Inc; ACRY-LOK-: www.wrmeadows.com/#sle.
 - j. US Spec Division of US Mix Products Co.; Acrylcoat, Dura: www.usspec.com.
 - k. Substitutions: See Section 01 60 00 - Product Requirements.

- C. Epoxy Bonding System:
1. Complying with ASTM C881/C881M and of Type required for specific application.
 2. Manufacturers:
 - a. Adhesives Technology Corporation; Crackbond SLV-302, Crackbond LR-321, Crackbond LR-321 LPL, Ultrabond 2100 LPL, Ultrabond 2100, Ultrabond 1, Ultrabond 2, or Ultrabond HS200: www.atcepoxy.com/#sle.
 - b. Euclid Chemical Company; DURAL FAST SET LV: www.euclidchemical.com/#sle.
 - c. Euclid Chemical Company; DURALFLEX GEL: www.euclidchemical.com/#sle.
 - d. Euclid Chemical Company; DURALFLEX LV: www.euclidchemical.com/#sle.
 - e. Euclid Chemical Company; DURAL 452 GEL, DURAL 452 LV, or DURAL 452 MV: www.euclidchemical.com/#sle.
 - f. Dayton Superior Corporation; Slow Set Bonding Agent: www.daytonsuperior.com/#sle.
 - g. Sika Corporation; Sikadur 31 Hi Mod Gel or Sikadur 32 Hi Mod Bonder: www.us.sika.com.
 - h. Simpson Strong-Tie; FX-752 Epoxy Bonding Agent, FX-762 High-Modulus Epoxy Bonding Agent, FX-792LPL Long Pot Life Epoxy Bonding Agent: www.strongtie.com
 - i. SpecChem, LLC; SpecPoxy 1000, SpecPoxy 2000, SpecPoxy 3000, or SpecPoxy 3000FS: www.specchemllc.com/#sle.
 - j. W. R. Meadows, Inc; Rezi-Weld Gel Paste, Rezi-Weld Gel Paste State, Rezi-Weld 1000: www.wrmeadows.com/#sle.
 - k. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Acetate Bonding Agent: Non-redispersable polyvinyl acetate.
1. Interior only except areas exposed to moisture
 2. Manufacturers:
 - a. Dayton Superior Corp.; PVA Bonding Agent J41: www.daytonsuperior.com
 - b. Euclid Chemical Co.; Tammsweld: www.euclidchemical.com.
 - c. L&M Construction Chemicals, Inc.; Everweld II: www.lmcc.com.
 - d. Larsen Products Corp; Weldcrete: www.larsenproducts.com/#sle.
 - e. W.R. Meadows, Inc.; Deck-O-Weld: www.wrmeadows.com.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Waterstops: PVC, complying with COE CRD-C 572.
1. Configuration: Flatted Ribbed or Split Flange, as indicated on the drawings, or as recommended by manufacturer.
 2. Size: 4 inch or as indicated on the drawings.
 3. Manufacturers:
 - a. Greenstreak; Flat Ribbed number 781 and Split Flange 721: www.greenstreak.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Waterstops: Bentonite and butyl rubber, complying with NSF 61 and NSF 372.
- G. Waterstops, Chemical-Resistant: Extruded, thermoplastic, virgin rubber; no recycled or reclaimed material or pigments allowed.

- H. Waterstops: Synthetic rubber; swells to 1000 percent of original size in clean water.
- I. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
 - 1. Material: Closed-cell, non-absorbent, compressible polymer foam in sheet form.
 - 2. Manufacturers:
 - a. W. R. Meadows, Inc; Deck-O-Foam Joint Filler with pre-scored top strip: www.wrmeadows.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- J. Interior Control Joint Filler for Sawcut joints in storage areas, loading dock floors, food processing areas:
 - 1. Semi-rigid, two component, 100 percent solids, gray epoxy with Shore A hardness not less than 80 when tested according to ASTM D2240.
 - 2. Sand Fill: Clean fine aggregate silica sand, as recommended by joint filler manufacturer.
 - 3. Acceptable Manufacturers:
 - a. Euclid Chemical Company; Euco 700: www.euclidchemical.com.
 - b. Metzger/McGuire; Spal Pro XL,: www.metzgermcguire.com.
 - c. Sika Corporation; Sikadur 52 SL or NS: www.us.sika.com.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- K. Slab Contraction Joint Device: Preformed linear strip intended for pressing into wet concrete to provide straight route for shrinkage cracking.
 - 1. Manufacturers:
 - a. W. R. Meadows, Inc; Speed-E-Joint: www.wrmeadows.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- L. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.
 - 1. Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.
 - 2. Height: To suit slab thickness.

2.07 CURING MATERIALS

- A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
 - 1. Manufacturers:
 - a. Atlas Tech Products Division of Atlas Construction Supply, Inc.;; Atlas Finish-Film: www.atlastechproducts.com.
 - b. Dayton Superior Corporation; AquaFilm Concentrate J74: www.daytonsuperior.com/#sle.
 - c. Euclid Chemical Company ; EUCOBAR: www.euclidchemical.com/#sle.
 - d. Nox-Crete Inc; Monofilm: www.nox-crete.com/#sle.

- e. Master Builder Solutions by BASF; MasterKure ER 50: www.master-builders-solutions.basf.us.
 - f. Nox-Crete Products Group; Monofilm: www.nox-crete.com
 - g. Sika Corp.; SikaFilm: usa.sika.com.
 - h. SpecChem, LLC; SpecFilm Concentrate or SpecFilm: www.specchemllc.com/#sle.
 - i. W. R. Meadows, Inc ; Evapre or Evapre-RTU: www.wrmeadows.com/#sle.
 - j. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
- 1. Application: Use at concrete slab on grade.
 - 2. Product dissipates within 4 to 6 weeks.
 - 3. Provide product containing fugitive red dye.
 - 4. Manufacturers:
 - a. Dayton Superior Corporation: www.daytonsuperior.com/#sle.
 - b. Euclid Chemical Company; COLOR-CRETE CURE AND SEAL VOC: www.euclidchemical.com/#sle.
 - c. SpecChem, LLC; SpecRez: www.specchemllc.com/#sle.
 - d. Paul M. Wolff Co.; SHUR-CURE: www.paulwolffco.com.
 - e. W. R. Meadows, Inc; 1100-Clear: www.wrmeadows.com/#sle.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Curing and Sealing Compound, Moisture Emission-Reducing, Membrane-Forming: Liquid, membrane-forming, clear sealer, for application to newly-placed concrete; capable of providing adequate bond for flooring adhesives, initially and over the long term; with sufficient moisture vapor impermeability to prevent deterioration of flooring adhesives due to moisture emission.
- 1. Use this product to cure and seal all slabs to receive adhesively applied flooring or roofing.
 - 2. Comply with ASTM C309 and ASTM C1315 Type I Class A.
 - 3. VOC Content: Less than 100 g/L.
 - 4. Manufacturers:
 - a. Obex; Creteseal CS2000: www.obexco.com.
 - b. Floor Seal Technology, Inc; VaporSeal 309 System: www.floorseal.com/#sle.
 - c. Nox-Crete Inc; Cure & Seal 1200E: www.nox-crete.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
- 1. Application: Use at areas without floor coverings.
 - 2. Solids by Mass: 25 percent, minimum.
 - 3. VOC Content: OTC compliant.
 - 4. Manufacturers:

- a. SpecChem, LLC; Cure and Seal WB 25: www.specchemllc.com.
 - b. Paul M Wolff Company; Shur-Seal: www.paulwolff.com
 - c. W. R. Meadows, Inc; CS-309-25: www.wrmeadows.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Curing and Sealing Compound, High Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
- 1. Application: Use at at food service areas without other floor coverings.
 - 2. Vehicle: Solvent-based.
 - 3. VOC Content: Ozone Transport Commission (OTC) compliant.
 - 4. Manufacturers:
 - a. SpecChem, LLC; Cure and Seal WB 30: www.specchemllc.com/#sle.
 - b. Paul M Wolff Company; Thermosheen: www.paulwolff.com
 - c. W. R. Meadows, Inc; VOCOMP-30: www.wrmeadows.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Moisture-Retaining Sheet: ASTM C171.
- 1. Curing paper, regular.
 - 2. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch.
 - 3. White-burlap-polyethylene sheet, weighing not less than 3.8 ounces per square yard.
- G. Water: Potable, not detrimental to concrete.

2.08 CONCRETE MIX DESIGN

- A. Mix Design: Contractor shall coordinate with the Testing Laboratory of Record, under supervision of Civil Engineer licensed in the State of California, to determine mix proportions to fulfill specified requirements for strength, aggregate, size and workability of concrete.
- B. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
 - 1. Comply with Chapter 19A requirements.
- C. Proportioning Structural Lightweight Concrete: Comply with ACI 211.2 recommendations and requirements.
- D. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- E. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
- F. Normal Weight Concrete:
 - 1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on Structural Drawings.
 - 2. Proportions: For normal weight concrete, in accordance with ACI 301, and as noted on the Drawings.

3. Structural Concrete: Structural concrete strengths (including non-structural floor slabs on grade), aggregate sizes and slumps indicated on Structural Drawings.
 4. Water/Cement Ratio for Concrete in Contact with Soil: Not to exceed 0.45, unless otherwise indicated on Structural Drawings.
 5. Water-Cement Ratio: As indicated on Structural Drawings.
 6. Maximum Slump: As indicated on Structural Drawings.
 7. Maximum Aggregate Size: As indicated on Structural Drawings.
- G. Structural Lightweight Concrete:
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
 2. Water/Cement Ratio: Not to exceed ratio indicated on Structural Drawings.
 3. Total Air Content: 3 percent, determined in accordance with ASTM C173/C173M.
 4. Maximum Slump: As indicated on Structural Drawings.
 5. Maximum Aggregate Size: As indicated on Structural Drawings.
 6. Maximum dry unit weight: As indicated on Structural Drawings.
 7. Maximum coarse aggregate absolute volume is limited to 9.0 CF/CY concrete.

2.09 MIXING

- A. Transit Mixers: Comply with ASTM C94/C94M.
- B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.
- B. Layout construction and control joints according to the drawing details and plans following these guidelines:
 1. Finished exposed concrete floors are critical for aesthetics.
 2. Layout joints on exposed concrete floors to allow for installation of utilities without sawcutting or concrete placement of different production batches subject to different colors. Staining and integral color concrete is not exempt from this requirement.
 3. Architect to review joint pattern submittal each floor.
 4. No lengthwise joints in corridors; place cross-corridor, if required.
 5. Place joint at 90 degree wall corners.
 6. Place joints at center line of columns.
 7. Equally space all joints.
- C. Verify that concrete cover requirements are met in formwork construction and reinforcement placement.

- D. Verify that base material (sand, gravel or natural as specified or indicated on Drawings) level, vapor barrier/retarder properly placed and that required clearances to reinforcing steel have been maintained.
- E. Verify that all embedded products and formed openings and recesses are correctly placed.
- F. At slabs on grade, verify that vapor retarder/barrier is properly placed and free of damage.

3.02 PREPARATION

- A. Verify that forms are clean and free of rust before applying release agent.
- B. Prepare previously placed concrete by cleaning with hydro-blasting or wet sand blasting to provide suitable surface for bonding. Provide minimum aggregate exposure of 1/4 inch.
- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
 - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
 - 2. Use latex bonding agent only for non-load-bearing applications.
- E. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
 - 1. See Section 072616 - Under-Slab Vapor Retarder.
 - 2. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as shown on the drawings. Do not use sand.
 - a. Install total thickness indicated on Drawings. Provide crushed rock, 1/2 inch grading, clean washed, complying with ASTM C33/C33M.
 - b. Comply with CA Green Code Section 4.505.2.1 Capillary Break.

3.03 CONCRETE MIXING

- A. Concrete Mixing, General: Comply with ACI 318 as adopted by CBC, Title 24, Part 2, Chapter 19A and ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete. Introduce and mix admixtures in compliance with manufacturer's instructions and recommendations.

3.04 PLACING CONCRETE

- A. Notify District's Inspector and DSA at least 2 working days in advance of placing concrete.
- B. Place concrete in accordance with ACI 304R. General: Comply with ACI 318 as adopted by CBC, Title 24, Part 2, Chapter 19A and as follows:
 - 1. Schedule continuous placement of concrete to prevent the formation of cold joints.
 - 2. Ready mix concrete shall be delivered in accordance with ASTM C94/C94M. Concrete shall be placed within 90 minutes after start of mixing.

3. Provide construction joints if concrete for a particular element or component cannot be placed in a continuous operation.
 - a. Submit for review, proposed locations of joints prior to pouring. See Structural Drawings for additional requirements.
4. Deposit concrete as close as possible to its final location, to avoid segregation.
- C. Placement in Forms: Limit horizontal layers to depths which can be properly consolidated, but in no event greater than 24 inches.
 1. Consolidate concrete by means of mechanical vibrators, inserted vertically in freshly placed concrete in a systematic pattern at close intervals. Penetrate previously placed concrete to ensure that separate concrete layers are knitted together.
 2. Vibrate concrete sufficiently to achieve consistent consolidation without segregation of coarse aggregates.
 3. Do not use vibrators to move concrete laterally.
- D. Place concrete for floor slabs in accordance with ACI 302.1R. Schedule continuous placement and consolidation of concrete within planned construction joints.
 1. Place concrete in linear pattern, with control joints at slab on grade conditions only, with joints located as indicated on the Drawings.
 2. Thoroughly consolidate concrete without displacing reinforcement or embedded items, using internal vibrators, vibrating screeds, roller pipe screeds or vibrating laser screed as described below.
 3. Screeding Procedures: Strike off and level concrete slab surfaces before bleed water can collect on surface. Do not work concrete further until finishing operations are commenced.
 - a. Typical Slabs: Strike off and level surface using highway straight edges, darbies or bull floats.
 4. Create control and construction joints true to line and profile. Do not radius the joints. Refer to the Drawings for structural requirements of joints.
 5. Sawcut control joints to one-quarter of slab depth, immediately after slab has achieved initial set and not longer than 8 hours. "Soff-Cut" method is preferred.
 6. Alternate control and construction joint products and procedures will be considered in accordance with substitution provision specified in Section 01 60 00 - Product Requirements.
- E. Notify Architect not less than 48 hours prior to commencement of placement operations.
- F. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- G. Ensure reinforcement, inserts, and waterstops are not disturbed during concrete placement.
- H. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
- I. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 SLAB JOINTING

- A. Locate joints as indicated on the approved joint layout shop drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
 - 1. Install where indicated and required on Structural Drawings, to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.
- D. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.
- E. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.
- F. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.
- G. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- H. Separate slabs on grade from vertical surfaces with joint filler.
- I. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- J. Install joint devices in accordance with manufacturer's instructions.
- K. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- L. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- M. Place concrete continuously between predetermined expansion, control, and construction joints.
- N. Do not interrupt successive placement; do not permit cold joints to occur.
- O. Hot Weather Placement: Comply with recommendations of ACI 305R when ambient temperature before, during, or after concrete placement is expected to exceed 90 deg F or when combinations of high air temperature, low relative humidity, and wind speed are such that the rate of evaporation from freshly poured concrete would otherwise exceed 0.2 lbs./SF/Hr..
 - 1. Use evaporation reducer.
 - 2. Do not add water to approved concrete mixes under any conditions.
 - 3. Provide mixing water at lowest feasible temperature, and provide adequate protection of poured concrete to reduce rate of evaporation.
 - 4. Use fog nozzle to cool formwork and reinforcing steel immediately prior to placing concrete.

- P. Cold-Weather Placement: Comply with provisions of ACI 306R when air temperature has fallen to or is expected to fall below 40 deg F. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. Uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- Q. Protection: Ensure that reinforcement, embedded products, joint fillers and joint devices are not disturbed during concrete placement.
- R. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure, as acceptable to Architect.
 - 1. Locate construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.
 - a. Dowel Joints: As indicated on Drawings.
 - 2. Hydro wash joint to 1/4 inch aggregate exposure, followed by wet process sandblast or second hydrowash.
 - 3. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- S. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, or as indicated.
 - 1. Structural slab contact at foundation walls and grade beams shall be doweled as detailed.
- T. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown.

3.06 SEPARATE FLOOR TOPPINGS

- A. Prior to placing floor topping, remove deleterious material. Broom and vacuum clean.
- B. Place required dividers, edge strips, and other items to be cast in.
- C. Apply bonding agent to substrate in accordance with manufacturer's instructions.
- D. Apply sand and cement slurry coat on base course, immediately prior to placing toppings.
- E. Place concrete floor toppings to required lines and levels.
 - 1. Place topping in checkerboard panels not to exceed 20 feet in either direction.
- F. Screed toppings level, maintaining surface flatness of maximum 1:1000.

3.07 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. An independent testing agency, as specified in Section 01 40 00, will inspect finished slabs for compliance with specified tolerances.
- B. Maximum Variation of Surface Flatness:

1. Exposed Concrete Floors: 1/4 inch in 10 feet, non-cumulative.
 2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
 3. Under Carpeting: 1/4 inch in 10 feet.
 4. For the following applications, depressions in slab floors between high spots shall be a maximum 1/8 inch in 10 ft., using a metal straight edge placed at any location on slab, and measured within 72 hours of pour.
 - a. Slabs receiving thin-set ceramic tile as specified in Section 09 30 00 - Tiling.
 - b. Additional floor finishes may require similar tolerances that are not noted here. Refer to individual sections for their requirements.
 5. Curbs:
 - a. Top of Curb: 1/4 inch in 10 ft, non-cumulative.
 - b. Side of Curb: 1/8 inch in 10 ft, non-cumulative, vertical and horizontal.
- C. Correct the slab surface if tolerances are less than specified.
- D. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.08 CONCRETE FINISHING

- A. Repair surface defects, immediately after removing formwork.
1. Remove honeycombed areas and other defective concrete down to sound concrete, cutting perpendicular to surface or slightly undercutting without damaging reinforcement. Dampen patch location and area immediately surrounding it prior to applying bonding compound or patching mortar.
 2. Before bonding compound has dried, apply patching mixture matching original concrete in materials and mix except for omission of coarse aggregate, and using a blend of white and normal portland cement as necessary to achieve color match. Consolidate thoroughly and strike off slightly higher than surrounding surface.
- B. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
1. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.
- C. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

3.09 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
1. Normal concrete: Not less than seven days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces Not in Contact with Forms:
1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive

manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.

2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water-fog spray or saturated burlap.
 - a. Spraying: Spray water over floor slab areas and maintain wet.
 - b. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
3. Final Curing: Begin after initial curing but before surface is dry.
 - a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.
 - b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.10 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures for passage of Work specified in other Sections, after such Work is in place. Mix, place, and cure concrete as specified to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete Work. Use non-shrink grout where required or indicated.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

3.11 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- D. Field Certifications: For all concrete, provide signed copy of batch plant's certificate stating quantity of each material, amount of water, admixtures, departure time and date accompanying each load of materials or concrete.
- E. Field Tests of Concrete: Perform tests in accordance with applicable California Building Code requirements, ACI 301 and requirements of authorities having jurisdiction.
- F. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- G. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure four concrete test cylinders. Obtain test samples for every 2,000 sq ft - 50 cu yd or less of slab and structural concrete of each class of concrete placed (CBC requirement).

1. Test one cylinder at 7 days and two at 28 days after placement.
 2. Maintain fourth cylinder to be tested at 56 days only if 28-day test fails to meet strength requirement.
 3. Take one additional test cylinder during cold weather concreting and cure it at job site under same conditions as concrete it represents. Test cold weather cylinder at 28 days.
- H. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- I. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.
- J. Slab Testing: Cooperate with manufacturer of specified moisture vapor reducing admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.

3.12 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
1. Obtain repair details from Architect (Structural Engineer) and approved by DSA before proceeding.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.13 PROTECTION

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.
- B. Protect concrete from marring and damage due to weather and construction activities.
1. Protective measures shall include providing temporary coverings, and be in accordance with Section 01 50 00 - Temporary Facilities and Controls, and shall prohibit all non-essential construction activities, including cleaning and maintenance of construction equipment.
 2. In particular, protect concrete floor slabs from oil, paint and other products that might penetrate and degrade concrete surface.

END OF SECTION

SECTION 05 05 19
POST-INSTALLED CONCRETE ANCHORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements for materials and equipment for post-installed mechanical and adhesive anchors in concrete.

1.02 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- B. Section 01 45 33 - Code-Required Special Inspections: Test reporting.
- C. Section 01 60 00 - Product Requirements: Requirements for material and product quality.
- D. Section 03 30 00 - Cast-in-Place Concrete: Placement of anchors in concrete.
- E. Section 05 50 00 - Metal Fabrications.
- F. Divisions 10 - Specialties, 22 - Plumbing, and 26 - Electrical: Mounting of equipment and components.
- G. Other miscellaneous sections, where indicated.

1.03 REFERENCE STANDARDS

- A. ASTM A193/A193M - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
- B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
- D. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
- E. ASTM E488/E488M - Standard Test Methods for Strength of Anchors in Concrete Elements.
- F. ASTM F594 - Standard Specification for Stainless Steel Nuts.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: If requested, manufacturer's product literature and installation instructions for each type of anchor indicated.
- C. Samples: If requested, representative length and diameters of each type of anchor shown on the drawings.
- D. ICC ES Reports: If requested, ICC Evaluation Service report indicating conformance with ICC-ES Acceptance Criteria.
- E. Field quality-control test and inspection reports.

1.05 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency qualified according to ASTM E329 and Section 01 45 33 for testing indicated.
- B. Installer Training: Prior to beginning the work, manufacturer or manufacturer's representative shall provide on-site training for all contractor's personnel who will be installing anchors.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in manufacturer's or distributor's original packaging undamaged, and with printed installation instructions.
- B. Store and handle all materials in accordance with manufacturer's recommendations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Provide products as indicated on the approved Structural Drawings.
- B. Substitutions: Substitutions of products from manufacturer's not listed are not permitted.
 - 1. Substitution of structural anchors requires structural calculations and DSA approval.

2.02 MATERIALS

- A. Interior Use: For use in conditioned environments free from potential moisture, provide zinc plated carbon steel anchors.
- B. Exterior Use:
 - 1. In exposed or potentially wet environments, and for attachment of exterior cladding materials, provide stainless steel anchors.
 - 2. Stainless steel nuts and washers shall be of matching alloy group of equal or greater strength than the rod.
 - 3. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.
- C. Deformed Reinforcing Bars: Deformed steel rebar conforming to ASTM A615/A615M Grade 60. Permissible sizes as described in each adhesive products ICC report.

2.03 MECHANICAL ANCHORS

- A. Expansion, screw or undercut anchors having current ICC approval for use in cracked and uncracked concrete, with a published ICC Evaluation Service report.
 - 1. Type and size as indicated on drawings.
- B. Basis of Design Approved Products conforming to this specification are acceptable for anchoring to concrete are as indicated on Drawings:
 - 1. Hilti, Inc. Tulsa, OK; Hilti Kwik Bolt TZ Carbon and Stainless Steel Anchors in Cracked and Uncracked Concrete (ICC Report ESR-1917); www.us.hilti.com.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.

- C. Basis of Design Approved Products conforming to this specification are acceptable for anchoring to grouted masonry are as follows:
 - 1. Simpson Wedge-All Wedge Anchor (ICC-ES ESR-1396)
 - 2. Hilti Kwik Bolt 3 Expansion Anchor (ICC-ES ESR-1385)
 - 3. Hilti Kwik Bolt TZ Expansion Anchor (ICC-ES ESR-3785)
 - 4. Simpson Titen HD Screw Anchor (ICC-ES ESR-1056)
 - 5. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 ADHESIVE ANCHORS

- A. Cartridge Injection Adhesive Anchors: Threaded carbon steel rod, inserts, or reinforcing dowels complete with required nuts, washers, adhesive system and manufacturer's installation instructions.
 - 1. Type and size as indicated on drawings.
 - 2. Current ICC approval for use in cracked and uncracked concrete with a published ICC Evaluation Service report required.
- B. Interior Use: Unless otherwise indicated on the Drawings, provide:
 - 1. Carbon steel threaded rods conforming to specification as indicated on structural drawings. Where no specification and grade are indicated, provide: ASTM A193/A193M Type B7 with zinc plating in accordance with ASTM B633, Type III Fe/Zn 5 (SC1).
- C. Exterior Use: As indicated on the Drawings, provide stainless steel anchors.
 - 1. Stainless steel anchors shall be AISI Type 304 and Type 316 stainless steel provided with stainless steel nuts and washers of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener.
 - 2. All nuts shall conform to ASTM F594, unless otherwise specified.
- D. Basis of Design Approved Products conforming to this specification are acceptable for anchoring to concrete are as indicated on Drawings:
- E. Basis of Design Approved Products conforming to this specification are acceptable for anchoring to grouted masonry are as indicated on Drawings:

2.05 POWER-DRIVEN/POWDER ACTUATED FASTENERS

- A. Use only if approved by Architect, generally not permitted where not specifically indicated or in load-bearing installations; as follows.
 - 1. Hilti, Inc.; Hilti Low Velocity Power Driven Fasteners (ICC Report ESR-1663); www.us.hilti.com.
 - 2. Simpson Strong-Tie Company, Inc.; Simpson Strong-Tie® Powder-Actuated Fasteners, Threaded Studs and Assemblies (ICC Report ESR-2138); www.strongtie.com.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions

1. Base Material Strength: Unless otherwise specified, do not drill holes in concrete until concrete has achieved full design strength.
 - a. Adhesive anchors shall be installed in concrete having a minimum concrete compressive strength equal to or greater than the specified minimum 28-day compressive strength or a minimum age of 21 days at time of anchor installation. Whichever are more restrictive.
2. Temperature of concrete surface and ambient air temperature must meet manufacturer's requirements prior to use of adhesive anchor products.
3. Embedded Items:
 - a. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors.
 - b. Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items.
 - c. Take precautions as necessary to avoid damaging anything embedded in the concrete including electrical/telecommunications conduit, gas pipes, and plumbing pipes.
 - d. Notify the Architect if reinforcing steel or other embedded items are encountered during drilling.
4. Beginning of installation indicates acceptance of existing conditions.

3.02 INSTALLATION

- A. Installation shall comply with all manufacturer's instructions and current ICC ESR report.
- B. Post-Installed Anchors in Hardened Concrete.
 1. Drilled-in anchors and/or powder driven pins in existing non-prestressed reinforced concrete: use care and caution to avoid cutting or damaging the existing reinforcing bars.
 2. Maintain a minimum clearance of one inch between the reinforcement and the drilled-in anchor and/or pin.
- C. Manufacturer shall provide on-site training for all personnel who will be installing post-installed adhesive anchors at the beginning of the work. Installation of anchors must be performed by a certified installer.
- D. Where manufacturer recommends use of special tools for installation of anchors, such tools shall be used, unless otherwise permitted specifically by the Engineer.
- E. Drill holes with rotary impact hammer drills using carbide-tipped bits. Bits must be of type required and permitted by ICC ESR report.
 1. Drill holes with rotary impact hammer drills using carbide-tipped bits or core drills using diamond core bits.
 2. Drill bits shall be of diameters as specified by the anchor manufacturer.
 3. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the concrete surface.
 4. Where anchors are to be installed in cored holes, use core bits with matched tolerances as specified by the manufacturer.

5. Cored holes may only be used if acceptable to the Engineer and in compliance with ICC ESR report.
- F. Holes shall be cleared of debris after holes are drilled per manufacturer's instructions.
 1. For adhesive installations, at a minimum, holes shall be blown out with oil-free compressed air and shall be brushed with a wire or nylon brush.
 2. Holes shall than be blown out one additional time with oil-free compressed air.
 3. Additional hole cleaning requirements may be required by manufacturer and ICC ESR Report.
- G. During adhesive curing time period, the temperature of the substrate shall be kept above the minimum substrate temperature as defined by the manufacturer. Contractor shall determine the appropriate means and methods to ensure that the temperature is kept above the required minimum temperature required before adhesive installation is begun.

3.03 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 45 33 - Code-Required Special Inspections.
- B. Inspection: Special inspection of post-installed anchors shall be provided as required by the ICC-ES report for that anchor and not less than the requirements of the Structural Drawings and the following (whichever is the most restrictive):
 1. Continuously observe the installation of all anchors, or as specified in the ICC report.
 - a. Minimum anchor embedments, proof loads and torques shall be as shown on the Drawings.
 - b. Load Testing: Per Structural General Notes on Drawings.
 - c. Post-Installed Anchor Load Testing: CBC Section 1910A.5.
 - 1) As indicated on Structural Drawings, minimum 10 % of drilled-in sill plate bolting anchor applications shall be proof loaded by the independent testing laboratory.
 - 2) 100 % of each type and size of drilled-in anchor shall be proof loaded by the independent testing laboratory.
 - 3) Adhesive anchors and capsule anchors shall not be torque tested unless otherwise directed by the Architect.
 - 4) Tension testing should be performed in accordance with ASTM E488/E488M.
 - 5) Torque shall be applied with a calibrated torque wrench.
 - 6) Proof loads shall be applied with a calibrated hydraulic ram, as required and indicated on the Structural Drawings. Comply with CBC 1910A.5.5.
 - 7) If any of the tested anchors fail to achieve the specified torque or proof load within the limits as defined on the Drawings, all anchors of the same diameter and type as the failed anchor shall be tested, unless otherwise instructed by the Architect.
 - d. Verify anchor type, anchor dimensions, hole dimensions, anchor spacing, edge distances, anchor embedment and adherence to the manufacturer's published installation instructions.
 - e. For adhesive anchors also verify hole cleaning technique, adhesive expiration date and proper mixing and dispensing.

2. Subsequent inspection of installation will be required when there is a change of personnel doing the installation. Change is defined as any one or more persons drilling or preparing holes, or installing anchors.
 3. Visually inspect 100% of all installed anchors.
- C. Reporting:
1. Daily reports shall reference the applicable ICC-ES report number, indicate that all specified criteria were complied with and provide itemized verification of all inspected items.
 2. Special Inspector shall immediately report any deviations from the requirements to the Architect.
- D. Defective Work:
1. Installations that are not accepted by the Special Inspector shall be considered defective.
 2. Provide additional testing and inspection to determine acceptability of defective work, as directed by the Architect at Contractor's expense.

3.04 REPAIR OF DEFECTIVE WORK

- A. Remove and replace misplaced, defective or malfunctioning anchors at Contractor's expense. Replacement of anchors requires signed structural detail, unless otherwise noted.
- B. Fill empty anchor holes and patch failed anchor locations with high-strength, non-shrink non-metallic grout.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated steel items.
 - 1. Custom fabricated gate and fence.
- B. Pipe bollards with sleeve covers.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 050519 - Architectural Vinyl Graphic Films: Placement of metal anchors in concrete.
- C. Section 05 12 00 - Structural Steel Framing: Structural steel column anchor bolts.
- D. Section 09 91 13 - Exterior Painting: Paint finish.
- E. Section 09 91 23 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

- A. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
- F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- G. ASTM A588/A588M - Standard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi (345 MPa) Minimum Yield Point, with Atmospheric Corrosion Resistance.
- H. ASTM A606/A606M - Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
- I. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- J. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- K. ASTM A847/A847M - Standard Specification for Cold-Formed Welded and Seamless High-Strength, Low-Alloy Structural Tubing with Improved Atmospheric Corrosion Resistance.
- L. ASTM A992/A992M - Standard Specification for Structural Steel Shapes.

- M. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
- N. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.
- O. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
- P. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification.
- Q. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- R. AWS D1.2/D1.2M - Structural Welding Code - Aluminum.
- S. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel.
- T. SSPC-PA 1 - Shop, Field, and Maintenance Painting of Steel.
- U. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer.
- V. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").
- W. SSPC-SP 3 - Power Tool Cleaning.
- X. SSPC-SP 5 - White Metal Blast Cleaning.
- Y. SSPC-SP 6 - Commercial Blast Cleaning.
- Z. SSPC-SP 10 - Near-White Blast Cleaning.
- AA. SSPC-SP 2 - Hand Tool Cleaning.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
- D. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172 or AISC 201.

1.05 QUALITY ASSURANCE

- A. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.
- B. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172 or AISC 201.
- C. Welder's Qualifications:
 - 1. Welding shall be performed by certified welders qualified in accordance with procedures specified in applicable referenced AWS standard, using materials, procedures and equipment of the type required for the Work.

2. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Conform to applicable requirements of California Building Code (CBC), Title 24, Part 2, as amended and adopted by authorities having jurisdiction.
 1. Comply with Title 24, Part 9, California Fire Code Chapter 35 "Welding and Other Hot Work."

2.02 MATERIALS - STEEL

- A. Structural Steel: ASTM A992/A992M.
 1. Galvanized Steel: From fully killed or semi-killed steel, except silicon content in the range 0 to 0.4 percent or 0.15 to 0.25 percent, as applicable, only.
- B. Steel Sections: ASTM A36/A36M, for channels, angles and plates.
- C. Steel Tubing: ASTM A500/A500M, Grade B cold-formed structural tubing.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Slotted Channel Framing: ASTM A653/A653M, Grade 33.
- F. Slotted Channel Fittings: ASTM A1011/A1011M.
- G. Weathering Steel: Corten B, ASTM A588/A588M and/or ASTM A606/A606M.
 1. Up to 3/16 inch: ASTM A606/A606M.
 2. 3/16 inch to 5 inch: ASTM A588/A588M.
 3. Tube: ASTM A847/A847M.
- H. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.
- I. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.
- J. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
- K. Bolts, Nuts, and Washers: As indicated on Drawings.
- L. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- M. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
 1. Comply with SSPC-PA 1. Coordinate with requirements specified in Section 09 91 13 - Exterior Painting and 09 91 23 - Interior Painting .
 - a. Coordinate primer with finish paint and coating, as applicable, to provide sound foundation for field-applied topcoats despite prolonged exposure during construction.
- N. Galvanize all exterior steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating.

- O. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATION

- A. Ferrous Metal Surfaces, General:
 - 1. For metal fabrications exposed to view upon completion of the Work: Provide ferrous metals materials selected for their surface flatness, smoothness, and freedom from surface blemishes.
 - 2. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.
- B. Hot-dip galvanize fabricated ferrous items, indicated as remaining unpainted, after fabrication. Field connections shall be bolted or screwed where possible. Avoid field cutting and welding which damage galvanized coating.
- C. Fit and shop assemble items in largest practical sections, for delivery to site.
- D. Fabricate items with joints tightly fitted and secured.
- E. Gas cutting of non-structural steel items may be acceptable where stress is not transmitted through flame-cut surfaces.
 - 1. Make cuts clean and to contour.
 - 2. Deduct 1/8 inch from effective width of members cut by torch.
- F. Continuously seal joined members by intermittent welds and plastic filler.
- G. Joints Exposed to Weather or Water: Fabricate to keep water out, or provide adequate drainage of water that penetrates.
- H. Steel Tubing and Piping Fabrication: Unless otherwise indicated, close ends with plate stock so no exposed ends of tubing and piping. Grind all edges.
- I. Connections, General:
 - 1. Component parts of built-up members shall be well-pinned with closely-fitted contact.
 - 2. Conceal connections where possible.
 - 3. Otherwise, make countersinks for concealment after fabrication, except where noted.
- J. Welding: Conform to AWS D1.1/D1.1M recommendations.
 - 1. Do not field weld galvanized components to remain unfinished.
 - 2. Provide continuous welds at welded corners and seams.
 - 3. Grind exposed welds smooth and flush with base material.
 - 4. Re-weld to fill holes. Putties and fillers are not acceptable.
- K. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- L. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
 - 1. Bolted and Screwed Connections:
 - a. Provide holes and connections for work specified in other Sections.

- b. Use bolts for field connections only.
 - c. Provide washers under heads and nuts bearing on wood.
 - d. Draw all nuts tight and nick threads of permanent connections.
 - e. Use beveled washers where bearing is on sloped surfaces.
 - f. Where screws must be used for permanent connections in ferrous metal, use flat head type, countersunk, with screw slots filled and finished smooth and flush.
- M. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATED ITEMS

- A. Rough Hardware
- 1. Provide bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as indicated on Drawings.
- B. Other Products and Fabrications
- 1. Other Products and Fabrications: Provide all materials not specifically described but required for a complete and proper installation, as selected by the Contractor, subject to review and acceptance by Construction Manager and Architect.
- C. Bollards: Steel pipe, concrete filled, as detailed; galvanized finish.
- 1. Bollard Sleeve Covers:
 - a. Manufacturer:
 - 1) Encore Commercial Products, Inc.: www.postguard.com.
 - 2) Substitutions: See Section 01 60 00 - Product Requirements.
 - b. Performance Requirements
 - 1) Ultraviolet Protection Additive. Six (6) Year UV stabilizer package. Warranty 6 Years.
 - 2) Thickness: 0.125 inch nominal wall thickness.
 - 3) Abrasion Resistant.
 - 4) Environmental Stress Cracks Resistant.
 - 5) Reflective Tape: Each sleeve cover to have 2 strips of Reflective tape recessed on the part 5.875 inches apart.
 - 6) Flexural Modulus: 200,000 psi.
 - 7) Tensile Strength: 4,000 psi.
 - c. Materials:
 - 1) HDPE and LDPE Polyethylene:
 - (a) Size: Determined by pipe size and height as indicated on Drawings.
 - (b) Standard colors: As selected by Architect (Yellow, White, Blue, Red, Black, Gray, Green, Orange, Brown, Beige, Royal Blue, Canadian Grey, Warm Grey, Lime Green).
 - (c) Reflective Tape Color: As selected by Architect (Red, White, Yellow, Black, Green and Blue).
- D. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.

- E. Lintels: As detailed; prime paint finish.
- F. Door Frames for Overhead Door Openings and Wall Openings: Channel sections; prime paint finish.
- G. Slotted Channel Framing: Fabricate channels and fittings from structural steel complying with the referenced standards; electro-galvanized per ASTM B633, Type III, SC 1 finish.
- H. Perforated Metal Panel:
 - 1. Manufacturers:
 - a. Hendrick Architectural: www.hendrickcorp.com.
 - b. Accurate Perforating: www.accurateperf.com.
 - c. McNichols: www.mcnichols.com.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
 - 2. Materials:
 - a. Galvanized Steel, ASTM A123/A123M, G90.
 - 3. Galvanized Thickness: 20 gauge, 0.0396 inch.
 - 4. Custom perforation to create a graphic based on artwork provided by Architect.
 - 5. Finish: Field painted.
- I. Enclosure Gates:
 - 1. Fabricated steel shapes as detailed on Drawings, hot-dipped galvanized finish after fabrication, with galvanized perforated steel panel infill.
 - 2. Steel Face Panels for Gates:
 - a. Corrugated Panels: 18 gage galvanized steel box-rib style decking, 1-1/2 inches deep; ASC Steel Deck Division of ASC Profiles, Inc., or equal.
 - 3. All welded construction.
 - 4. Hardware: Welded on heavy duty butt hinges, minimum 4-hinges per leaf, latch device mounted 40 inches above finish surface and including padlock eye, drop rod with steel pipe receivers cast into concrete at both open and closed positions (both leaves).
 - 5. At Pedestrian Gate: Provide 16 gage steel sheet kick plate on push side of gate up to a minimum of 10 inches above finish surface.
 - a. Connect kick plates with a 16 gage closure placed on top of kick plates; from front to back plates and side to side. Overlap to outside on top of kick plates a minimum 1/2 inch. Tack or spot weld as required.
 - b. Kick plate to have drain holes in back face to minimize collection of water in bottom of angle frame.
 - c. See also Section 32 31 13 - Chain Link Fences and Gates or 32 31 19 - Decorative Metal Fences and Gates.

2.05 FINISHES - STEEL

- A. Mechanical Finishes: Complete finishing prior to fabrication wherever possible.
 - 1. After fabrication, finish all joints, bends, abrasions, and other surface blemishes to match finish.
 - 2. Protect finish on exposed surfaces by using temporary protective covering.

- B. Prime paint steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- C. Prepare surfaces to be primed in accordance with SSPC-SP2.
 - 1. Exterior fabrications: Clean in accordance with SSPC-SP 5, SSPC-SP 6, 8, or SSPC-SP 10.
 - 2. Interior fabrications: Clean in accordance with SSPC-SP 2, SSPC-SP 3, SSPC-SP 5, SSPC-SP 6, 8, or SSPC-SP 10.
- D. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- E. Prime Painting: One coat.
- F. Galvanizing of Structural Steel Members: Galvanize all exterior steel members after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.
- G. Galvanizing of Non-structural Items: Galvanize all exterior steel members after fabrication to ASTM A123/A123M requirements.

2.06 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.
- F. Punch, drill and reaming in manner to leave clean, true lines and surfaces.
 - 1. Oversize hole 1/16 inch by punching, when material thickness is equal to or less than bolt diameter plus 1/8 inch.
 - 2. Sub-punch 1/16 inch smaller than bolt and drill or ream to oversize by 1/16 inch, when material thickness is thicker than bolt diameter plus 1/8 inch.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Field Inspection of Fabricated Products: Prior to installation, inspect products for damage and verify markings and dimensions against reviewed submittals.
- C. Environmental Conditions: Do not install products intended for interior locations when spaces are uncovered and unprotected from inclement weather.
- D. Coordination: Coordinate metal fabrications Work with Work specified in other Sections so that related Work shall be accurately and properly joined.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete.
- C. Make provision for erection loads with temporary bracing. Keep work in alignment.
- D. Obtain Architect's review prior to site cutting or making adjustments not indicated on Drawings and reviewed shop drawings.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
 - 1. Touch up galvanized steel with cold galvanizing compound.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 05 52 13
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Balcony railings and guardrails.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Placement of anchors in concrete.
- B. Section 05 50 00 - Metal Fabrications: Embedded items, welding and shop painting.
- C. Section 09 21 16 - Gypsum Board Assemblies: Placement of backing plates in stud wall construction.
- D. Section 050519 - Architectural Vinyl Graphic Films: Placement of anchors in concrete.

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- E. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- F. NAAMM AMP 521 - Pipe Railing Systems Manual.
- G. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
 - 1. Prepare shop drawings for all railing systems, including attachment.
 - 2. Conform to AISC Standards, except provisions for approval/responsibility for dimensions by Architect and structural engineer shall not apply.
 - 3. Include erection drawings, elevations, and details where applicable.
 - 4. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

1.05 QUALITY ASSURANCE

- A. Welder's Qualifications: Welding shall be performed by certified welders qualified in accordance with procedures specified in AWS D1.1/D1.1M, using materials, procedures and equipment of the type required for this work.

- B. Fabricator Qualifications:
 - 1. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.
- C. Coordination: Provide templates and sleeves for incorporation of embedded items into the work specified elsewhere herein.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Delivery, Storage and Handling, General: Protect products from deformation, marring, discoloration, soiling and corrosion.
- B. Storage: Store products in enclosed, well-ventilated spaces, not in contact with soil or vegetation and not subject to inclement weather.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

- A. Regulatory Requirements: Conform to California Building Code (CBC), Title 24, Part 2, Section 11B-505 and 11B-405.8 as amended and adopted by authorities having jurisdiction.
 - 1. Top of gripping surfaces of handrails shall be 34 inches minimum and 38 inches maximum vertically above walking surfaces, stair nosings, and ramp surfaces. Handrails shall be at a consistent height above such surfaces.
 - 2. Clearance between handrail gripping surfaces and adjacent surfaces shall be 1-1/2 inches minimum.
 - a. Handrail may be located in a recess if the recess is 3 inches maximum deep and 18 inches minimum clear above the top of the handrail.
 - 3. Handrail gripping surfaces shall be continuous along their length and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not be obstructed for more than 20% of their length.
 - a. Where provided, horizontal projections shall occur 1-1/2 inches minimum below the bottom of the handrail gripping surfaces.
 - 4. Handrail gripping surfaces with a circular cross section shall have an outside diameter of 1-1/4 inch minimum and 2 inches maximum.
 - 5. Handrail gripping surfaces with a non-circular cross section shall have an outside dimension of 4 inches minimum and 6-1/4 inches maximum, and a cross-sectional dimension of 2-1/4 inches maximum.
 - 6. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.
 - 7. Handrails shall not rotate within their fittings.
 - 8. Handrail gripping surfaces shall extend beyond and in the same direction of stair flights and ramp runs in accordance with CBC Section 11B-505.10.
 - a. Such extensions are not required for continuous handrails at the inside turn of switchback or dogleg stairs and ramps.

9. A 2 inch minimum high curb or a barrier shall be provided to prevent the passage of a 4 inch diameter sphere rolling off the sides of a ramp surface.
 - a. Such a curb or barrier shall be continuous and uninterrupted along the length of a ramp. CBC Section 11B-405.9.2
- B. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
- C. Allow for expansion and contraction of members and building movement without damage to connections or members.
- D. Dimensions: See drawings for configurations and heights.
 1. Top Rails and Wall Rails: 1-1/2 inches outside diameter, round.
 2. Intermediate Rails: 1-1/2 inches diameter, round.
- E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 1. For anchorage to concrete, provide inserts to be cast into concrete, for welding anchors.
 2. For anchorage to stud walls, provide backing plates, for bolting anchors.
- F. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.02 STEEL RAILING SYSTEM

- A. Steel Tube: ASTM A500/A500M, Grade B cold-formed welded or seamless structural tubing.
- B. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black and galvanized finish, as indicated, seamless or welded.
- C. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- D. Exposed Fasteners: No exposed bolts or screws.
- E. Straight Splice Connectors: Steel concealed spigots.
- F. Galvanizing: In accordance with requirements of ASTM A123/A123M.
 1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.

2.03 FABRICATION

- A. Fabricate railings in accordance with NAAMM AMP 521 and as required for specified design requirements. Provide stock and tubing and manufactured components sized and arranged as indicated on Drawings and specified herein.
- B. Accurately form components to suit specific project conditions and for proper connection to building structure.
 1. Prior to fabrication, field verify dimensions and details of construction. Immediately report variances in writing to Architect.
- C. Fit and shop assemble components in largest practical sizes for delivery to site.

- D. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- E. Welded Joints:
 - 1. Exterior Components (Type 2): Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 - 2. Interior Components (Type 1): Continuously seal joined pieces by continuous welds.
 - 3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius (1/8 inch).

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Coordination: Coordinate fabrication and installation of steel pipe and tube railings so that related Work accurately and properly join.

3.02 PREPARATION

- A. Obtain Architect's review prior to site cutting or making adjustments not indicated on shop drawings.
- B. Supply items required to be cast into concrete with setting templates, for installation as work of other sections.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Install railings in compliance with CBC 11B and ADA Standards for accessible design at applicable locations.
- D. Anchor railings securely to structure.
- E. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.
- F. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- G. Guardrails Installation: Install railings plumb and level, accurately fitted, free from distortion or defects.
 - 1. Plumb posts in each direction.
 - 2. Temporarily install sections and align before securing sections together.
 - 3. Fully weld all joints and grind smooth as for shop welding.
 - 4. Perform field welding in accordance with AWS D1.1/D1.1M.

- H. Wall Railings Installation, General: Secure handrails to wall with wall brackets and end return fittings.
 - 1. Provide brackets with 1-1/2 inch clearance from inside face of handrail and finished wall surface.
 - 2. Locate brackets as indicated, or if not indicated, at spacing required to support structural loads.
 - 3. Secure wall brackets to building construction as specified below.
 - a. Secure railing to bracket with pre-drilled hole for exposed bolt anchorage.
 - b. Railing ends: None. Return railings to within 1/4 inch of wall face and provide handrail bracket within 12 inches of end of railing.
 - c. Securing Railings to Metal Stud Framed Walls: Anchor brackets and fittings directly to steel framing or to concealed sheet steel backing or to concealed anchors, using self-tapping screws of size and type necessary to support structural loads.

3.04 TOLERANCES

- A. Code required dimensions indicated on Drawings as minimum or maximum are absolute. No tolerances are allowed less or more than this dimension.
- B. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- C. Maximum Offset From True Alignment: 1/4 inch.
- D. Maximum Out-of-Position: 1/4 inch.

3.05 CLEANING AND PROTECTION

- A. Galvanizing Repair Compound:
 - 1. If finish is to be painted or is otherwise not visible, field repair with premixed cold galvanizing compound for field touch-up of galvanized coatings.
 - 2. Where the finish is galvanized, resend to galvanizing for reapplication, if practical (e.g.; bolted components) and accepted by Architect.
- B. Cleaning:
 - 1. Clean and dress all field welds, bolted connections, and abraded areas of galvanizing or shop paint on miscellaneous metal.

END OF SECTION

SECTION 06 05 73
WOOD TREATMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Site applied termiticide for wood materials.
- B. Site applied termiticide for other building materials.
- C. Site applied mildewcide for wood materials.
- D. Site applied fire-retardant treatment for wood materials.
- E. Site applied fire retardant for wood materials.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions .
- B. Section 03 30 00 - Cast-in-Place Concrete.
- C. Section 06 10 00 - Rough Carpentry: Factory treatment for wood products.

1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. AWPA U1 - Use Category System: User Specification for Treated Wood.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.
- C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in District's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Site Applied Termiticide and Mildewcide: Correct defective Work within a twenty-five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 SITE-APPLIED WOOD TREATMENT

- A. Manufacturers:
 - 1. Arch Wood Protection, Inc: www.wolmanizedwood.com.
 - 2. Green Products Company; Copper Green: greenproductsco.net.
 - 3. Nisus Corporation: www.nisuscorp.com/#sle.
 - 4. Osmose, Inc: www.osmose.com.
 - 5. Viance, LLC: www.treatedwood.com.
 - 6. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Site Applied Termiticide for Wood: Borate mineral salt based, spray applied, penetrating termiticide.
 - 1. Products:
 - a. Nisus Corporation; Bora-Care: www.nisuscorp.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Site Applied Termiticide and Mildewcide: Borate mineral salt based, spray applied termiticide, mildewcide and mold growth preventative.
 - 1. Products:
 - a. Nisus Corporation; Bora-Care: www.nisuscorp.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Site Applied Termiticide for Wood, Steel and Concrete: Borate mineral salt based, spray applied termiticide formulated for use on wood, steel, concrete and other building materials.
 - 1. Active Ingredient: 40% minimum disodium octaborate tetrahydrate (DOT).
 - 2. Carrier and Penetrant: Proprietary glycol solution.
 - 3. Products:
 - a. Nisus Corporation; Bora-Care: www.nisuscorp.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Site Applied Mold Cleaner: Non-bleaching, oxidizer based formula with high-pH tolerant surfactant. Contains no sodium hydroxide or sodium hypochlorite.
 - 1. Products:
 - a. Nisus Corporation; Bora-Care with Mold-Care: www.nisuscorp.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Surface-Applied Wood Preservative: Pressure treatment in accordance with AWWPA U1, using water borne preservative.
- G. Surface-Applied Fire-Retardant:
 - 1. Fire Retardant and Preservative Treatment: Dip- or brush-type, non-discoloring.
 - a. Number of Coats: Two.
 - b. Surface Burning Characteristics: Class A; Flame spread index of 25 or less, smoke developed index of 26 or less, when tested in accordance with ASTM E84.

- c. Recommended Reapplication Period: Five years.
- 2. Basis of Design Product: Fire-Kote 100 manufactured by Universal Fire-Shield; www.firechemicals.com.
- 3. Other Acceptable Manufacturers:
 - a. Flame Stop, Inc.; Flame Stop II: www.flamestop.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 PREPARATION

- A. Remove dust, dirt and other contaminants from treatment surfaces. Remove tarpaulins, dropcloths, strippable protective films, etc., from areas to be treated. Move equipment and stored materials that block or prevent product application.

3.02 INSTALLATION - GENERAL

- A. Provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 SITE APPLIED WOOD TREATMENT

- A. Comply with manufacturers written mixing and installation instructions.
- B. Termiticide: Apply to foundations, structure and other items as listed.
 - 1. All structural wood and sill plates within 24 inches, minimum, of point of contact with foundation.
 - 2. All wood, wood based and cellulosic sheathing within 24 inches, minimum, of point of contact with foundation.
 - 3. Concrete foundations 2 inches, minimum, from sill plate.
 - 4. All pipe and plumbing penetrations up to 24 inches, minimum, above slab and slab surface within 6 inches, minimum, of pipe or penetration.
 - 5. Concrete or masonry basement walls up to 24 inches, minimum, from top of soil.
 - 6. Six inches, minimum, on either side of control joints and construction joints in slabs and joints between slabs and abutting material.
- C. Mildewcide: Apply to wood and wood based building materials as listed.
 - 1. All structural wood and sill plates within 24 inches, minimum, of point of contact with foundation.
 - 2. All wood, wood based and cellulosic sheathing within 24 inches, minimum, of point of contact with foundation.
- D. Fire-Retardant:
 - 1. Apply fire-retardant and preservative treatment in accordance with manufacturer's instructions.
 - a. Verify materials do not exceed the specified percent moisture content before applying wood treatment.
 - b. Brush apply two coats of fire-retardant and preservative treatment.

2. Apply dip- or brush-type preservative to site-sawn ends of pressure preservative treated materials. Allow preservative to cure prior to erecting materials.
3. Do not install materials until site pre-finishing and back priming is complete and dry.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural dimension lumber framing.
- B. Nonstructural dimension lumber framing.
- C. Rough opening framing for doors, windows, and roof openings.
- D. Sheathing.
- E. Roofing nailers.
- F. Preservative treated wood materials.
- G. Communications and electrical room mounting boards.
- H. Concealed wood blocking, nailers, and supports.
- I. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 30 00 - Cast-in-Place Concrete: Setting anchors in concrete.
- C. Section 05 12 00 - Structural Steel Framing: Prefabricated beams and columns for support of wood framing.
- D. Section 05 50 00 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
- E. Section 06 17 33 - Wood I-Joists.
- F. Section 06 18 00 - Glued-Laminated Construction.
- G. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 1. Use 2016a as indicated in 2019 CBC Referenced Standards.
- B. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
- C. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 1. Use 2016 as indicated in 2019 CBC Referenced Standards.
- E. AWC NDS - National Design Specification® (NDS®) for Wood Construction.
- F. AWC SDPWS - Special Design Provisions for Wind and Seismic.
- G. AWPA U1 - Use Category System: User Specification for Treated Wood.

1. Use 2017 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- H. PS 1 - Structural Plywood.
- I. PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
- J. PS 20 - American Softwood Lumber Standard.
 1. Use 2005 as indicated in 2019 CBC Referenced Standards.
- K. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.
- C. Structural Composite Lumber: Submit manufacturer's published structural data including span tables, marked to indicate which sizes and grades are being used; if structural composite lumber is being substituted for dimension lumber or timbers, submit grading agency structural tables marked for comparison.
- D. Evaluation Service Reports: Show compliance with specified requirements.
- E. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Correct defective work within a two-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
 2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
 3. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Grading Agency: West Coast Lumber Inspection Bureau; WCLIB (GR).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19. Maximum 19%.
- D. Stud Framing (2 by 2 through 2 by 6):
 - 1. Species: Douglas Fir-Larch.
 - 2. Grade: No. 1 & Better.
- E. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
 - 1. Species: Douglas Fir-Larch.
 - 2. Grade: No. 1 and Better.
 - a. No. 1 & Better for joists and rafters;
 - b. No. 1 for beams and stringers.
- F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 1 or Construction Grade.
 - 2. Boards: No. 2 or Standard Grade.

2.03 STRUCTURAL COMPOSITE LUMBER

- A. At Contractor's option, structural composite lumber may be substituted for concealed dimension lumber and timbers.
- B. Structural Composite Lumber: Factory fabricated beams, headers, and columns, of sizes and types indicated on drawings; structural capacity as published by manufacturer and ESR Report.
 - 1. Columns: Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber with manufacturer's published E (modulus of elasticity): 2,000,000 psi, minimum.
 - 2. Beams: Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber with manufacturer's published E (modulus of elasticity): 2,000,000 psi, minimum.
 - 3. Headers Not Longer Than 48 inches: Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber.
 - 4. Manufacturers:
 - a. Boise Cascade Company: www.bc.com.
 - b. Georgia-Pacific Corp.: www.buildgp.com.
 - c. RedBuilt; RedLam LVL: www.redbuilt.com
 - d. Weyerhaeuser Company: www.weyerhaeuser.com/#sle.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 CONSTRUCTION PANELS

- A. Roof Sheathing: Any PS 1 type, rated Structural I Plywood Sheathing.
 - 1. Bond Classification: Exterior.
 - 2. Span Rating: 24.

3. Performance Category: 15/32 PERF CAT.
 4. Edge Profile: Square edge.
- B. Wall Sheathing: Any PS 2 type plywood.
1. Bond Classification: Exterior.
 2. Grade: Structural I Sheathing.
 3. Span Rating: 24.
 4. Performance Category: 15/32 PERF CAT.
 5. Edge Profile: Square edge.
- C. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
- D. Other Applications:
1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
 2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
 3. Other Locations: PS 1, C-D Plugged or better.

2.05 ACCESSORIES

- A. Fasteners and Anchors:
1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
 2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
 3. Anchors: As indicated on Drawings, see also Section 05 05 19.
- B. Sill Flashing: As specified in Section 07 62 00.
- C. Subfloor Adhesives: Waterproof, air cure type, cartridge dispensed; adhesives designed for subfloor applications and complying with either ASTM C557 or ASTM D3498.

2.06 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

PART 3 EXECUTION

3.01 PREPARATION

- A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches and seal.
- B. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FRAMING INSTALLATION

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength.
- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- C. Install structural members full length without splices unless otherwise specifically detailed.
- D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by AWC NDS, AWC SDPWS, and applicable codes.
- E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.
- F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.
- G. Provide bridging at joists in excess of 8 feet span as detailed. Fit solid blocking at ends of members.
- H. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.
 - 1. Comply with CBC Section 718.2 Fireblocking.
- C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
- D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- F. Provide the following specific nonstructural framing and blocking:
 - 1. Cabinets and shelf supports.

2. Wall brackets.
3. Handrails.
4. Grab bars.
5. Towel and bath accessories.
6. Wall-mounted door stops.
7. Chalkboards and marker boards.
8. Wall paneling and trim.
9. Joints of rigid wall coverings that occur between studs.

3.05 INSTALLATION OF CONSTRUCTION PANELS

- A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
 1. At long edges provide solid edge blocking where joints occur between roof framing members.
 2. Nail panels to framing; staples are not permitted.
- B. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails or screws.
 1. Use plywood or other acceptable structural panels at building corners, for not less than 96 inches, measured horizontally.
- C. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
 2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
 3. Install adjacent boards without gaps.
 4. Size and Location: As indicated on drawings.

3.06 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

3.07 TOLERANCES

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.08 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.

3.09 CLEANING

- A. Waste Disposal: See Section 01 74 19 - Construction Waste Management and Disposal.
 - 1. Comply with applicable regulations.
 - 2. Do not burn scrap on project site.
 - 3. Do not burn scraps that have been pressure treated.
 - 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 20 00
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Finish carpentry items.
- B. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- C. Section 06 41 00 - Architectural Wood Casework: Shop fabricated custom cabinet work.
- D. Section 06 41 00 - Architectural Wood Casework: Cabinet hardware.
- E. Section 09 91 23 - Interior Painting: Painting of finish carpentry items.

1.03 REFERENCE STANDARDS

- A. ANSI A135.4 - American National Standard for Basic Hardboard.
- B. ANSI A208.1 - American National Standard for Particleboard.
- C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards.
- D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1.
- E. AWPA U1 - Use Category System: User Specification for Treated Wood.
- F. BHMA A156.9 - American National Standard for Cabinet Hardware.
- G. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood.
- H. NEMA LD 3 - High-Pressure Decorative Laminates.
- I. PS 1 - Structural Plywood.
- J. WDMA I.S. 4 - Industry Specification for Preservative Treatment for Millwork.
- K. WI (MCP) - Monitored Compliance Program (MCP).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.
- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Provide manufacturer's product data, storage and handling instructions for factory-fabricated units.

2. Provide instructions for attachment hardware and finish hardware.
- C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
 2. Provide the information required by AWMAC/WI (NAAWS).
 3. Include certification program label.
- D. Samples: Submit two samples of finish plywood, 6 by 8 inch in size illustrating wood grain and specified finish.
- E. Samples: Submit two samples of wood trim 6 inch long.
- F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
 1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- B. Quality Certification:
 1. Comply with WI (MCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section www.woodworkinstitute.com/#sle.
 2. Provide labels or certificates indicating that the work complies with AWMAC/WI (NAAWS) requirements for grade or grades specified.
 3. Provide designated labels on shop drawings as required by certification program.
 4. Provide designated labels on installed products as required by certification program.
 5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.
- B. Protect from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

- A. Quality Standard: Custom Grade, in accordance with AWMAC/WI (NAAWS), unless noted otherwise.
- B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.
- C. Interior Woodwork Items:

1. Moldings, Bases, Casings, and Miscellaneous Trim: Any closed-grain hardwood; prepare for paint finish.
2. Loose Shelving: Birch plywood; prepare for paint finish.

2.02 LUMBER MATERIALS

- A. Softwood Lumber: Douglas Fir species, S4S sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
- B. Hardwood Lumber: Drawing indicated species, S4S sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.

2.03 SHEET MATERIALS

- A. Softwood Plywood, Not Exposed to View: Any face species, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.
- B. Softwood Plywood, Exposed to View: Face species as indicated, plain sawn, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.
- C. Hardwood Plywood: Face species as indicated, plain sawn, book matched, medium density fiberboard core; HPVA HP-1, Front Face Grade AA, Back Face Grade 1, glue type as recommended for application.
- D. Particleboard: ANSI A208.1; Composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.
- E. Hardboard: ANSI A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch thick, smooth one side (S1S).

2.04 PLASTIC LAMINATE MATERIALS

- A. Plastic Laminate: NEMA LD 3, HGS; color as selected by Architect; textured, low gloss finish.
- B. Laminate Backing Sheet: NEMA LD 3, BKL; undecorated plastic laminate.
- C. Laminate Adhesive: Type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

2.05 FASTENINGS

- A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.
- B. Fasteners: Of size and type to suit application; blind finish in concealed locations and Architect selected finish in exposed locations.
- C. Concealed Joint Fasteners: Threaded steel.

2.06 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Lumber for Shimming and Blocking: Softwood lumber of indicated species.
- C. Plastic Edge Trim: Extruded convex shaped; smooth finish; self locking serrated tongue; of width to match component thickness; color as selected.
- D. Aluminum Edge Trim: Extruded convex shape; smooth surface finish; self locking serrated tongue; of width to match component thickness; bronze anodized finish.

- E. Primer: Alkyd primer sealer.
- F. Wood Filler: Oil base, tinted to match surface finish color.

2.07 HARDWARE

- A. Hardware: Comply with BHMA A156.9.

2.08 WOOD TREATMENT

- A. Factory-Treated Lumber: Comply with requirements of AWPA U1 - Use Category System for pressure impregnated wood treatments determined by use categories, expected service conditions, and specific applications.
- B. Wood Preservative by Pressure Treatment (PT Type): Provide AWPA U1 treatment using waterborne preservative with 0.25 percent retainage.
- C. Water Repellent Preservative Treatment by Dipping Method: WDMA I.S. 4, with 0.25 percent retainage.
- D. Wood Preservative (Surface Application): Clear, Woodlife Classic type, Tris-2,4,6-(Dimethylaminomethyl) Phenol manufactured by Rust-Oleum Corporation.
- E. Shop pressure treat wood materials requiring preservatives to concealed wood blocking.
- F. Provide identification on fire retardant treated material.
- G. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.
- H. Redry wood after pressure treatment to maximum 19 percent moisture content.

2.09 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. Fit exposed sheet material edges with 3/8 inch matching hardwood edging. Use one piece for full length only.
- C. Cap exposed plastic laminate finish edges with plastic trim.
- D. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- E. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
- F. Apply laminate backing sheet to reverse face of plastic laminate finished surfaces.

2.10 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
- D. Finish work in accordance with AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 1. Transparent:
 - a. System - 12, Polyurethane, Water-based.

- b. Stain: As selected by Architect.
 - c. Sheen: Satin.
- 2. Opaque:
 - a. System - 4, Latex Acrylic, Water-based.
 - b. Color: As selected by Architect.
 - c. Sheen: Satin.
- E. Back prime woodwork items to be field finished, prior to installation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION

- A. Install work in accordance with AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Install factory-fabricated units in accordance with manufacturer's printed installation instructions.
- C. Set and secure materials and components in place, plumb and level.
- D. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
- E. Install components with nails at 12 inch on center.
- F. Install prefinished paneling with full bed contact adhesive applied to substrate.
- G. Install hardware in accordance with manufacturer's written instructions.

3.03 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment in accordance with manufacturer's instructions.
- B. Brush apply one coats of preservative treatment on wood in contact with cementitious materials. Treat site-sawn cuts.
- C. Allow preservative to dry prior to erecting members.

3.04 PREPARATION FOR SITE FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- B. Site Finishing: See Section 09 91 23.
- C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.05 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

SECTION 06 41 00
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Specially fabricated cabinet units. PL-1, PL-2
- B. Countertops.
- C. Hardware.
- D. Factory finishing.
- E. Preparation for installing utilities.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 06 20 00 - Finish Carpentry: Wood trim unrelated to casework.
- C. Section 09 21 16 - Gypsum Board Assemblies: Support framing, grounds, and concealed blocking.

1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1.
- C. BHMA A156.9 - American National Standard for Cabinet Hardware.
- D. NEMA LD 3 - High-Pressure Decorative Laminates.
- E. WI (CCP) - Certified Compliance Program (CCP).
- F. WI (MCP) - Monitored Compliance Program (MCP).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 - 1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
 - 2. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
 - 3. Include certification program label.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

- E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.
- F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- G. Maintenance Materials: Furnish the following for District's use in maintenance of project:
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Spare Parts: One of each kind of lock.
 - 3. Extra Stock Materials: six keys of each kind of lock.

1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
 - 1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
 - 2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
 - a. A Licensee of the Woodwork Institute's Certified Compliance Program.
 - 3. Single Source Responsibility: Provide and install this work from single fabricator.
- B. Quality Certification:
 - 1. Comply with WI (MCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section:
<https://woodworkinstitute.com/#sle>.
 - 2. Provide labels or certificates indicating that the installed work complies with AWMAC/WI (NAAWS) requirements for grade or grades specified.
 - 3. Provide designated labels on shop drawings as required by certification program.
 - 4. Provide designated labels on installed products as required by certification program.
 - a. Before delivery to the jobsite the woodwork supplier shall provide a Woodwork Institute Certified Compliance Certificate indicating the millwork products being supplied and Certifying that these products fully meet the requirements of the Grade or Grades specified.
 - b. Each elevation of casework, each laminated plastic top, and each solid surface top shall bear a Woodwork Institute Certified Compliance Label.
 - 5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
 - a. At completion of installation the woodwork installer shall provide a Woodwork Institute Certified Compliance Certificate indicating the products installed, and Certifying that the installation of these products fully meets the requirements of the Grade or Grades specified.
 - 6. All fees charged by the Woodwork Institute for their Certified Compliance program are the responsibility of the millwork manufacturer and/or installer and shall be included in the bid.
 - 7. Replace, repair, or rework all work for which certification is refused.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from moisture damage.

1.08 FIELD CONDITIONS

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Wall hung cabinets and floor supported cabinets over 5 feet high shall be braced and anchored in accordance with the California Building Code (CBC) Title 24 Part 2, Table 1607A.1.
 - 1. Comply with OHSPD Pre-Approval OPM-0092.
- B. Requirements for Persons with Disabilities: Provide products meeting requirements of California Code of Regulations (CCR), Title 24, Part 2, Chapter 11B and ADA Accessibility Guidelines for Buildings and Facilities, latest amendment.
 - 1. Operable parts for all accessible casework shall comply with CBC Section 11B-309 Operable Parts.
 - 2. Pull hardware shall be U-shaped wire pulls or equally accessible at all accessible casework; CBC 11B-811.4 Operable Parts.

2.02 CABINETS

- A. Quality Standard: Custom Grade, in accordance with AWMAC/WI (NAAWS), unless noted otherwise.
- B. Plastic Laminate Faced Cabinets: Custom grade.
- C. Cabinets:
 - 1. Finish - Exposed Exterior Surfaces: Decorative laminate.
 - 2. Finish - Exposed Interior Surfaces: Decorative laminate.
 - 3. Finish - Semi-Exposed Surfaces: Cabinet Liner.
 - a. Cabinet interiors (other than exposed interior surfaces of open or glass front cabinets) including faces of shelving therein, and interior door faces.
 - 4. Finish - Concealed Surfaces: Manufacturer's option.
 - 5. Door and Drawer Front Edge Profiles: Square edge with thick applied band.
 - a. Provide with subfronts and applied finish fronts securely fastened, with square corners, edges finished with 3 mm purified PVC.
 - b. Doors, Drawer Fronts, and False Fronts: 3 mm purified PVC edge band, color and pattern to match exposed laminate, hot-melt applied.
 - c. All other exposed and semi exposed edges: 1 mm PVC edge band, color and pattern to match exposed laminate.
 - 6. Door and Drawer Front Retention Profiles: Fixed panel.
 - 7. Casework Construction Type: Type A - Frameless.

8. Interface Style for Cabinet and Door: Style 1 - Overlay; reveal overlay.
 - a. Hinged to swing flat against the face of adjoining cabinet or the side of cabinet
 - b. Do not notch door or cabinet ends, or divisions to receive hinge.
9. Patterned Face Layout for Cabinet and Door Fronts: Flush panel.
 - a. Custom Grade: Doors, drawer fronts and false fronts wood grain to run and match vertically within each cabinet unit.
10. Cabinet Design Series: As indicated on drawings.
 - a. Base Cabinets without drawers: 100 series.
 - b. Base Cabinets with drawers: 200 series.
 - c. Wall hung Cabinets: 300 series.
 - d. Tall Storage Cabinets: 400 series.
 - e. Wardrobe Cabinets: 500 series.
 - f. Library Cabinets: 600 series.
11. Adjustable Shelf Loading: 50 lbs. per sq. ft.
 - a. Deflection: L/144.
 - b. Shelves: 1-M-2 particle board, 1 inch thick, MOE of 950.
 - c. Edge Bands: 1 mm PVC in color to match shelf. All 4 edges of adjustable shelves to receive banding.
12. Cabinet Style: Flush overlay.
13. Cabinet Doors and Drawer Fronts: Flush style.
14. Drawer Side Construction: Multiple-dovetailed.
15. Drawer Construction Technique: As recommended by fabricator.

2.03 WOOD-BASED COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.
- B. Lumber shall be sound, kiln dried softwood and/or hardwood meeting the requirements of the NAAWS Grade specified for its intended purpose.
- C. Panels shall contain no added urea-formaldehyde resins and shall be in accordance with the NAAWS requirements for the grade specified.
 1. Veneer: HPVA grade to meet the NAAWS requirements for type of surface and grade.
 2. Core: Comply with NAAWS.
 - a. Basis of Design Material: Combination Core, PureBond Classic Core, www.columbiaforestproducts.com, or approved equal.

2.04 LAMINATE MATERIALS

- A. Manufacturers:
 1. Arborite: www.arborite.com/#sle.
 2. Abet - Laminati: www.abetlaminati.com
 3. Formica Corporation: www.formica.com/#sle.
 4. Lamin-Art: www.laminart.com.

5. Panolam Industries International, Inc: www.panolam.com/#sle.
 6. Wilsonart LLC: www.wilsonart.com/#sle.
 7. Substitutions: See Section 01 60 00 - Product Requirements.
- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
- C. Flame Spread Rating ASTM E84: Provide units bearing the label of Underwriters' Laboratories, or other testing agency acceptable to the State Fire Marshal, indicating that the units provide the specified flame spread rating.
1. Class B Flame spread rating 26-75, smoke developed 0-450 per ASTM E84 for each acoustical tile type.
- D. Provide specific types as indicated.
1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, color as selected, finish as selected.
 2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, color as selected, finish as selected.
 3. Post-Formed Horizontal Surfaces: HGP, 0.039 inch nominal thickness, color as selected, finish as selected.
 4. Post-Formed Vertical Surfaces: VGP, 0.028 inch nominal thickness, color as selected, finish as selected.
 5. Cabinet Liner: CLS, 0.020 inch nominal thickness, color as selected, finish as indicated.
 6. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.05 DESIGN RESIN MATERIAL

2.06 COUNTERTOPS

- A. Plastic Laminate Countertops: Medium density fiberboard substrate covered with HPDL, conventionally fabricated and self-edge banded. Details as indicated on Drawings

2.07 ACCESSORIES

- A. Adhesive: Type recommended by NAAWS to suit application.
1. Urea Formaldehyde adhesives shall not be used.
 2. Contact cement shall have a VOC content of less than 80 g/l.
 3. Construction adhesive shall have a VOC content compliant with Section 01 61 16.
- B. Plastic Edge Banding: Extruded PVC, convex shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
1. Color: As selected by Architect from manufacturer's standard range.
 2. Use at all exposed plywood edges.
 3. Use at all exposed shelf edges.
- C. Fasteners: Size and type to suit application.

- D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- E. Concealed Joint Fasteners: Threaded steel.
- F. Grommets: Standard plastic, painted metal, stainless steel, or chrome plated grommets for cut-outs, in color to match adjacent surface.
 - 1. Basis of Design Product: TG Flip-Top® Series as manufactured by Doug Mocket & Company, Inc., or approved equal.
 - a. Application: desk, countertop, or worksurface grommets.
 - b. Hole Diameter: 3 inches.
 - c. Type: Flip Top.
 - d. Color as selected by Architect.
 - e. Location as directed by Architect or District. Final location and color to be indicated on shop drawing submittal.
- G. Air Vent:
 - 1. Basis of Design Product: GTMesh1/4x8 - GT Grille Mesh1 as manufactured by Doug Mocket & Company, Inc., or approved equal.
 - a. Application: Equipment or other cabinet venting.
 - b. Size: 4 x 8 inches.
 - c. Type: Painted Metal.
 - d. Color as selected by Architect.
 - e. Location: 2 inches above bottom shelf and 2 inches below drawer (if provided).
 - 1) Final location to be verified on shop drawing submittal.

2.08 HARDWARE

- A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
- B. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch spacing adjustments.
 - 1. Locking 3/4-inch plastic shelf supports for 5mm hole diameter.: Knap & Vogt Manufacturing Company; Product No. 339: www.knapandvogt.com.
- C. Drawer and Door Pulls: "U" shaped wire pull, steel with chrome finish, 4 inch centers.
 - 1. Comply with CBC 11B-811.4.
 - 2. Amerock: BP76312-G10, 4 inch Pull, Allison Value Hardware
 - 3. Rockler: Satin Nickel 4 inch Wire Pull.
 - 4. Top Knob: M338 - Wire Pull 4 inch - Brushed Satin Nickel - Somerset Collection
 - 5. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Sliding Markerboard Pulls: Elongated shape for recessed installation, aluminum with satin finish.
 - 1. Comply with CBC 11B-811.4.
 - 2. Knap & Vogt; Product No. 813, Steel Knob Pull: www.knapandvogt.com.

3. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish.
1. Provide locks on all cabinet doors and drawers in classrooms, except accessible sink bases, and as follows:
 - a. A.V. Cabinets.
 - b. Tall Storage Cabinets.
 - c. Display Cabinets.
 - d. Wardrobe.
 - e. Work Area.
 - f. "Personal" Drawers.
 - g. Filing Cabinets.
 - h. Workrooms to have locks on all doors and drawers.
 2. Locks for doors and drawers shall be keyed alike for each room and master keyed.
 3. Metal Strike Plates: Provide cabinet door and drawer locks with metal strike plates to protect against particle board rip out.
 4. Door and drawer locks shall be of pin tumbler design and include working cylinder slides and forwardly removable cylinder to re-key without totally disassembling lock body and passed by ANSI Grade 1 testing.
 5. Locks shall be easily rekeyable pin tumbler with working top slide and retainer staple.
 6. Cabinet Locks:
 - a. Olympus Lock; Product 500DR: www.olympus-lock.com.
 - b. Corbin Cabinet Lock; Product 0737 Drawer Lock: www.cclsecurity.com.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
 7. Drawer Locks:
 - a. Olympus Lock; Product 600DW: www.olympus-lock.com.
 - b. Corbin Cabinet Lock; Product 0738 Drawer Lock: www.cclsecurity.com.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Catches: Magnetic.
1. Catches for Doors Without Locks: Magnetic with aluminum case.
 - a. Amerock; Product No. 145: www.amerock.com.
 - b. The Engineered Products Co.; Product EP591: www.epcohardwaresecurity.com.
 - c. Stanley Architectural Hardware; Product CD46.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
 2. Catches for Inactive Leaf of Pairs of Doors With Locks: Elbow catch.
 - a. Amerock; Product E.Z. Flex No. 3675-2G: www.amerock.com.
 - b. The Engineered Products Co.; Product No. 1016: www.epcohardwaresecurity.com.
 - c. Ives; Product 2-A92: www.iveshinges.com.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Drawer Slides:
1. Type: Full extension, no deflection.

2. Static Load Capacity: As required by drawer size.
 - a. For drawers up to 18 inches wide and less than 4 inches in depth, provide slides with 100 pound capacity.
 - b. For drawers over 18 inches in width and over 4 inches in depth, provide slides with 150 pound capacity.
 - 1) Drawer slide capacity with paper storage: 200 pounds.
3. Mounting: Side mounted.
4. Stops: Positive type.
5. Features: Provide self closing/stay closed type.
6. Manufacturers:
 - a. Accuride International, Inc; Light-Duty Drawer Slides: www accuride.com/#sle.
 - b. Accuride International, Inc; Heavy-Duty Drawer Slides: www accuride.com/#sle.
 - c. Grant Hardware Company, Division of Hettich International: www.hettichamerica.com.
 - d. Hettich America, LP: www.hettich.com/#sle.
 - e. Knap & Vogt Manufacturing Company; Light-Duty Drawer Slides: www.knapeandvogt.com/#sle.
 - f. Knap & Vogt Manufacturing Company; Medium-Duty Drawer Slides: www.knapeandvogt.com/#sle.
 - g. Knap & Vogt Manufacturing Company; Heavy-Duty Drawer Slides: www.knapeandvogt.com/#sle.
 - h. Substitutions: See Section 01 60 00 - Product Requirements.
- H. File Drawer Slides and accessories:
 1. Type: Full extension.
 2. Static Load Capacity: Extra Heavy Duty grade.
 - a. Provide 150 pound capacity.
 - b. Lateral file drawers more than 24 inches wide: 200 pound capacity
 3. Mounting: Side mounted.
 4. Stops: Positive type. 3-section slide, 1/2 inch slide space.
 5. File Drawer Track and Follower: K&V 476T ZC and K&V 476F ZC or equal.
 6. Features: Provide self closing/stay closed type with rolling balls, steel rollers and self-lubricating bearings.
 7. Manufacturers:
 - a. Accuride International, Inc: www accuride.com.
 - b. Grant Hardware Company Division of Hettich International: www.hettichamerica.com.
 - c. Knap & Vogt Manufacturing Company: www.knapeandvogt.com.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- I. Hinges: Butt self-closing type, BHMA No. A156.9 level, Grade 1, steel with polished finish.
 1. Manufacturers:

- a. Blum, Inc; COMPACT BLUMOTION: www.blum.com/#sle.
 - b. Grass America Inc: www.grassusa.com/#sle.
 - c. Hafele America Co.; : www.hafele.com.
 - d. Hardware Resources: www.hardwareresources.com/#sle.
 - e. Hettich America, LP: www.hettich.com/#sle.
 - f. Stanley Hardware Div.: www.stanleycommercialhardware.com.
 - g. Substitutions: See Section 01 60 00 - Product Requirements.
- J. Hinges: Pivot (knife) self-closing type, steel with satin finish.
- 1. Minimum door width: 1 inch.
 - 2. Manufacturers:
 - a. Basis of Design: Spring Pivot, 7100 Series Adjustable Spring Tension, 7112 Surface as manufactured by Bommer Industries, Inc., or equal.
 - b. Hafele America Co.; : www.hafele.com.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
- K. Cabinet Pocket Door Slides:
- 1. Bracket: Surface-mounted.
 - 2. Slide: Manufacturer's standard steel ball-bearings.
 - 3. Finish: Manufacturers standard, factory-applied black coating.
 - 4. Manufacturers:
 - a. Accuride International, Inc; 1321 Pro-Pocket Light-Duty Slides: www accuride.com/#sle.
 - b. Knap & Vogt Manufacturing Company; 8070 Series Pocket Door Slides: www.knapeandvogt.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
- L. Television and Monitor Support Slides:
- 1. Manufacturers:
 - a. Accuride International, Inc; CB3620-258TV: www accuride.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.09 SITE FINISHING MATERIALS

- A. Stain, Shellac, Varnish, and Finishing Materials: In compliance with AWMAC/WI (NAAWS), unless noted otherwise.

2.10 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

- D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
 - 1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
 - 2. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- E. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

2.11 SHOP FINISHING

- A. Finish work in accordance with AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 1. Transparent:
 - a. System - 12, Polyurethane, Water-based.
 - b. Stain: As selected by Architect.
 - c. Sheen: Flat.
 - 2. Opaque:
 - a. System - 4, Latex Acrylic, Water-based.
 - b. Color: As selected by Architect.
 - c. Sheen: Flat.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

- A. Install work in accordance with AWMAC/WI (NAAWS) requirements for grade indicated.
 - 1. Install in accordance and comply with WI Certified Seismic Installation Program (CSIP).
 - a. Certified Seismic Casework Installation:
 - 1) All wood or metal frame wall construction shall be constructed with continuous in wall blocking of either 3x6 flat Douglas Fir, 16 ga. x 6 inch wide, or as indicated on the AHJ approved structural drawings, 50 KSI sheet metal provided in accordance with the location requirements included on the cabinet fabricator/installer's shop drawings. Responsibility for blocking installation shall be that of the wall fabricator.
 - 2) All casework installation shall be certified by the Woodwork Institute in accordance with their Certified Seismic Installation Program (CSIP), including:
 - (a) A CSIP Certificate indicating that all of the casework installation fully meets the requirements of the NAAWS and CSIP.
 - 3) It is the responsibility of the installer to include within their bid, any and all costs for WI's CSIP certification. Certification is a prerequisite for final acceptance. For further information, please visit www.woodworkinstitute.com
 - 2. Provide a WI Certified Compliance Certificate for installation as specified herein.

- B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
 - 1. Install plumb, level, true and straight with no distortions. Shim as required using concealed shims. Scribe and cut for accurate fit.
 - 2. Base Cabinets: Set cabinets straight, plumb, and level. Adjust sub-tops within 1/16 inch of a single plane. Fasten each individual cabinet to floor at toe space, with fasteners spaced 12 inches on center. Bolt continuous cabinets together. Secure individual cabinets with not less than 2 fasteners into floor, where they do not adjoin other cabinets.
 - a. Where required, assemble units into one integral unit with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch.
 - 3. Wall Cabinets: Securely fasten woodwork per Division of the State Architect Standards (as adopted by WI) to solid supporting wall framing material, not plaster, lath, or gypsum board. Anchor, adjust, and align wall cabinets as specified for base cabinets.
 - a. Reinforcement of stud walls to support wall-mounted cabinets specified in appropriate section, but responsibility for accurate location and sizing of reinforcement shall be coordinated with applicable trade.
- C. Use fixture attachments in concealed locations for wall mounted components.
- D. Use concealed joint fasteners to align and secure adjoining cabinet units.
 - 1. Install without distortion so that doors and drawers fit openings and are accurately aligned.
- E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- F. Secure cabinets to floor using appropriate angles and anchorages.
- G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- H. Install finish hardware after all finish work has been completed. Inspect drilling operations for surface splinters or delaminations. Pieces bearing such imperfections will be rejected.

3.03 ADJUSTING

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 06 83 16
FIBERGLASS REINFORCED PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Glass fiber reinforced plastic panels, FRP-1.
- B. Trim.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

- A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
- B. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of Barcol Impressor.
- C. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
- D. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- F. FDA Food Code - Chapter 6 - Physical Facilities.
- G. ISO 846 - Plastics - Evaluation of the action of microorganisms.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design Product: Panolam FRP as manufactured by Panolam Industries International, Inc., or approved equal.
- B. Fiberglass Reinforced Plastic Panels:

1. Crane Composites, Inc: www.cranecomposites.com.
2. Marlite: Standard FRP: www.marlite.com.
3. Nudo: www.nudo.com.
4. Panolam Industries International, Inc; Panolam FRP: www.panolam.com/#sle.
5. Parkland Performance; Plas-Tex PolyWall; www.parklandplastics.com.
6. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PANEL SYSTEMS

A. Wall Panels:

1. Panel Size: 4 by 8 feet.
2. Panel Thickness: 0.075 inch.
3. Surface Design: Smooth.
4. Color: White.
5. Attachment Method: Adhesive only, with trim and sealant in joints.

2.03 MATERIALS

A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.

1. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Scratch Resistance: Barcol hardness score greater than 35, when tested in accordance with ASTM D2583.
4. Impact Strength: Greater than 6 ft lb force per inch, when tested in accordance with ASTM D256.
5. Surface Characteristics and Cleanability: Provide products that are smooth, durable, and easily cleanable, in compliance with FDA Food Code, Chapter 6 - Physical Facilities.
6. Biological Resistance: Rating of 0, when tested in accordance with ISO 846.

B. Trim: Aluminum; color coordinating with panel.

C. Adhesive: Type recommended by panel manufacturer.

D. Sealant: Type recommended by panel manufacturer; white.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions and substrate flatness before starting work.
- B. Verify that substrate conditions are ready to receive the work of this section.

3.02 INSTALLATION - WALLS

- A. Install panels in accordance with manufacturer's instructions.
- B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.

- C. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.
- D. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.
- E. Install panels with manufacturer's recommended gap for panel field and corner joints.
- F. Place trim on panel before fastening edges, as required.
- G. Fill channels in trim with sealant before attaching to panel.
- H. Install trim with adhesive and screws or nails, as required.
- I. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.
- J. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION

SECTION 07 01 50.20
ROOFING, RESTORATION, PATCH, AND REPAIR

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Patching and repair of existing adhered- and mechanically-attached, single-ply membrane roofing system, including insulation, roof board, flashings and other components, to restore roofing after the following:
 - 1. Repair of damaged and deteriorated areas, if found.
- B. Patching and repair shall not void or reduce Contractor's and manufacturer's warranty of existing roofing. Removal of existing roofing and repair is to be done by the Roofing Contractor in which the roofing system was originally installed.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood framing, plywood sheathing, wood curbs, cants, nailers, blocking and backing.
- B. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings, reglets,.

1.03 REFERENCE STANDARDS

- A. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board.
- B. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings.
- C. UL (DIR) - Online Certifications Directory.
- D. NRCA ML104 - The NRCA Roofing and Waterproofing Manual.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with affected mechanical and electrical work associated with roof penetrations.
- B. Preinstallation Meeting: Convene two weeks before starting work of this section.
 - 1. Attendance is mandatory at conference required in section specifying new roofing installation.
 - a. Require attendance by Contractor's superintendent and other supervisory and quality control personnel having responsibility for roofing, supervisory personnel of roofing installer and, if required for warranty provisions, representative of roofing products manufacturer.
 - b. Construction Manager, testing and inspection agency (if engaged by District), District's insurance underwriter (if necessary, at District's option), and Architect (if authorized by District) will attend.
 - c. At Contractor's option, installers of each component of related Work, including deck or substrate construction, rooftop equipment, penetrations of roof deck, and other Work integral with or adjacent to roofing may attend.
 - d. If required, attendance shall include Authority Having Jurisdiction (AHJ). Contractor shall verify requirement with Authority Having Jurisdiction (AHJ) and arrange for attendance.

2. Establish at pre-bid job walk, number of layers to be removed and reconfirm at pre-installation conference.
3. See new roofing installation section for additional information.
4. Agenda items specific to patch and repair.
 - a. Review Drawings and Specifications for suitability for application of roofing system. Review application procedures and coordination required with related Work.
 - 1) Discuss changes and deviations from Drawings and Specifications, if any, recommended or required.
 - b. Walk roof areas to review and discuss substrate preparation including repair of unacceptable surfaces, roof drainage, penetrations, equipment curbs, and work performed by other trades which requires coordination with roofing system.
 - c. Review Contract Document requirements and submittals for roofing system, including roofing schedule, inspection and testing, and environmental conditions.
 - 1) Identify which governing regulations or insurance requirements will affect roofing system installation.
 - d. Discuss anticipated weather, as well as procedures for responding to unacceptable weather, including using temporary roofing.
 - 1) Temporary roofing, if necessary, will be added to scope of the Work by contract modification (change order or construction change directive), with acceptable adjustment in Contract Time and Contract Sum.
 - e. Document discussions in writing, including actions required, and distribute copy of report to each meeting participant.
 - f. Attendance by Construction Manager, Architect and independent testing and inspection agency shall not relieve Contractor of sole responsibility for means, methods, techniques and sequence of construction, in accordance with provisions of the Bidding and Contract Requirements.
- C. Schedule work to coincide with commencement of installation of new roofing system.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit for each type of material.
- C. Shop Drawings: Indicate size, configuration, and installation details.
- D. Preconstruction Test Reports.
- E. Materials Removal Company Qualification Statement.
- F. Installer's Qualification Statement.

1.06 QUALITY ASSURANCE

- A. Comply with Title 24 Part 2 - California Building Code Sections 1504 Performance Requirements, 1505 Fire Classification and 1507 Requirements for Roof Coverings; and Part 6 - California Energy Code requirements
- B. Materials Removal Firm Qualifications: Company specializing in performing the work of this section with minimum five years of documented experience.
- C. Industry Standards:

1. Work specified in this Section shall comply to manufacturer's product data and application instructions.
 2. Work shall also conform to recommended practices and details published in NRCA Roofing and Waterproofing Manual, NRCA ML104 and recommended practices and details of Western States Roofing Contractors Association (WSRCA), where such practices and details are more stringent.
- D. Testing and Inspection:
1. At District's option, services of an independent inspection and testing agency may be obtained. Costs of this service will be paid for by District.
 2. Contractor shall cooperate with independent testing and inspection agency.

1.07 SCHEDULING

- A. Remove only existing roofing materials that can be replaced with new materials as the weather will permit.

1.08 FIELD CONDITIONS

- A. Do not remove existing roofing membrane when weather conditions threaten the integrity of the building contents or intended continued occupancy.
- B. Maintain continuous temporary protection prior to and during installation of new roofing system.

1.09 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces affected by reroofing, by methods and with materials acceptable to warrantor.
1. Notify warrantor of existing roofing system before proceeding, and upon completion of reroofing.
 2. Obtain documentation verifying that existing roofing system has been inspected by warrantor and warranty remains in effect. Submit documentation at Project closeout.

PART 2 PRODUCTS

2.01 SYSTEM DESCRIPTION

- A. Roofing Assembly Requirements:
1. External Fire Exposure Classification: ASTM E108 Class A, UL (DIR) or Warnock Hersey listed.
- B. Indicated Roof Areas: Patch and repair existing roofing, perimeter flashings, base flashings, counter flashings, vent stack flashings, roofing membrane, and insulation where required for the installation of new roof mounted equipment.
- C. Patch and repair roofing as necessary to provide complete, weathertight installation conforming to referenced industry standards and as necessary to accommodate new Work.
- D. Contract Drawings and Specifications:
1. Contract Drawings and Specifications are diagrammatic and of a general nature only.

2. Materials manufacturer's specifications for roofing and related flashings shall govern Work as if set forth herein, except as specifically indicated or where more stringent requirements are specified or required by Authority Having Jurisdiction (AHJ).
 3. All Work shall be completed as required to obtain specified warranty and guarantee.
- E. Design Review:
1. Contractor, roofing installer and manufacturer's representative of the original roofing installation (if known or identifiable) shall review Drawings and Specifications.
 2. Obtain confirmation from roofing installer and manufacturer of original roofing (if known or identifiable) that selected roofing materials for patching and repair are proper, compatible and adequate for the Project and that conditions and details indicated and specified do not conflict with requirements and recommendations of manufacturer.

2.02 MATERIALS

- A. Temporary Protection: Sheet polyethylene; provide weights to retain sheeting in position.
 1. Provide thickness sufficient to prevent tearing or damage during use.
- B. Protection Board: ASTM C208 cellulose fiber board, one face finished with mineral fiber, asphalt and kraft paper.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing site conditions.
- B. Verify that existing roof surface is clear and ready for work of this section.
 1. Verify that roof deck is structurally sound to support live and dead load requirements of roofing system and sufficiently rigid to support construction traffic.

3.02 PREPARATION

- A. Coordination: Coordinate patching and repairs of roofing with installation of penetrations, supports and other adjoining new construction which affects existing roofing.
- B. Deck Preparation:
 1. Clean and prepare roof deck in accordance with roofing system manufacturer's instructions and recommendations.
 2. Correct substrate surfaces which are unacceptable to installer.
- C. Sweep roof surface clean of loose matter.
- D. Remove loose refuse and dispose off site.
 1. Free Fall Maximum: 8 feet, provide enclosed chutes for higher fall.
 2. Do not use District's disposal system.
- E. Deck Condition: Firm, smooth, clean and sufficiently dry to suit roofing manufacturer's requirements.
 1. Conduct moisture test of deck and surrounding roofing.
 2. Do not proceed with roofing application until deck and surrounding materials are dry.

3.03 MATERIAL REMOVAL

- A. Remove only existing roofing materials that can be replaced with new materials as the weather will permit.
- B. Remove metal counter flashings.
- C. Remove damaged portions of roofing membrane, perimeter base flashings, flashings around roof protrusions, pitch pans and pockets.
- D. Cut and lay flat any membrane blisters.
- E. Remove damaged insulation and fasteners, cant strips, blocking .
- F. Remove sheathing paper and underlay..
- G. Repair existing underlying deck surface to provide smooth working surface for new roof system.

3.04 TEMPORARY PROTECTION

- A. Provide temporary protective sheeting over uncovered deck surfaces.
- B. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights.
- C. Provide for surface drainage from sheeting to existing drainage facilities.
- D. Do not permit traffic over unprotected or repaired deck surface.

3.05 PATCHING AND REPAIRS

- A. General:
 - 1. It is intended to leave existing roofing intact as much as feasible.
 - a. Roofing Work is intended to be patching and repair of portions of existing roofing due to new:
 - 1) Structural supports.
 - 2) Penetrations.
 - 3) Heating, ventilating and air conditioning (HVAC) equipment.
 - 4) Electrical system penetrations.
 - b. Include repairs of areas damaged as result of construction activities.
 - 2. Comply with instructions and recommendations of manufacturer of existing roofing system for making patches and repairs.
 - 3. Comply also with recommended practices of referenced industry standards.
 - 4. Protect other Work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace and restore other construction damaged or degraded by roofing Work.
 - 5. Apply roofing materials in accordance with NRCA Roofing and Waterproofing Manual and published details and recommendations of Western States Roofing Contractors Association (WSRCA).
 - 6. Keep roofing materials dry before and during application. Do not permit phased construction.
- B. Flashing Replacement: Entire sheet of flashing membrane is to be adhered to vertical substrate and hot-air welded to the secured field membrane.

- C. Penetrations:
 - 1. Coordinate roofing Work with plumbing, mechanical and electrical Work and other Work involving penetrations of roofing membrane.
 - 2. Provide pipe and conduit penetrations as indicated on Drawings, or if more stringent, as detailed in NRCA - Roofing and Waterproofing Manual.
 - 3. Verify that penetrations through roof are adequately separated by a minimum of 18 inches from each other, away from curbs, platforms, sleepers and walls and are also located a minimum of 24 inches beyond all waterways.
- D. Other Roofing Accessories: Install other accessories in accordance with manufacturer's instructions and recommendations, and NRCA Construction Details, as applicable.
- E. Crickets and Tapered Areas: Install to provide positive slope at proper transitions at changes in roof plane.
- F. Flashing and Sheet Metal Work: Set and flash in integrated sheet metal.

3.06 FIELD QUALITY CONTROL

- A. Independent agency inspection and testing will be provided under provisions of Section 01 40 00.
- B. The drawings identify the approximate limits to material removal.
- C. Testing will identify the condition of existing materials and their reuse, repair or removal.
- D. Test Reports: Indicate existing insulation moisture content and existing roof system quality.

3.07 PROTECTION

- A. Provide temporary protective sheeting over uncovered deck surfaces.
- B. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights.
- C. Provide for surface drainage from sheeting to existing drainage facilities.
- D. Do not permit traffic over unprotected or repaired deck surface.

3.08 SCHEDULES

- A. Roof Areas as Indicated: Remove, where required, existing perimeter flashings, base flashings, counter flashings, vent stack flashings, roofing membrane, and insulation.
- B. Remove indicated roof mounted mechanical equipment and electrical equipment.

END OF SECTION

SECTION 07 21 00
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Batt insulation and vapor retarder in exterior wall, ceiling, and roof construction.
- B. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS

- A. Section 07 25 00 - Weather Barriers: Separate air barrier and vapor retarder materials.
- B. Section 09 24 00 - Cement Plastering: (CI) Continuous insulation at plaster applications.

1.03 REFERENCE STANDARDS

- A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
- C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - 1. Use 2015 as indicated in 2019 CBC Referenced Standards.
- D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
- E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- F. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
 - 1. Use 2016 as indicated in 2019 CBC Referenced Standards.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 1. Use 2016 as indicated in 2019 CBC Referenced Standards.
- H. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C.
 - 1. Use 2016 as indicated in 2019 CBC Referenced Standards.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
 - 1. Manufacturer and product identification for each product specified, including R-Value and fire resistance and surface burning characteristics specified herein.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Compliance Certification: Upon completion of installation of building envelope insulation, a card certifying compliance with requirements of California Code of Regulations (CCR) Title 24

for installation of insulation shall be completed, executed and delivered to local building officials, and one copy conspicuously posted at Project site.

- E. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

1.05 FIELD CONDITIONS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Fire Performance Characteristics: Where insulation is used within a fire rated wall assembly, provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, in accordance with methods specified below, by UL or other testing and inspecting agency acceptable to State Fire Marshal.
 - 1. Surface Burning Characteristics: ASTM E84.
 - a. Class A: Maximum flame-spread 0-25 and smoke developed of 0-450.
 - b. Class B: Maximum flame-spread 26-75 and smoke developed of 0-450.
 - c. Class C: Maximum flame-spread 76-200 and smoke developed of 0-450.
 - 2. Fire Resistance Ratings: ASTM E119.
 - 3. Combustibility: ASTM E136.
- B. Comply with Chapter 12-13 Standards for Insulating Materials, California Reference Standards Code (Part 12, Title 24. CCR) as published by Department of Consumer Affairs, Bureau of Home Furnishings and Thermal Insulation.
- C. Comply with California Energy Code:
 - 1. Section 110.8(a): Installed insulating material shall have been certified by the manufacturer to comply with the California Code of Regulations, Title 24, Part 12, Chapters 12-13, Article 3, "Standards for Insulating Material.
 - 2. Section 110.8(c): All Insulating Materials shall be installed in compliance with the flame spread rating and smoke density requirements of CBC Chapters 7 and 26.
 - 3. Section 120.7(b) item 7: The opaque portions of framed demising walls in nonresidential buildings shall be insulated to meet a u-factor of:
 - a. Metal Framed Walls: Not greater than 0.151 (R-6 minimum).
- D. Certificate: As required by the California Building Code (CBC), Title 24, post a certificate containing the building permit number and the insulation manufacturer's name, material identification and R-value and stating that the insulation has been installed in accordance with the plans and specifications.
- E. Performance: Materials shall conform to Section 720, California Building Code.

2.02 APPLICATIONS

- A. Insulation on Inside of Concrete and Masonry Exterior Walls: Glass fiber board.

- B. Insulation in Metal Framed Walls: Batt insulation with integral vapor retarder.
- C. Insulation in Wood Framed Walls: Batt insulation with no vapor retarder.
- D. Insulation Over Roof Deck: Polyisocyanurate board.

2.03 FOAM BOARD INSULATION MATERIALS

- A. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578 with either natural skin or cut cell surfaces.
 - 1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
 - 2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
 - 3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
 - 4. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88) per 1 inch thickness at 75 degrees F mean temperature.
 - 5. Board Edges: Manufacturer's standard.
 - 6. Type and Water Absorption: Type IV, 0.3 percent by volume, maximum, by total immersion.
 - 7. Continuous Insulation at Plaster Systems: See Section 09 24 00 - Cement Plastering.
 - 8. Products:
 - a. Dow Chemical Company; STYROFOAM CladMate, CavityMate Ultra, or Foamular: www.dowbuildingsolutions.com/#sle.
 - b. Kingspan Insulation LLC; GreenGuard XPS Type IV, 25 psi: www.kingspan.com/#sle.
 - c. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 FIBERBOARD INSULATION MATERIALS

- A. Mineral Fiberboard Insulation: Rigid mineral fiber, in accordance with ASTM C612.
 - 1. Facing: None, unfaced.
 - 2. Flame Spread Index: 25 or less, when tested with facing, if any, in accordance with ASTM E84.
 - 3. Smoke Developed Index: 50 or less, when tested with facing, if any, in accordance with ASTM E84.
 - 4. Board Size: 48 by 48 inch.
 - 5. Board Thickness: 1-1/2 inches.
 - 6. Board Edges: Square.
 - 7. Thermal Conductivity (k-factor): BTU inch/hr sq ft degrees F of 0.26 per inch at 75 degrees F when tested in accordance with ASTM C518.
 - 8. Maximum Density: 8 pounds per cubic foot, nominal.
 - 9. Products:
 - a. CertainTeed Corporation: www.certainteed.com/#sle.
 - b. Johns Manville: www.jm.com/#sle.

- c. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Mineral Fiberboard Insulation: Rigid or semi-rigid mineral fiber, ASTM C612 or ASTM C553; un-faced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
- 1. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
- C. Black faced, Flexible Glass-Fiber Board Insulation: ASTM C612, Type IA; ASTM C553, Types I, II, and III; or ASTM C665, Type I.
- 1. Where indicated, provide non-woven fiberglass facing on one side; with flame spread index of 25 or less, and smoke developed of 50 or less, when tested in accordance with ASTM E84.
 - 2. Nominal density of not less than 1.5 lb/cu. ft. or more than 1.7 lb/cu. ft. , thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F .
 - 3. Thickness: 2 inches.
 - 4. Manufacturers:
 - a. CertainTeed Corporation; CertaPro AcoustaBoard Black: www.certainteed.com/#sle.
 - b. Johns Manville; Insul-SHIELD Black Faced Board: www.jm.com/#sle.
 - c. Knauf Insulation; Black Acoustical Board with ECOSE Technology: www.knauf.com.
 - d. Owens Corning Corporation; SelectSound Black Acoustic Board: www.ocbuildingspec.com/#sle.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.

2.05 BATT INSULATION MATERIALS

- A. Dark Surfaced (Black), Flexible Glass-Fiber Blanket Insulation: ASTM C612, Type IA; ASTM C553, Types I, II, and III; or ASTM C665, Type I.
- 1. One side faced with black glass-fiber mat or black polymer finish.
 - 2. Where indicated, provide black, non-woven fiberglass facing on one side; with flame spread index of 25 or less, and smoke developed of 50 or less, when tested in accordance with ASTM E84.
 - 3. Thickness: 2 inches.
 - 4. NRC: 0.80.
 - 5. Manufacturers:
 - a. CertainTeed Corporation; CertaPro AcoustaBlanket Black: www.certainteed.com/#sle.
 - b. Johns Manville; Insul-SHIELD, Black-Faced (Black Core) Rolls: www.jm.com/#sle.
 - c. Knauf Insulation; Black Wall and Ceiling Liner M: www.knauf.com.
 - d. Owens Corning Corporation; SelectSound Black Acoustic Blanket: www.ocbuildingspec.com/#sle.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.

1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
 4. Formaldehyde Content: Zero.
 5. Exterior Walls:
 - a. Thermal Resistance: R-value of 19.
 - b. Thickness: 5-1/2 inch.
 6. Underside of Roof:
 - a. Thermal Resistance: R-value of 30.
 - b. Thickness: 10-1/4 inch.
 7. Facing: Aluminum foil, flame spread 25 rated; one side.
 8. Exposed Facing in Rooms and Enclosed Spaces: FSK (Foil-Scrim-Kraft), one side.
 - a. Class C per ASTM E84.
 9. Exposed Facing in Corridors and Enclosures for Exit Access Stairways and Exit Access Ramps: FSK (Foil-Scrim-Kraft), one side.
 - a. Class B per ASTM E84.
 10. Products:
 - a. CertainTeed Corporation: www.certainteed.com/#sle.
 - b. Johns Manville: www.jm.com/#sle.
 - c. Knauf Insulation: www.knauf.com.
 - d. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
1. Typical at interior walls.
 2. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
 3. Products:
 - a. Johns Manville; MinWool Sound Attenuation Fire Batts: www.jm.com/#sle.
 - b. Knauf Insulation; EcoBatt Insulation: www.knaufinsulation.com/#sle.
 - c. ROCKWOOL (ROXUL, Inc); COMFORTBATT: www.rockwool.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 ACCESSORIES

- A. Insulation Fasteners: Lengths of unfinished, 13 gauge, 0.072 inch high carbon spring steel with chisel or mitered tips, held in place by tension, length to suit insulation thickness and substrate, capable of securely supporting insulation in place.

- B. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
 - 1. Spindle: Copper-coated, low carbon steel; fully annealed; 0.105 inch (2.67 mm) in diameter; length to suit depth of insulation indicated.
 - 2. Plate: Perforated galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square.
 - 3. Finish: Painted matte black at exposed interior acoustical board application.
 - 4. Products:
 - a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
 - b. Eckel Industries of Canada; Stic-Klip Type N Fasteners.
 - c. Gemco; Spindle Type.
- C. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.
- D. Wire Mesh: Galvanized steel, hexagonal wire mesh.
- E. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT EXTERIOR WALLS

- A. Adhere 6 inches wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.
- B. Install boards horizontally on walls.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION OVER LOW SLOPE ROOF DECK

- A. Board Installation Over Roof Deck, General:
 - 1. See applicable roofing specification section for specific board installation requirements.
 - 2. Fasten insulation to deck in accordance with roofing manufacturer's written instructions and applicable Factory Mutual requirements.
 - 3. Do not apply more insulation than can be covered with roofing on the same day.

3.04 BATT INSTALLATION

- A. Install insulation in accordance with manufacturer's instructions.
- B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for additional requirements.

3.06 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 25 00
WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water-Resistive Barrier: Under exterior wall cladding, over sheathing or other substrate; not air tight or vapor retardant.
- B. Air Barriers: Materials that form a system to stop passage of air through joints between exterior walls and roof and joints around frames of openings in exterior walls.

1.02 RELATED REQUIREMENTS

- A. Section 07 21 00 - Thermal Insulation: Vapor retarder installed in conjunction with batt insulation.
- B. Section 072616 - Under-Slab Vapor Retarder: Vapor retarder under concrete slabs on grade.
- C. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.
- D. Section 07 92 00 - Joint Sealants: Sealing building expansion joints.

1.03 DEFINITIONS

- A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.
- B. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.
- C. Water-Resistive Barrier: Water-shedding barrier made of material that is moisture resistant, to the degree specified, intended to be installed to shed water without sealed seams.

1.04 REFERENCE STANDARDS

- A. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems.
- B. AATCC Test Method 127 - Water Resistance: Hydrostatic Pressure Test.
- C. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- D. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- E. ASTM D4869/D4869M - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- G. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.
- H. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials.

- I. ICC-ES AC188 - Acceptance Criteria for Roof Underlayments.
- J. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on material characteristics.
- C. Shop Drawings: Provide drawings of special joint conditions.
- D. Manufacturer's Installation Instructions: Indicate preparation.
- E. Testing Agency Qualification Statement.

1.07 MOCK-UP

- A. Install air barrier, vapor retarder, and water-resistive barrier materials in mock-up specified in Section 01 43 39.

1.08 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

1.09 WARRANTY

- A. Extended Warranty:
 - 1. Provide written guarantee from waterproofing membrane manufacturer, and furnish joint written warranty to District from waterproofing applicator and Contractor, covering all membranes, and other elements essential to be watertight and will continue to be watertight for a period of at least five years following Acceptance of the Work.
 - 2. Waterproofing membrane manufacturer, and waterproofing applicator and Contractor shall, upon request by District, make all repairs, at no cost to District and without dollar limit, as necessary to correct all waterproofing membrane material or workmanship defects.

PART 2 PRODUCTS

2.01 WEATHER BARRIER ASSEMBLIES

- A. Water-Resistive Barrier: Provide on exterior walls under exterior cladding.
 - 1. Use plastic sheet unless otherwise indicated.
 - 2. Under Portland cement stucco, use two separate layers of building paper, over plastic sheet.
 - 3. Under siding, use one layer of building paper, over plastic sheet.
- B. Air Barrier:

1. On outside surface of sheathing of exterior walls use air barrier sheet, mechanically fastened type.

2.02 WATER-RESISTIVE BARRIER MATERIALS (NEITHER AIR BARRIER OR VAPOR RETARDER)

- A. Building Paper: Asphalt-saturated Kraft building paper complying with requirements of ICC-ES AC38 Grade D.
 1. Water Penetration Resistance: Withstand a water head of 21 inches, minimum, for minimum of five hours, when tested in accordance with AATCC Test Method 127.
 2. Manufacturers:
 - a. Fortifiber Building Systems Group; Super Jumbo Tex 60 Minute: www.fortifiber.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Plastic Sheet: Polymeric-based sheet complying with requirements of ICC-ES AC38 Grade D with 60-minute water-resistance; do not use polyethylene sheet.
 1. See Air Barrier Materials.

2.03 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)

- A. Air Barrier Sheet, Mechanically Fastened:
 1. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
 2. Water Vapor Permeance: 5 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure A (Desiccant Method) at 73.4 degrees F.
 3. Water Penetration Resistance: Withstand a water head of 21 inches, minimum, for minimum of 5 hours, when tested in accordance with AATCC Test Method 127.
 4. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 180 days of weather exposure.
 5. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 50 or less, when tested in accordance with ASTM E84.
 6. Water Resistance: Comply with applicable water-resistive requirements of ICC-ES AC38.
 7. Seam and Perimeter Tape: Polyethylene self adhering type, mesh reinforced, 2 inches wide, compatible with sheet material; unless otherwise specified.
 8. Products:
 - a. Certainteed, Inc.; CertaWrap Weather-Protection Membrane: www.certainteed.com.
 - b. DuPont de Nemours, Inc; Tyvek CommercialWrap D with Tyvek Fluid Applied Flashing - Brush Formulation, Tyvek Fluid Applied Flashing and Joint Compound, FlexWrap NF, StraightFlash, StraightFlash VF, Tyvek Wrap Caps, and Tyvek Tape: building.dupont.com/#sle.
 - c. Fiberweb, Inc; Typar MetroWrap: www.typar.com/#sle.
 - d. Fortifiber Building Systems Group; WeatherSmart Commercial: www.fortifiber.com/#sle.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 ACCESSORIES

- A. Sealants, Tapes, and Accessories for Sealing Weather Barrier and Sealing Weather Barrier to Adjacent Substrates: As specified or as recommended by weather barrier manufacturer.
- B. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement is waived if not installed on a roof.
 - 1. Composition: Any material that meets physical requirements of ASTM D1970/D1970M with exceptions indicated.
 - 2. Minimum Requirements: Comply with requirements of ICC-ES AC188 for non-self-adhesive sheet.
 - 3. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.
 - 4. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.
 - 5. Water Vapor Permeance: 0.067 perm, when tested in accordance with ASTM E96/E96M Procedure A (desiccant method).
 - 6. Performance: Meet or exceed requirements for ASTM D226/D226M, Type II asphalt-saturated organic felt.
 - 7. Liquid Water Transmission: Passes ASTM D4869/D4869M.
 - 8. Functional Temperature Range: Minus 70 degrees F to 240 degrees F.
 - 9. Manufacturers:
 - a. Carlisle Coatings and Waterproofing, Inc.; CCW-705 TFW: www.carlisle-ccw.com.
 - b. CETCO ; Product Strong Seal SA; www.cetco.com.
 - c. DuPont de Nemours, Inc; DuPont FlexWrap: building.dupont.com/#sle.
 - d. DuPont de Nemours, Inc; DuPont StraightFlash: building.dupont.com/#sle.
 - e. DuPont de Nemours, Inc; DuPont VersaFlange: building.dupont.com/#sle.
 - f. Fortifiber Building Systems Group; FortiFlash: www.fortifiber.com/#sle.
 - g. Fortifiber Building Systems Group; FortiFlash Commercial: www.fortifiber.com/#sle.
 - h. GCP Applied Technologies; Perm-A-Barrier Detail Membrane: gcpat.com/en/solutions/products/perm-a-barrier-air-barrier-system.
 - i. InterWrap, Inc. Mission, BC Canada ; Product Titanium-PSU-30; www.interwrap.com.
 - j. Protecto Wrap; Jiffy Seal 140/60 Air/Vapor Barrier: www.protectowrap.com.
 - k. Soprema, Inc.; Product Lastobond Shield HT MU; www.soprema.us.
 - l. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Mechanical, Electrical or other Penetrations: Provide flashing panels to weatherproof plumbing, HVAC, fire sprinkler and electrical penetrations in exterior walls combined with this section and Section 07 62 00 - Sheet Metal Flashing and Trim.
- D. Fasteners with Self-Gasketing Washers: Commercial building wrap manufacturer's recommended pneumatically or hand-applied fasteners with 1 inch diameter, high-density polyethylene cap washers with UV inhibitors.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide DuPont de Nemours, Inc.; Tyvek Wrap Caps or equal.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions are ready to accept the work of this section.

3.02 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- B. Clean and prime substrate surfaces to receive adhesives in accordance with manufacturer's instructions.

3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions.
- B. Water-Resistive Barriers: Install continuous barrier over surfaces indicated, with sheets lapped to shed water but with seams not sealed.
 - 1. Apply water-resistive barrier complying with:
 - a. Section 1404.2 of the CBC.
- C. Air Barriers: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
 - 1. Sheathing materials that serve as an air barrier shall comply with California Energy Code Table 140.3-A Section 140.3(a)9 Air Barriers A and B exceptions as listed.
- D. Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
- E. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.
- F. Mechanically Fastened Sheets - On Exterior:
 - 1. Install sheets shingle-fashion to shed water, with seams generally horizontal.
 - 2. Overlap seams as recommended by manufacturer but at least 6 inches.
 - 3. Overlap at outside and inside corners as recommended by manufacturer but at least 12 inches.
 - 4. Attach to framed construction with fasteners extending through sheathing into framing. Space fasteners at 12 to 18 inches on center along each framing member supporting sheathing.
 - 5. For applications specified to be air tight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners recommended by the manufacturer.
 - 6. Where stud framing rests on concrete or masonry, extend lower edge of sheet at least 4 inches below bottom of framing and seal to foundation with sealant.
 - 7. Install water-resistive barrier over jamb flashings.
 - 8. Install air barrier and vapor retarder underneath the jamb flashings.

9. Install head flashings under weather barrier.
 10. At openings to be filled with frames having nailing flanges, wrap excess sheet into opening; at head, seal sheet over flange and flashing.
 11. Penetration Sealing: Seal all penetrations through paper from backside using non-staining sealant as specified in Section 07 90 05 - Joint Sealers.
- G. Self-Adhered Sheets:
1. At sloped wall segments, all caps, parapets and horizontal projections, surfaces, all locations where products are secured through cement plaster and other locations where waterproof underlayment is indicated; install minimum one layer of self-adhesive sheet. Provide in addition to and integrated with weather barriers as indicated in this section.
 2. Penetration Flashing: Install self-adhering waterproof backing in weatherboard fashion following Plaster Institute recommendations.
 3. Prepare substrate in manner recommended by sheet manufacturer; fill and tape joints in substrate and between dissimilar materials.
 4. Lap sheets shingle-fashion to shed water and seal laps air tight.
 5. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
 6. Use same material, or other material approved by sheet manufacturer for the purpose, to seal to adjacent construction and as flashing.
 7. At wide joints, provide extra flexible membrane allowing joint movement.
- H. Openings and Penetrations in Exterior Weather Barriers: Comply with Drawing details. As a minimum provide the following:
1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
 2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
 3. At openings to be filled with non-flanged frames, seal weather barrier to each side of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
 4. At head of openings, install flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.
 5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
 6. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to train installers and observe subject test-wall areas and installations.

- C. Testing Agency: Engage a qualified third-party testing agency to perform tests and inspections.
- D. Water-Spray Test: Provide water spray quality test of installed weather barrier components in accordance with a modified AAMA 501.2 during construction process and before installation of interior finishes.
 - 1. Perform a minimum of two tests in each designated area as directed by Architect.
 - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
 - 3. Testing: Water test the complete weather barrier after completion by spraying with hose heavily for 5 minutes. Repair all leaks discovered by testing procedures and repeat test until leak-free performance is achieved.
 - 4. Provide written report to Architect and Project Inspector (IOR).
- E. Coordination of ABAA Tests and Inspections:
 - 1. Provide testing and inspection required by ABAA QAP.
 - 2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
 - 3. Cooperate with ABAA testing agency.
 - 4. Allow access to air barrier work areas and staging.
 - 5. Do not cover air barrier work until tested, inspected, and accepted.
- F. Do not cover installed weather barriers until required inspections have been completed.
- G. Take digital photographs of each portion of the installation prior to covering up.

3.05 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.
- B. Do not leave paper- or felt-based barriers exposed to weather for longer than one week.

END OF SECTION

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, and downspouts.
- B. Sealants for joints within sheet metal fabrications.
- C. Precast concrete splash pads.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood nailers for sheet metal work.
- B. Section 06 10 00 - Rough Carpentry: Field fabricated roof curbs.
- C. Section 07 25 00 - Weather Barriers: Flexible flashing.
- D. Division 7 - Thermal and Moisture Protection: Roofing system.
- E. Section 07 72 00 - Roof Accessories: Manufactured metal roof curbs.
- F. Section 07 92 00 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.
- G. Section 09 91 13 - Exterior Painting: Field painting.

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix).
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 1. Use 2015 as indicated in 2019 CBC Referenced Standards.
- C. ASTM B32 - Standard Specification for Solder Metal.
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
 - 1. Use 2014a as indicated in 2019 CBC Referenced Standards.
- E. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - 1. Use 2015a as indicated in 2019 CBC Referenced Standards.
- F. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness.
- G. ASTM D3161/D3161M - Standard Test Method for Wind-Resistance of Steep Slope Roofing Products (Fan-Induced Method).
 - 1. Use 2015 as indicated in 2019 CBC Referenced Standards.
- H. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension.
- I. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free.

1. Use 2007(2012)e1 as indicated in 2019 CBC Referenced Standards.
- J. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.
- K. ASTM D792 - Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
- L. SMACNA (ASMM) - Architectural Sheet Metal Manual.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Samples: Submit two samples 6 x 6 inch in size illustrating metal finish color.

1.06 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.
- B. Maintain one copy of each document on site.
- C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

- A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gauge, (0.0239 inch) thick base metal.
- B. Membrane Clad Flashing: Refer to Section 07 54 00 - Thermoplastic Membrane Roofing.
- C. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gauge, (0.0239) inch thick base metal, shop pre-coated with PVDF coating.
 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
 2. Color: As selected by Architect from manufacturer's custom colors.

2.02 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
 1. Coping and Cap Flashing:

- a. Coping and caps of type and profile indicated on Drawings, 20 gage galvanized sheet metal, with integral expansion.
- 2. Drips at Doors and Windows:
 - a. Provide 20 gage galvanized sheet metal drips at head of all exterior doors and windows where no roof or overhang protection occurs.
 - b. Extend drips 2 inches beyond jambs, unless noted otherwise.
- B. Fabricate cleats of same material as sheet, minimum 4 inches wide, except at continuous strips, interlocking with sheet.
 - 1. Typically use continuous strips.
- C. Form pieces in longest possible lengths.
- D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- E. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
 - 1. Typical Seams: Overlapped and sealed seams.
 - 2. Coping Seams: Lock seams, flattened.
 - 3. Seams, Horizontal to Vertical Transitions: Solder joints.
 - 4. Soldered seams: Tin edges to be seamed, form seams, and solder.
- F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- G. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- H. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

2.03 GUTTER AND DOWNSPOUT FABRICATION

- A. Gutters: SMACNA (ASMM), Rectangular profile.
- B. Downspouts: Profile as indicated.
 - 1. Steel Pipe Downspouts: See section 05 50 00 - Metal Fabrications.
 - a. Provide steel pipe downspouts where indicated. Fabricate from galvanized, Schedule 40 steel pipe or tube of sizes indicated. Weld joints and grind smooth. Shop prime with zinc-rich primer for field painting.
 - b. Provide necessary transitions from steel pipe to gage metal roof gutters and gutter outlets.
 - c. Hold downspouts in position 1 inch clear of walls with galvanized steel straps at spacing indicated, securely fastened to wall.
 - 1) Provide heavy duty mounting bracket hardware for attachment to structural steel.
- C. Scuppers and Overflows: 24 gage galvanized sheet metal, as indicated on Drawings and complying with referenced SMACNA Manual Figure number. Fabricate with minimum 6 inch flanges.
- D. Gutters and Downspouts: Size indicated.

- E. Accessories: Profiled to suit gutters and downspouts.
 - 1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
 - 2. Gutter Supports: Straps.
 - 3. Downspout Supports: Straps.
 - 4. Strainers 10 gage galvanized steel wire basket type, riveted and soldered into place.
- F. Splash Pans: Same metal type as downspouts, formed to 12 x 18 inches size; rolled sides of 1 inch high for inverted pan placement.
- G. Splash Pads: Precast concrete type, of size and profiles indicated; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment.
- H. Downspout Boots: Steel.
- I. Downspout Extenders: Same material and finish as downspouts.
- J. Seal metal joints.

2.04 EXTERIOR PENETRATION FLASHING PANELS

- A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.
- B. Basis of Design Product: Quickflash Weatherproofing Flashing Panels as manufactured by Quickflash Weatherproofing Products, Inc., www.quickflashproducts.com, or equal.
- C. Coordinate with each trade to provide specific models correctly sized for each individual pipe, duct, conduit, box, or panel penetration in each application as occurs in the building envelope.
- D. Plumbing Flashing Panels:
 - 1. Materials:
 - a. Panel: Combination of high-density polyethylene (HDPE) and low-density polyethylene (LDPE).
 - 1) HDPE, Specific Gravity, ASTM D1505: 0.953 g/cm³.
 - 2) HDPE, Tensile Strength at Yield, ASTM D638: 3,100 psi.
 - 3) LDPE, Specific Gravity, ASTM D792: 0.917 g/cm³.
 - 4) LDPE, Tensile Strength at Yield, ASTM D638: 1,300 psi.
 - b. Weatherproof Seal: Thermoplastic elastomer.
 - 1) Hardness, ASTM D2240, Shore A, 10 Seconds: 46.
 - 2) Specific Gravity, ASTM D792: 1.05 g/cm³.
 - 3) Tensile Strength, ASTM D412: 490 psi.
- E. Electrical Flashing Panels:
 - 1. Material: Thermoplastic elastomer.
 - a. Hardness, ASTM D2240, Shore A, 10 Seconds: 93.
 - b. Specific Gravity, ASTM D792: 1.05 g/cm³.
 - c. Tensile Strength, ASTM D412: 1,300 psi.

2.05 ACCESSORIES

- A. Fasteners: Galvanized steel, with soft neoprene washers.
- B. Miscellaneous Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of the Work, matching or compatible with material being installed, non-corrosive, size and gage required for performance.
- C. Underlayment: Self-adhesive sheet flexible flashing complying with ASTM D1970/D1970M.
 - 1. Adhesives: Type recommended by flexible flashing sheet manufacturer for waterproof/weather-resistant seaming and adhesive application of flashing sheet.
- D. Slip Sheet: Rosin sized building paper.
- E. Primer: Zinc chromate type.
- F. Concealed Sealants: Non-curing butyl sealant.
- G. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
 - 1. Epoxy Seam Sealer: 2-part non-corrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.
- H. Plastic Cement: ASTM D4586/D4586M, Type I.
- I. Reglets: Surface mounted type, galvanized steel; face and ends covered with plastic tape.
 - 1. Reglets:
 - a. Surface-applied, Fry Springlok Flashing System Type SM, or equal.
 - b. Recessed, Fry Springlok Flashing System Type ST, or equal.
 - 2. Performance Requirements
 - a. Reglet and flashing manufacturer shall certify that the system to be installed has been tested to resist 110 MPH wind loads when tested in accordance with ASTM D3161/D3161M for a minimum period of two hours.
 - 3. Specified Manufacturer: Fry Reglet Corporation, www.fryreglet.com.
 - 4. Acceptable Manufacturers:
 - a. O'Keefes, Inc., www.okeefes.com.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
 - 5. Reglets and Flashing, General: Springlok Flashing, as manufactured by Fry Reglet Corporation, or equal, formed metal reglet with snap-in metal counter-flashing, factory-fabricated, with a minimum opening of 1/4 inch and a depth of 1-1/4 inches.
 - a. Reglet material: 24 gage galvanized steel.
 - b. Flashing material: 0.020 inch Type 302 stainless steel.
 - c. End laps: Factory-formed, 1 inch at reglets and 3 inches at flashings.
 - d. Corners: Provide built-up mitered corner pieces for internal and external angles.
 - e. Wind clips: Provide Fry Windlok Clip, sheet metal clips to be secured to wall prior to installing flashing in reglet, and to be bent up over bottom edge of flashing.
 - 6. Accessories:
 - a. Corners: Factory-manufactured, mitered inside and outside corners.

- b. Splices: Factory-manufactured, integral component of reglet and flashing system.
- J. Solder: ASTM B32; Sn50 (50/50) type.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.
- C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

- A. Conform to drawing details and the following:
 - 1. Scuppers: SMACNA Architectural Sheet Metal Manual, Detail 1-26 through 1-28, 1-30B.
 - 2. Downspouts: SMACNA Architectural Sheet Metal Manual, Detail 1-32B, 1-32F, 1-35B.
 - 3. Parapet Coping/Cap: SMACNA Architectural Sheet Metal Manual, Detail 3-1, 3-3(18 Butt Seam w/ backing plates).
 - 4. Roof - Penetration Flashing: SMACNA Architectural Sheet Metal Manual, Detail 4-13 through 4-16.
- B. Insert flashings into reglets to form tight fit; secure in place with lead wedges; pack remaining spaces with lead wool; seal flashings into reglets with sealant.
- C. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..
- D. Apply plastic cement compound between metal flashings and felt flashings.
- E. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
 - 1. Counterflashings Installation: Install counterflashing in reglets to form tight fit, either by snap-in seal arrangement or by securing in place with lead wedges spaced 18 inches on center maximum. Pack remaining spaces with lead wool.
 - a. Except where indicated or specified otherwise, insert counterflashing in reglets, extending down vertical surfaces over upturned vertical leg of base flashings not less than 3 inches.
 - b. Form counterflashings to required shapes before installation.
 - c. Lengths of metal counterflashings shall not exceed 120 inches.
 - d. Where stepped counterflashings are required, counterflashing may be installed in short lengths or may be of the preformed one-piece type.
 - e. Provide factory- or shop-form corners not less than 12 inches from the angle.

- f. Provide end laps in counterflashings not less than 3 inches and make laps weathertight with sealant.
 - g. Turn up concealed edge of counterflashings built into masonry or concrete walls not less than 1/4 inch and extend not less than 2 inches into wall.
 - h. Fold exposed edges of counterflashings 1/2 inch.
 - i. Install counterflashing to provide a spring action against base flashing.
2. Thru-Wall Flashing:
- a. Start flashing 1/2 inch behind exposed face of wall and extend through wall.
 - b. Lap-seam joints and seal with sealant.
 - c. Provide sealant around penetrations through flashing.
- F. Seal metal joints watertight.
- G. Secure gutters and downspouts in place with concealed fasteners.
- 1. Install downspouts not less than 1 inch clear from walls.
 - 2. Fasten downspouts to walls at top, bottom, and at an intermediate point not exceeding 60 inches on center, with leader straps or concealed rack-and-pin type fasteners.
- H. Connect downspouts to downspout boots, and grout connection watertight.
- I. Set splash pads under downspouts. Set in place with adhesive.
- J. Scuppers and Overflows Installation:
- 1. Mechanically fasten and solder joints.
 - 2. Fold outside edges under 1/2 inch on all sides.
 - 3. Join the bottom edge to closure flange, where necessary, and form ridge to act as a gravel stop around scupper inlet.
 - 4. Coat interior of scuppers and overflows with bituminous plastic cement.
- K. Metal Flashing at Wall and Roof Penetrations and Equipment Supports:
- 1. Exception:
 - a. Roofing: Where single ply system assembly has provided flashing for penetrations.
 - 2. Penetrations through Single Ply (ex; PVC or TPO) membrane:
 - a. Roofing contractor is to install Single Ply (ex; PVC or TPO) cones and or flashing per roofing manufacturers standard details.
 - b. Roofing contractor is to provide sealant and stainless draw band to seal Single Ply (ex; PVC or TPO) cones and or flashings in accordance with the roofing manufacturer's standard details.
 - 3. Provide metal flashing for all pipes, ducts, and conduits projecting through the roof surface and for equipment supports, guy wire anchors, and similar items supported by or attached to the roof deck or walls.
 - a. Goose-necks, rainhoods, power roof ventilators, and other plumbing, HVAC and electrical products are specified as appropriate in:
 - 1) Division 21 - Fire Suppression.
 - 2) Division 22 - Plumbing.
 - 3) Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC).
 - 4) Division 26 - Electrical.

- b. Coordinate also with sheet metal curbs specified in Section 07 72 00.
- 4. Single Pipe Vents: Provide lead flashing as indicated on Drawings.
 - a. Set flange of sleeve in bituminous plastic cement and nail 3 inches on centers.
 - b. Bend the top of sleeve over and extend down into the vent pipe a minimum of 2 inches.
 - c. For long runs or long rises above the deck, where it is impractical to cover the vent pipe with lead, use a two-piece formed galvanized sheet metal housing.
 - d. Set metal housing with a metal sleeve having a 4 inch roof flange in bituminous plastic cement and nailed 3 inches on center.
 - e. Extend sleeve a minimum of 8 inches above the roof deck and lapped a minimum of 3 inches by a metal hood secured to the vent pipe by a draw band.
 - f. Seal the area of hood in contact with vent pipe with specified sealant. Sealants are specified in Section 07 92 00 - Joint Sealants.
- 5. Roof Penetration Flashing:
 - a. Base Flashing:
 - 1) Extend flange onto roof 6 inches minimum away from penetration.
 - 2) Extend flange upward around penetration to at least 8 inches above roofing felts.
 - 3) Fold back upper and side roof flange edges 1/2 inch minimum.
 - 4) Lap and solder joints.
 - b. Counterflashing: Overlap base flashing 1 inch minimum with storm collar sloped away from penetration. Secure to penetration with draw band and sealant.
- 6. Equipment Support and Pad Flashing:
 - a. Fully cap support and pad.
 - b. Overlap base flashing 4 inches.
 - c. Lap and solder joints.
 - d. Provide sealant around penetrations through-flashing.

3.04 CLEANING AND PREPARATION FOR FIELD PAINTING

- A. Metal Preparation: As sheet metal installation progresses, neutralize excess flux with 5 to 10 percent washing soda solution, and thoroughly rinse.
- B. Repairs: Repair or replace damaged and deformed sheet metal.
- C. Cleaning: Wash down exposed surfaces and remove stains, scrap and debris such that sheet metal is ready to receive field painting and related Work.
 - 1. Wash down exposed surfaces and remove soiling, dust, contamination from steel wool and drilling residue, and other scrap and debris.
 - 2. Scrub surfaces with detergent solution as necessary to remove grease and oil films, handling marks, and stains.

3.05 FIELD PAINTING

- A. Field Painting: Field-paint exposed sheet metal for corrosion resistance and decorative purposes. Field finish painting is specified in Section 09 91 13 - Exterior Painting.

3.06 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.07 SCHEDULE

- A. Fascia and Cornices: Prefinished.
- B. Gutters and Downspouts: Prefinished to match adjacent wall color.
- C. Scuppers: Thermoplastic membrane cladding, when adjacent to and a part of the roofing.
- D. Coping, Cap, Parapet, Sill and Ledge Flashings: Thermoplastic membrane cladding, when adjacent to and a part of the roofing.
- E. Flashings Associated with Roofing Tiles, including Valley, Hip, Ridge, Eave, Gutter Edge, Gable Edge, Chimney: Pre-finished
- F. Sheet Metal Roof Expansion Joint Covers, and Roof-to-Wall Joint Covers: Pre-finished to match adjacent wall color.
- G. Counterflashings at Roofing Terminations (over roofing base flashings): Thermoplastic membrane cladding.
- H. Counterflashings at Curb-Mounted Roof Items: .Exposed galvanized, when behind a parapet; pre-finished otherwise
- I. Roofing Penetration Flashings, for Pipes, Structural Steel, and Equipment Supports: Exposed galvanized, when behind a parapet; pre-finished otherwise.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Joint backings and accessories.
- C. District-provided field quality control.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.
- B. Section 07 25 00 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.
- C. Section 08 71 00 - Door Hardware: Setting exterior door thresholds in sealant.
- D. Section 09 21 16 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
- E. Division 23 - Heating, Ventilation and Air-Conditioning (HVAC): Duct sealants.

1.03 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer.
- B. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants.
- C. ASTM C834 - Standard Specification for Latex Sealants.
- D. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.
- E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
- F. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.
- G. ASTM C1193 - Standard Guide for Use of Joint Sealants.
- H. ASTM C1311 - Standard Specification for Solvent Release Sealants.
- I. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.
- J. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
- K. SWRI (VAL) - SWR Institute Validated Products Directory.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.

1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 2. List of backing materials approved for use with the specific product.
 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 4. Substrates the product should not be used on.
 5. Substrates for which use of primer is required.
 6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
 7. Sample product warranty.
 8. Certification by manufacturer indicating that product complies with specification requirements.
 9. SWRI Validation: Provide currently available sealant product validations as listed by SWRI (VAL) for specified sealants.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
 - D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
 - E. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.
 - F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.
 - G. Installation Plan: Submit at least four weeks prior to start of installation.
 - H. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.
 - I. Field Quality Control Plan: Submit at least two weeks prior to start of installation.
 - J. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.
 - K. Installation Log: Submit filled out log for each length or instance of sealant installed.
 - L. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.
 - M. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of each referenced document covering installation requirements on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

- C. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
- D. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
 - 1. Adhesion Testing: In accordance with ASTM C794.
 - 2. Compatibility Testing: In accordance with ASTM C1087.
 - 3. Allow sufficient time for testing to avoid delaying the work.
 - 4. Deliver to manufacturer sufficient samples for testing.
 - 5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
 - 6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.
- E. Installation Plan: Include schedule of sealed joints, including the following.
 - 1. Joint width indicated in Contract Documents.
 - 2. Joint depth indicated in Contract Documents; to face of backing material at centerline of joint.
 - 3. Method to be used to protect adjacent surfaces from sealant droppings and smears, with acknowledgement that some surfaces cannot be cleaned to like-new condition and therefore prevention is imperative.
 - 4. Approximate date of installation, for evaluation of thermal movement influence.
 - 5. Installation Log Form: Include the following data fields, with known information filled out.
 - a. Unique identification of each length or instance of sealant installed.
 - b. Location on project.
 - c. Substrates.
 - d. Sealant used.
 - e. Stated movement capability of sealant.
 - f. Primer to be used, or indicate as "No primer" used.
 - g. Size and actual backing material used.
 - h. Date of installation.
 - i. Name of installer.
 - j. Actual joint width; provide space to indicate maximum and minimum width.
 - k. Actual joint depth to face of backing material at centerline of joint.
 - l. Air temperature.
- F. Preinstallation Field Adhesion Test Plan: Include destructive field adhesion testing of one sample of each combination of sealant type and substrate, except interior acrylic latex sealants, and include the following for each tested sample.
 - 1. Identification of testing agency.
 - 2. Name(s) of sealant manufacturers' field representatives who will be observing

3. Preinstallation Field Adhesion Test Log Form: Include the following data fields, with known information filled out.
 - a. Substrate; if more than one type of substrate is involved in a single joint, provide two entries on form, for testing each sealant substrate side separately.
 - b. Test date.
 - c. Location on project.
 - d. Sealant used.
 - e. Stated movement capability of sealant.
 - f. Test method used.
 - g. Date of installation of field sample to be tested.
 - h. Date of test.
 - i. Copy of test method documents.
 - j. Age of sealant upon date of testing.
 - k. Test results, modeled after the sample form in the test method document.
 - l. Indicate use of photographic record of test.

- G. District will employ an independent testing agency to perform the field quality control inspection and testing as referenced in PART 3 of this section and as follows, to prepare and submit the field quality control plan and log, and to provide recommendations of remedies in the case of failure.
 1. Contractor shall cooperate with testing agency and repair failures discovered and destructive test location damage.

- H. Field Quality Control Plan:
 1. Visual inspection of entire length of sealant joints.
 2. Non-destructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
 - a. For each different sealant and substrate combination, allow for one test every 12 inches in the first 10 linear feet of joint and one test every 24 inches thereafter.
 - b. If any failures occur in the first 10 linear feet, continue testing at 12 inches intervals at no extra cost to District.
 3. Destructive field adhesion testing of sealant joints, except interior acrylic latex sealant.
 - a. For each different sealant and substrate combination, allow for one test every 100 feet in the first 1000 linear feet, and one test per 1000 linear feet thereafter, or once per floor on each elevation.
 - b. If any failures occur in the first 1000 linear feet, continue testing at frequency of one test per 500 linear feet at no extra cost to District.
 4. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

- I. Field Adhesion Test Procedures:
 1. Allow sealants to fully cure as recommended by manufacturer before testing.
 2. Have a copy of the test method document available during tests.

3. Take photographs or make video records of each test, with joint identification provided in the photos/videos; for example, provide small erasable whiteboard positioned next to joint.
 4. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
 5. When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
 6. Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to District.
 7. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.
- J. Non-Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.
1. Record results on Field Quality Control Log.
 2. Repair failed portions of joints.
- K. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.
1. Sample: At least 18 inches long.
 2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the "1 inch mark" is that distance from the substrate, the test has failed.
 3. If either adhesive or cohesive failure occurs prior to minimum elongation, take necessary measures to correct conditions and re-test; record each modification to products or installation procedures.
 4. Record results on Field Quality Control Log.
 5. Repair failed portions of joints.
- L. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or other applicable method as recommended by manufacturer.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.

1. Adhesives Technology Corporation: www.atcepoxy.com.
2. Bostik Inc: www.bostik-us.com.
3. Dow Corning Corporation: www.dowcorning.com/construction/sle.
4. Fortifiber Building Systems Group: www.fortifiber.com/sle.
5. Hilti, Inc: www.us.hilti.com/#sle.
6. Master Builders Solutions by BASF: www.master-builders-solutions.basf.us/en-us/#sle.
7. Momentive Performance Materials, Inc (formerly GE Silicones):
www.momentive.com/sle.
8. Pecora Corporation: www.pecora.com.
9. QUIKRETE Companies: www.quikrete.com/#sle.
10. Sherwin-Williams Company: www.sherwin-williams.com.
11. Sika Corporation: www.usa-sika.com.
12. Specified Technologies Inc: www.stifirestop.com/#sle.
13. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
14. W.R. Meadows, Inc: www.wrmeadows.com/sle.
15. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:

1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
 - a. Wall expansion and control joints.
 - b. Construction joints in cast-in-place concrete
 - c. Joints between door, window, and other frames and adjacent construction.
 - d. Joints between different exposed materials.
 - e. Openings below ledge angles in masonry.
 - f. Control and expansion joints in ceilings and other overhead surfaces.
 - g. Other joints indicated below.
2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
 - a. Joints between door, window, and other frames and adjacent construction.
 - b. Control and expansion joints on exposed interior surfaces of exterior walls.
 - c. Perimeter joints of exterior openings where indicated.
 - d. Control and expansion joints in tile.
 - e. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
 - 1) Exception: Such gaps and openings in gypsum board finished stud walls and suspended ceilings.

- 2) Exception: Through-penetrations in sound-rated assemblies that are also fire-rated assemblies.
- f. Other joints indicated below.
- 3. Do not seal the following types of joints.
 - a. Intentional weepholes in masonry.
 - b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
 - c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
 - d. Joints where installation of sealant is specified in another section.
 - e. Joints between suspended panel ceilings/grid and walls.
- B. Type EP-1 - Exterior Joints: Use non-sag non-staining silicone sealant at storefront and openings, unless otherwise indicated.
- C. Type SM-1 - Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing.
- D. Type SM-1 - Lap Joints between Manufactured Metal Panels: Butyl rubber, non-curing.
- E. Type IP-1 - Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
- F. Type IA-1 - Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
- G. Type FS-1 - Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
- H. Type IA-1 - In Sound-Rated Assemblies: Acrylic emulsion latex sealant.
- I. Interior Wet Areas: kitchens and lab areas; fixtures in wet areas include plumbing fixtures, countertops, cabinets, and other similar items.
- J. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

2.03 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide products with levels of volatile organic compound (VOC) content as indicated in Section 01 61 16.
- B. Colors: As indicated on the drawings. Match adjacent surface.

2.04 NONSAG JOINT SEALANTS

- A. Type NS-1 - Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 50 percent, minimum.
 - 2. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
 - 3. Color: To be selected by Architect from manufacturer's full range.
 - 4. Cure Type: Single-component, neutral moisture curing.
 - 5. Service Temperature Range: Minus 20 to 180 degrees F.
 - 6. Manufacturers:
 - a. Dow Chemical Company; DOWSIL 790 Silicone Building Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.

- b. Dow Chemical Company; DOWSIL 791 Silicone Weatherproofing Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
 - c. Dow Chemical Company; DOWSIL 795 Silicone Building Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
 - d. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com/sle.
 - e. Pecora Corporation; Pecora 864 NST (Non-Staining Technology): www.pecora.com/#sle.
 - f. Sika Corporation; Sikasil WS-290: www.usa-sika.com/#sle.
 - g. Sika Corporation; Sikasil WS-295: www.usa-sika.com/#sle.
 - h. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
- 1. Movement Capability: Plus and minus 25 percent, minimum.
 - 2. Color: To be selected by Architect from manufacturer's full range.
 - 3. Cure Type: Single-component, neutral moisture curing
 - 4. Service Temperature Range: Minus 65 to 180 degrees F.
 - 5. Manufacturers:
 - a. Fortifiber Building Systems Group; Moistop Sealant: www.fortifiber.com/#sle.
 - b. Dow Chemical Company; DOWSIL 999-A Building and Glazing Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
 - c. Pecora Corporation; Pecora 890FTS (Field Tintable Smooth): www.pecora.com/#sle.
 - d. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com/sle.
 - e. Sherwin-Williams Company; Silicone Rubber All Purpose Sealant: www.sherwin-williams.com/#sle.
 - f. Sika Corporation; Sikasil GP: www.usa-sika.com/#sle.
 - g. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Type FS-1 - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
- 1. Color: White.
 - 2. Manufacturers:
 - a. BASF Construction Chemicals-Building Systems; OmniPlus, by Sonneborn Building Products Div.: www.buildingsystems.basf.com.
 - b. Dow Corning Corporation; 786 Silicone Sealant: www.dowcorning.com.
 - c. Momentive Performance Materials, Inc (GE Silicones products); Silpruf SCS 1700 Sanitary: www.momentive.com.
 - d. Pecora Corporation; Pecora 898 NST (Non-Staining Technology): www.pecora.com/#sle.
 - e. Sika Corporation; Sikasil GP: www.usa-sika.com/#sle.

- f. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Type PS-1 - Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
 - 1. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
 - 2. Color: To be selected by Architect from manufacturer's full range.
 - 3. Service Temperature Range: Minus 40 to 180 degrees F.
 - 4. Manufacturers:
 - a. Master Builders Solutions by BASF; MasterSeal NP1: www.master-builders-solutions.basf.us/en-us/#sle.
 - b. Sherwin-Williams Company; Stampede-1/-TX Polyurethane Sealant: www.sherwin-williams.com/#sle.
 - c. Sika Corporation; Sikaflex-1a: www.usa-sika.com/#sle.
 - d. Sika Corporation; Sikaflex-15 LM: www.usa-sika.com/#sle.
 - e. W. R. Meadows, Inc; POURTHANE NS: www.wrmeadows.com/#sle.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Type IA-1 - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
 - 1. Color: To be selected by Architect from manufacturer's full range.
 - 2. Grade: ASTM C834; Grade Minus 18 Degrees C (0 Degrees F).
 - 3. Manufacturers:
 - a. Hilti, Inc; CP 506 Smoke and Acoustical Sealant: www.us.hilti.com/#sle.
 - b. Hilti, Inc; CP 572 Smoke and Acoustical Spray Sealant: www.us.hilti.com/#sle.
 - c. Pecora Corporation: www.pecora.com.
 - d. Sherwin-Williams Company; 950A Siliconized Acrylic Latex Caulk: www.sherwin-williams.com/#sle.
 - e. Specified Technologies Inc; Smoke N' Sound Acoustical Sealant: www.stifirestop.com/#sle.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Non-Curing Butyl Sealant: Solvent-based; ASTM C1311; single component, non-sag, non-skinning, non-hardening, non-bleeding; vapor-impermeable; intended for fully concealed applications.

2.05 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
 - 1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type C - Closed Cell Polyethylene.
 - 2. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

- C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.
- D. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.
 1. Test each sample as specified in PART 1 under QUALITY ASSURANCE article.
 2. Notify Architect of date and time that tests will be performed, at least seven days in advance.
 3. Arrange for sealant manufacturer's technical representative to be present during tests.
 4. Record each test on Preinstallation Adhesion Test Log as indicated.
 5. If any sample fails, review products and installation procedures, consult manufacturer, or take whatever other measures are necessary to ensure adhesion; re-test in a different location; if unable to obtain satisfactory adhesion, report to Architect.
 6. After completion of tests, remove remaining sample material and prepare joint for new sealant installation.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Perform acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:

1. Width/depth ratio of 2:1.
 2. Neck dimension no greater than 1/3 of the joint width.
 3. Surface bond area on each side not less than 75 percent of joint width.
- E. Install bond breaker backing tape where backer rod cannot be used.
 - F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
 - G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
 - H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 FIELD QUALITY CONTROL

- A. District will employ an independent testing agency to perform field quality control inspection and testing as specified in PART 1 under QUALITY ASSURANCE article.
- B. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.
- C. Destructive Adhesion Testing: If there are any failures in first 1000 linear feet, notify Architect immediately.
- D. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.
- E. Repair destructive test location damage immediately after evaluation and recording of results.

3.05 POST-OCCUPANCY

- A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

END OF SECTION

SECTION 08 06 71
DOOR HARDWARE SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preliminary schedule of door hardware sets for swinging as indicated on drawings.

1.02 RELATED REQUIREMENTS

- A. Section 08 71 00 - Door Hardware: Requirements to comply with in coordination with this section.

1.03 REFERENCE STANDARDS

- A. BHMA (CPD) - Certified Products Directory.
- B. BHMA A156.3 - American National Standard for Exit Devices.
- C. BHMA A156.5 - American National Standard for Cylinders and Input Devices for Locks.
- D. BHMA A156.13 - American National Standard for Mortise Locks & Latches Series 1000.
- E. BHMA A156.18 - American National Standard for Materials and Finishes.
- F. DHI (H&S) - Sequence and Format for the Hardware Schedule.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Comply with submittal requirements as indicated in Section 08 71 00.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Only manufacturers listed in Door Hardware Schedule or Section 08 71 00 are considered acceptable, unless noted otherwise.
- B. Obtain each type of door hardware as indicated from a single manufacturer and single supplier.
- C. Products are listed and certified compliant with specified standards by BHMA (CPD).
- D. Manufacturer's Abbreviations: Coordinate with manufacturers listed in Section 08 71 00.
 - 1. GLY - Glynn Johnson, Allegion, PLC.
 - 2. IVE - Ives, Allegion, PLC.
 - 3. KNX/KNO - Knox Company.
 - 4. LCN - LCN Commercial Division, Allegion, PLC.
 - 5. SCE - Schlage Electronic Security, Allegion, PLC
 - 6. SCH/SC - Schlage Lock Company, Allegion, PLC.
 - 7. VON - Von Duprin, Allegion, PLC..

8. ZER - Zero Industries, Inc., Allegion, PLC.
9. TBD - To be determined.
10. BYO/OT - By Others.

2.02 DESCRIPTION

- A. Door hardware sets provided represent the design intent, they are only a guideline and should not be considered a detailed or complete hardware schedule.
 1. Provide door hardware item(s) as required for similar purposes, even when item is not listed for a door in Door Hardware Schedule.
 2. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and functionality.
 3. Door hardware supplier is responsible for providing proper size and hand of door for products required in accordance with Door Hardware Schedule and as indicated on drawings.
 4. Quantities listed are for each Pair (PR) of doors, or for each Single (SGL) door, as indicated in hardware sets.

2.03 LOCK FUNCTION CODES

- A. Function Codes for Cylindrical Locks: Complying with BHMA A156.5.
- B. Function Codes for Mortise Locks: Complying with BHMA A156.13.
- C. Function Codes for Exit Devices: Complying with BHMA A156.3.

2.04 FINISHES

- A. Finishes: Complying with BHMA A156.18.

PART 3 EXECUTION

3.01 DOOR HARDWARE SCHEDULE

- A. Organize listing of door hardware components within each hardware set in compliance with 10-Part scheduling sequence indicated in DHI (H&S), unless otherwise indicated.
- B. See door schedule in drawings for hardware set assignments.
- C. No hardware shall be ordered until Finished Hardware has been reviewed and approved by Architect's hardware consultant.
- D. Provide Factory order numbers for all products supplied on this project as part of close out documents for District's warranty records.
- E. Any door count quantity shown in the HW set listings is for reference only. Contractor shall verify all door quantities with the Architectural Drawings.
- F. Hardware Sets:

Hardware Group No. 03

For use on Door #(s):

S8B S8C

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	3CB1 4.5 X 4.5 NRP		652	IVE
1	EA	STOREROOM LOCK	L9080T OMEA		626	SCH
1	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	SURFACE CLOSER	4040XP SHCUSH TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	DOUBLE SEAL	8145SBK PSA		BK	ZER
1	EA	DOOR SWEEP	253A		A	ZER
1	EA	THRESHOLD	AS REQUIRED BY THRESHOLD SILL DETAIL (INCLUDE 545A-V3-226 IF NONE SHOWN AND ASK FOR CLAIRIFICATION)		A	ZER

EXISTING FRAME TO REMAIN.
 MODIFY EXISTING FRAME AS REQUIRED FOR NEW HARDWARE
 FIELD VERIFY HINGE SIZE
 WHERE NECESSARY, PROVIDE CUSTOM STRIKE AS REQUIRED.

Hardware Group No. 03B

For use on Door #(s):

1216A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	3CB1 4.5 X 4.5 NRP		652	IVE
1	EA	STOREROOM LOCK	L9080T OMEA		626	SCH
1	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	SURFACE CLOSER	4040XP TBWMS		689	LCN
1	EA	ARMOR PLATE	8400 16" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP/HOLDER	FS40 SERIES		626	IVE
1	EA	DOUBLE FIN GASKETING	8042SBK PSA		BK	ZER

EXISTING FRAME TO REMAIN.
 MODIFY EXISTING FRAME AS REQUIRED FOR NEW HARDWARE
 FIELD VERIFY HINGE SIZE
 WHERE NECESSARY, PROVIDE CUSTOM STRIKE AS REQUIRED.

Hardware Group No. 04A

For use on Door #(s):

1213A	S1B	S2C	S3B	S4C	S6A
S7B	S9A	S10A			

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
4	EA	HINGE	3CB1HW 4.5 X 4.5		652	IVE
1	EA	CLASSROOM SECURITY	L9071T OMEA L283-711		626	SCH
2	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	SURFACE CLOSER	4040XP TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		BLK	IVE
1	EA	FLOOR STOP	FS436 OR FS438 AS REQ.		626	IVE
1	EA	GASKETING	326AA-S		AA	ZER
1	EA	DOOR SWEEP	381A		A	ZER
1	EA	THRESHOLD	AS REQUIRED BY THRESHOLD SILL DETAIL (INCLUDE 545A-V3-226 IF NONE SHOWN AND ASK FOR CLAIRIFICATION)		A	ZER

EXISTING FRAME TO REMAIN.
 MODIFY EXISTING FRAME AS REQUIRED FOR NEW HARDWARE
 FIELD VERIFY HINGE SIZE
 WHERE NECESSARY, PROVIDE CUSTOM STRIKE AS REQUIRED.

Hardware Group No. 04B

For use on Door #(s):

S5A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
4	EA	HINGE	3CB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	CLASSROOM SECURITY	L9071T OMEA L283-711		626	SCH
2	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		BLK	IVE
1	EA	FLOOR STOP	FS436 OR FS438 AS REQ.		626	IVE
1	EA	GASKETING	429AA-S		AA	ZER
1	EA	DOOR SWEEP	381A		A	ZER
1	EA	THRESHOLD	AS REQUIRED BY THRESHOLD SILL DETAIL (INCLUDE 545A-V3-226 IF NONE SHOWN AND ASK FOR CLAIRIFICATION)		A	ZER

EXISTING FRAME TO REMAIN.

MODIFY EXISTING FRAME AS REQUIRED FOR NEW HARDWARE

FIELD VERIFY HINGE SIZE

WHERE NECESSARY, PROVIDE CUSTOM STRIKE AS REQUIRED.

Hardware Group No. 08

For use on Door #(s):

1217A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	224XY		628	IVE
1	EA	PANIC HARDWARE	LD-PA-AX-XP99-NL-OP-110MD-SNB		626	VON
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
1	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	DOOR PULL	VR910 NL		630	IVE
1	EA	SURFACE CLOSER	4040XP SHCUSH TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	RAIN DRIP	142AA		AA	ZER
			(OMIT WHERE OVERHANG OCCURS)			
1	EA	DOUBLE SEAL	8145SBK PSA		BK	ZER
1	EA	DOOR SWEEP	381A		A	ZER
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	AS REQUIRED BY THRESHOLD SILL DETAIL (INCLUDE 103A-223 IF NONE SHOWN)		A	ZER

ADJUST CLOSER BACK CHECK TO HELP STOP DOOR AT 90 DEGREES

Hardware Group No. 10

For use on Door #(s):

1219A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	224XY		628	IVE
1	EA	STOREROOM LOCK	L9080T LLL OMEA L283-150		630	SCH
1	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	DOOR PULL	VR900		630	IVE
1	EA	OH STOP & HOLDER	81H		630	GLY
1	EA	RAIN DRIP	142AA		AA	ZER
			(OMIT WHERE OVERHANG OCCURS)			
1	EA	DOOR SWEEP	381A		A	ZER
1	EA	THRESHOLD	AS REQUIRED BY THRESHOLD SILL DETAIL (INCLUDE 103A-223 IF NONE SHOWN)		A	ZER
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 15

For use on Door #(s):

S1A	S2A	S3A	S4A	S5B	S5C
S8A	S8D	S9C	S10B		

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	224XY		628	IVE
1	EA	PANIC HARDWARE	CDSI-PA-AX-XP99-NL-OP-110MD-SNB		626	VON
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX XQ11-948 36-083 (@ DOGGING)		626	SCH
2	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	DOOR PULL	VR910 NL		630	IVE
1	EA	SURFACE CLOSER	4040XP SHCUSH TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	RAIN DRIP	142AA		AA	ZER
			(OMIT WHERE OVERHANG OCCURS)			
1	EA	GASKETING	429AA-S		AA	ZER
1	EA	DOOR SWEEP	381A		A	ZER
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	AS REQUIRED BY THRESHOLD SILL DETAIL (INCLUDE 103A-223 IF NONE SHOWN)		A	ZER
2	EA	VIEWER	698 (INSTALL VIEWERS AT 43" & 60" A.F.F.)		626	IVE

ADJUST CLOSER BACK CHECK TO HELP STOP DOOR AT 90 DEGREES

Hardware Group No. 15A

For use on Door #(s):

1205A	1205B	1212A	1213B	1218B	S1C
S2B	S3C	S4B	S6B	S7A	S7C
S9B	S10C				

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	224XY		628	IVE
1	EA	PANIC HARDWARE	CDSI-PA-AX-XP99-NL-OP-110MD-SNB		626	VON
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX XQ11-948 36-083 (@ DOGGING)		626	SCH
2	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	DOOR PULL	VR910 NL		630	IVE
1	EA	SURFACE CLOSER	4040XP EDA TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP/HOLDER	FS40 SERIES		626	IVE
1	EA	RAIN DRIP	142AA (OMIT WHERE OVERHANG OCCURS)		AA	ZER
1	EA	GASKETING	429AA-S		AA	ZER
1	EA	DOOR SWEEP	381A		A	ZER
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	AS REQUIRED BY THRESHOLD SILL DETAIL (INCLUDE 103A-223 IF NONE SHOWN)		A	ZER
2	EA	VIEWER	698 (INSTALL VIEWERS AT 43" & 60" A.F.F.)		626	IVE

Hardware Group No. 15-EO

For use on Door #(s):

S8E S8G

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	224XY		628	IVE
1	EA	PANIC HARDWARE	CDSI-PA-AX-XP99-EO-SNB		626	VON
1	EA	MORTISE CYLINDER	20-061 ICX XQ11-948 36-083 (@ DOGGING)		626	SCH
1	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	DOOR PULL	VR910 NL		630	IVE
1	EA	SURFACE CLOSER	4040XP EDA TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP/HOLDER	FS40 SERIES		626	IVE
1	EA	RAIN DRIP	142AA (OMIT WHERE OVERHANG OCCURS)		AA	ZER
1	EA	GASKETING	429AA-S		AA	ZER
1	EA	DOOR SWEEP	381A		A	ZER
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	AS REQUIRED BY THRESHOLD SILL DETAIL (INCLUDE 103A-223 IF NONE SHOWN)		A	ZER
2	EA	VIEWER	698 (INSTALL VIEWERS AT 43" & 60" A.F.F.)		626	IVE

Hardware Group No. 31A

For use on Door #(s):

1214A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	3CB1 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	L9080T OMEA		626	SCH
1	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	SURFACE CLOSER	4040XP TBWMS		689	LCN
1	EA	FLOOR STOP/HOLDER	FS40 SERIES		626	IVE
1	EA	DOUBLE SEAL	8145SBK PSA		BK	ZER
1	EA	DOOR SWEEP	381A		A	ZER
1	EA	THRESHOLD	AS REQUIRED BY THRESHOLD SILL DETAIL (INCLUDE 545A-V3-226 IF NONE SHOWN AND ASK FOR CLAIRIFICATION)		A	ZER

EXISTING FRAME TO REMAIN.

MODIFY EXISTING FRAME AS REQUIRED FOR NEW HARDWARE

FIELD VERIFY HINGE SIZE

WHERE NECESSARY, PROVIDE CUSTOM STRIKE AS REQUIRED.

Hardware Group No. 35

For use on Door #(s):

1215A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
4	EA	HINGE	3CB1 4.5 X 4.5		652	IVE
1	EA	CLASSROOM SECURITY	L9071T OMEA L283-711		626	SCH
2	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	SURFACE CLOSER	4040XP TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		BLK	IVE
1	EA	FLOOR STOP/HOLDER	FS40 SERIES		626	IVE
1	EA	DOUBLE FIN GASKETING	8042SBK PSA		BK	ZER

Hardware Group No. 36

For use on Door #(s):

1218A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	3CB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	FIRE EXIT HARDWARE	PA-AX-XP99-L-F-2SI-16-SNB		626	VON
2	EA	RIM CYLINDER	20-057 ICX		626	SCH
2	EA	PRIMUS CORE	20-740-XP EV29 T		626	SCH
1	EA	SURFACE CLOSER	4040XP TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS436 OR FS438 AS REQ.		626	IVE
1	EA	DOUBLE FIN GASKETING	8042SBK PSA		BK	ZER
1	EA	DOOR SWEEP	381A		A	ZER
1	EA	THRESHOLD	AS REQUIRED BY THRESHOLD SILL DETAIL (INCLUDE 545A-V3-226 IF NONE SHOWN AND ASK FOR CLAIRIFICATION)		A	ZER

EXISTING FRAME TO REMAIN.

MODIFY EXISTING FRAME AS REQUIRED FOR NEW HARDWARE

FIELD VERIFY HINGE SIZE

WHERE NECESSARY, PROVIDE CUSTOM STRIKE AS REQUIRED.

Hardware Group No. EDTR-PR

For use on Door #(s):

S8F

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
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EXISTING DOOR, FRAME & HARDWARE TO REMAIN.

ADJUST EXISTING CLOSER TO MEET 5 POUND MAX EFFORT TO OPERATION.

MISCELLANIOUS HARDWARE REQUIRED

Provide the following:

<u>QTY</u>		<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>		<u>FINISH</u>	<u>MFR</u>
12	EA	EXTRA PRIMUS CORES	20-740 XP EV29 T		606	SCH
3	EA	CONST. CONTROL	KEYS			SCH
3	EA	CONTROL	KEYS			SCH
12	EA	CONST. MASTER	KEYS			SCH
3	EA	EMERGENCY	KEYS			SCH
4	EA	"0" CUT CHANGE KEYS	PER CYLINDER OR CORE			SCH
5	EA	GRANDMASTER KEYS	PER GRANDMASTER GROUP			SCH
50	EA	EXTRA KEYBLANKS	PER KEYWAY			SCH
5	EA	MASTER KEYS	PER MASTER GROUP			SCH
1	SET	SPECIAL TOOLS	DRIVERS, WRENCHES, ETC			
1	EA	BINDER	INST/MAINT/ADJUSTMENT INFO EA ITEM			
1	EA	BINDER	CATALOG CUTS AND HARDWARE SCHEDULE FOR JOB			
1	EA	LIST OF ORIGINAL	FACTORY ORDER NUMBERS FOR WARRANTY VALIDATION			

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal doors and frames.
- B. Hollow metal frames for wood doors.
- C. Fire-rated hollow metal doors and frames.
- D. Thermally insulated hollow metal doors with frames.
- E. Hollow metal borrowed lites glazing frames.
- F. Accessories, including glazing and louvers.

1.02 RELATED REQUIREMENTS

- A. Section 08 71 00 - Door Hardware.
- B. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.
- C. Section 09 91 13 - Exterior Painting: Field painting.
- D. Section 09 91 23 - Interior Painting: Field painting.

1.03 ABBREVIATIONS AND ACRONYMS

- A. ANSI: American National Standards Institute.
- B. HMMA: Hollow Metal Manufacturers Association.
- C. NAAMM: National Association of Architectural Metal Manufacturers.
- D. NFPA: National Fire Protection Association.
- E. SDI: Steel Door Institute.
- F. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

- A. 12-7-4 CA Ref Stds - California Referenced Standards Code Chapter 12-7-4 Fire Resistive Standards.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- C. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
- D. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors.
- E. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
- F. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100).
- G. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

- H. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 1. Use 2016a as indicated in 2019 CBC Referenced Standards.
- I. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 1. Use 2015 as indicated in 2019 CBC Referenced Standards.
- J. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
- K. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- L. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - 1. Use 2004(2012) as indicated in 2019 CBC Referenced Standards.
- M. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames.
- N. ITS (DIR) - Directory of Listed Products.
- O. NAAMM HMMA 820 TN03 - Guidelines for Glazing of Hollow Metal Transoms, Sidelights and Windows.
- P. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames.
- Q. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames.
- R. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames.
- S. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames.
- T. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
 - 1. Use 2016 as indicated in 2019 CBC Referenced Standards.
- U. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives.
 - 1. Use 2016 as indicated in 2019 CBC Referenced Standards.
- V. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
 - 1. Use 2017 as indicated in 2019 CBC Referenced Standards.
- W. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames.
- X. UL (DIR) - Online Certifications Directory.
- Y. UL 10B - Standard for Fire Tests of Door Assemblies.
 - 1. Use 2008 (Revised 2015) as indicated in 2019 CBC Referenced Standards.
- Z. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies.
 - 1. Use 2009 (Revised 2015) as indicated in 2019 CBC Referenced Standards.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
 - 1. Show fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
 - 2. Provide schedule of doors and frames using same reference numbers for details and openings as those indicated on Drawings.
 - 3. Indicate coordination of glazing frames and stops with glass and glazing requirements.
- D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- E. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.
- F. Manufacturer's Qualification Statement.
- G. Installer's Qualification Statement.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
- C. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Provide packaging such as cardboard, or other containers to protect surfaces of hollow metal doors. Strap welded frames together in pairs with head of one unit inverted or provide temporary spreaders fastened to the bottom of each frame.
- B. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 - 1. Store doors and frames on platforms under cover.
 - 2. Store doors and frames in dry storage spaces, with adequate ventilation, free from dust, and which permits easy access for inspection and handling.
 - 3. Avoid using nonvented plastic or canvas shelters that create a humidity chamber.
 - 4. If the wrapper on the door becomes wet, remove the wrapper.

- C. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Fire-Rated Door Assemblies: Meet the requirements of the California Building Code (CBC), Title 24, Part 2, Chapter 7 - Fire Resistance Rated Construction for the fire resistive ratings indicated, and which are labeled by Underwriter's Laboratories, Factory Mutual, or other testing agency acceptable to the State Fire Marshal.
 - 1. Fire-rated door and frame construction: Conform to NFPA 252, applicable CBC Standard 12-7-4 CA Ref Stds and requirements of Factory Mutual System (FM). Labels on fire-rated doors and frames shall identify FM listing approval. Comply with UL 10B.
 - 2. Fire-rated door and frame installation: NFPA 80 - Fire Door Installation and applicable CBC Standards for fire rated class indicated.
 - 3. Fire-rated doors, intumescent seals: UL 10C compliant. If intumescent seals are required for the fire labeled assembly, furnish flush with door edge type seals or kerfed in frame type seals. Surface applied adhesive seals will not be accepted. Coordinate frame fabrication to allow use of kerfed in frame type seal options.
 - 4. Temperature rise rating: At exit stairwell enclosures, exit passageways, and horizontal exits, provide doors which are labeled for a maximum transmitted temperature end point not to exceed 450 degrees above ambient at the end of 30 minutes of fire exposure.
 - 5. Oversize fire-rated door assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to the State Fire Marshal that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
 - 6. Where fire resistive doors are indicated to be equipped with louvers, provide fusible link type louvers acceptable to the testing agency labeling the fire door and frame assembly.
 - a. Exception: Louvers are not to be used in "S" rated door assemblies. CBC Section 710.5.2.1 and 716.2.2.1.1.
 - 7. All exit/access doorways and other doors opening into a fire rated corridor shall be protected by tight-fitting smoke and draft control assemblies having a fire rating of not less than 20 minutes when tested in accordance with CBC Standards and shall be labeled accordingly per CBC section 716.2.2.1.

2.02 MANUFACTURERS

- A. Hollow Metal Doors and Frames:
 - 1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com.
 - 2. Curries, an Assa Abloy Group company: www.assaabloydss.com.
 - 3. Door Components Inc.; www.doorcomponents.com.
 - 4. Steelcraft, an Allegion brand: www.allegion.com/sle.

2.03 PERFORMANCE REQUIREMENTS

- A. Requirements for Hollow Metal Doors and Frames:
1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
 2. Accessibility: Comply with ADAAG 2010 and CBC Chapter 11B.
 3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
 4. Door Edge Profile: Beveled, both sides.
 5. Typical Door Face Sheets: Flush. Smooth.
 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvanized) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
 - a. Based on SDI Standards: Provide at least A40/ZF120 (galvanized) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvanized) for corrosive locations.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.04 HOLLOW METAL DOORS

- A. Door Finish: Factory primed and field finished.
- B. Exterior Doors: Thermally insulated.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 4 - Maximum-duty.
 - b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 2 - Seamless.
 - d. Door Face Metal Thickness: 14 gauge, 0.067 inch, minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 2. Core Material: Polyurethane, 1.8 lbs/cu ft minimum density.
 3. Door Thermal Resistance: U-factor of 0.70 maximum.

- a. Doors with no glazing or less than 50 percent glazed shall comply with the required U-factor not greater than the applicable value (0.70) in Subchapter Table 140.3-B, C, or D. California Energy Code Section 140.3 (a) 7.
 - 4. Door Thickness: 1-3/4 inches, nominal.
 - 5. Weatherstripping: Refer to Section 08 71 00.
 - a. Maximum Air Leakage, ASTM E283: 0.30cfm per square foot of static differential air pressure of 1.567 psf (equivalent to 25 mph wind velocity). California Energy Code Section 110.6(a) 1.
- C. Interior Doors, Non-Fire-Rated:
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 2 - Seamless.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 - e. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 - 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
 - 3. Door Thickness: 1-3/4 inches, nominal.
- D. Fire-Rated Doors:
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 2 - Seamless.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 - 2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
 - a. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - b. Attach fire rating label to each fire rated unit.
 - 3. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
 - a. Fabricate to the requirements of NFPA 252 for the hourly rates indicated.
 - 4. Door Thickness: 1-3/4 inches, nominal.

2.05 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Frame Finish: Factory primed and field finished.
 - 1. Provide compatible primer for Section 09 96 00 - High-Performance Coatings.
- C. Exterior Door Frames: Fully welded.
 - 1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvanized) in accordance with ASTM A653/A653M, with A40/ZF120 coating.

2. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
 3. Weatherstripping: Separate, see Section 08 71 00.
- D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
1. Frame Metal Thickness: 18 gage, 0.042 inch, minimum.
- E. Door Frames, Fire-Rated: Full profile/continuously welded type.
1. Fire Rating: Same as door, labeled.
 2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
- F. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.
- G. Mullions for Pairs of Doors: Fixed, except where removable is indicated, with profile similar to jambs.
- H. Frames for Interior Glazing, Borrowed Lights, Sidelights, and Exterior Windows: Construction and face dimensions to match door frames, and as indicated on drawings.
1. Full formed, concealed fastenings, welded corners, fabricated as for door frames.
 2. Shapes as detailed and scheduled on Drawings.
 3. Provide single rabbet frames at all Interior Glazing, Borrowed Lights, Sidelights, and Exterior Windows.
 4. Cold rolled steel with anchors same as for door frames for respective wall condition.
 - a. Exception:
 - 1) Jamb anchors located within 6 inches of head and sill plus spaced not more than 24 inches on center.
 - 2) Head and sill anchors located within 6 inches of jambs plus spaced not more than 24 inches on center.
- I. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

2.06 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
1. Exterior Steel Doors and Door Frames: Comply with requirements for primer for finish coats.
 2. Interior Steel Doors and Rolled Steel Door Frames: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints.
- B. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.
- D. Field Applied Finish Painting: As specified in:
1. Section 09 91 13 - Exterior Painting.
 2. Section 09 91 23 - Interior Painting.

3. Exterior Doors (Abuse Resistant): Section 09 96 00 - High-Performance Coatings.

2.07 ACCESSORIES

- A. Louvers: Roll formed steel with overlapping frame; finish same as door components; factory-installed.
 1. In Fire-Rated Doors: UL (DIR) or ITS (DIR) listed fusible link louver, same rating as door.
 2. Style: Sightproof inverted Y blade.
 - a. Fixed: Where indicated, provide fixed louvers consisting of inverted blades, formed of not lighter than 18 gage steel, welded or tenoned to 18 gage steel frames. Form louvers of same material specified for stiles and rails.
 3. Size: 20 x 12 inch
 4. Moldings:
 - a. Not lighter than 18 gage galvanized steel moldings, or 18 gage hot or cold rolled steel moldings.
 - b. Moldings shall be nonremovable on exterior or corridor side of door.
 - c. Form moldings for exterior doors of hot dip galvanized steel.
 5. Fasteners: Exposed, tamper proof fasteners.
 6. Insect Screens: Provide with 18 by 14 mesh bronze insect screen fabric in a zinc coated steel, rewireable frame finished to match the door.
- B. Glazing: As specified in Section 08 80 00, factory installed.
 1. Glazed Openings: Comply with CBC Section 716.3.2.1.2 and Chapter 24.
 - a. Vision Panel: Factory installed.
 - 1) Application: Provide at all new classroom, office, corridor and other teacher and staff occupied spaces.
 - 2) Size (WxH): 6 by 37 inches, unless indicated otherwise on Drawings.
- C. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
 1. Glazing Stops: Channel glazing stops, completely fit ready for removal and glazing at site.
 2. Place on exterior side with tamper proof screws.
- D. Astragals for Double Doors: Specified in Section 08 71 00.
- E. Supports and Anchors: Fabricate of not less than 16 gage sheet steel; galvanized where used with galvanized frames or at exterior, damp or wet locations.
 1. Anchors: Provide in accordance with ANSI/SDI A250.11.
 - a. Anchors at fire rated frames shall also conform to UL 10B.
 - b. Provide one floor anchor and the number of wall anchors listed below welded into each jamb member.
 - 1) Number of anchors at:
 - (a) Concrete or Masonry: Typically 3, and 4 for doors over 7'-0" high.
 - (b) Steel Stud Partitions: Typically 4, and 5 for doors over 7'-0" high.
 - c. Wall anchors shall be of type indicated for the specific wall condition and of same material specified for frames.

- d. Provide head anchors welded into head member as recommended by the frame manufacturer.
 - e. All anchors shall be 16 gage minimum for galvanized frames and 16 gage minimum for cold or hot rolled steel frames.
 - f. Provide "Z" spacer type anchors for all wood studs.
2. Punch and dimple jambs within 6 inches of bottom for attachment to concrete stem walls where occur.
- F. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
- 1. Omit silencers where head and jamb bulb-type weatherstripping or sound seals are to be installed and omit where in violation of fire rating. Silencers are specified in Section 08 71 00 - Door Hardware.
- G. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.
- H. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A153/A153M, Class C or D as applicable.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. In addition, install fire rated units in accordance with NFPA 80 and their listing.
 - 1. Provide clearances as specified in NFPA 80, NFPA 105, and as required by California Building Code (CBC).
- C. Coordinate frame anchor placement with wall construction.
- D. Install door hardware as specified in Section 08 71 00.
 - 1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
- E. Coordinate installation of electrical connections to electrical hardware items.
- F. Welded Steel Frames Installation:
 - 1. Install frame solid in the wall, plumb and square, with proper opening width and height.
 - a. Dry-pack void when frame set in place.

2. Fasten clip angles to floor construction and brace frames so as to retain their position and clearance during construction of adjacent Work. Attach structural overhead bracing securely to structure above, as required.
 3. Install anchors for connection to concrete/masonry at each jamb (minimum 3 per jamb).
 4. Install anchors for stud partitions on hinge jamb immediately above each hinge reinforcing plate and below the top hinge reinforcement (minimum 4 per jamb) and locate anchors directly opposite on the strike jamb.
 5. Comply with requirements for fire-rated assembly, including filling frame with solid portland cement grout or firestopping material, as detailed.
- G. Doors Installation, General: Hang doors and adjust for proper clearances and operation. Refer to Section 08 71 00 - Door Hardware for hardware requirements.
 - H. For waterproofing of hollow metal window frames, follow NAAMM HMMA 820 TN03.
 - I. Touch up damaged factory finishes.

3.04 REPAIRS:

- A. Make repairs only if permitted by Architect. Otherwise, replace damaged components.
- B. Fill surface depressions with metallic paste filler, allow to thoroughly cure, sand flush, and smooth for an invisible appearance with adjacent metal surfaces.
- C. Sand smooth all rusted areas.
- D. Repair galvanized surfaces with specified repair compound.
- E. Apply touch-up paint using air drying primer compatible with shop-applied finish.

3.05 TOLERANCES

- A. Flush Steel Door Installation Tolerances: Fit hollow metal doors accurately in frames, within clearances specified in ANSI/SDI A250.8.
- B. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- C. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.06 ADJUSTING

- A. Adjust for smooth and balanced door movement.
- B. Test sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

3.07 CLEANING AND PROTECTION

- A. Prime Coat Touch-up: Immediately after installation, sand smooth all corroded (rusted), damaged and deteriorated areas of prime coat and apply touch-up coat of compatible air-drying primer.
- B. Protection: Protect installed frames and doors from damage.
 1. Provide protective coverings and other devices as necessary, in conformance to requirements specified in Section 01 50 00 - Temporary Facilities and Controls.

2. Remove protective devices from prefinished components for Substantial Completion review.
- C. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.
- D. Cleaning: Clean doors and frames of surface contaminants detrimental to proper application of field-applied finishes.

3.08 SCHEDULE - SEE DRAWINGS

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Flush wood doors; flush configuration; non-rated.

1.02 RELATED REQUIREMENTS

- A. Section 08 11 13 - Hollow Metal Doors and Frames.
- B. Section 08 71 00 - Door Hardware.
- C. Section 08 80 00 - Glazing.
- D. Section 09 91 23 - Interior Painting: Field finishing of doors.

1.03 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards.
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1.
- C. NEMA LD 3 - High-Pressure Decorative Laminates.
- D. WDMA I.S. 1A - Interior Architectural Wood Flush Doors.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
 - 1. Provide information as required by AWMAC/WI (NAAWS).
 - 2. Include certification program label.
- D. Samples: Submit two samples of door veneer, 12 by 12 inches in size illustrating wood grain, stain color, and sheen.
- E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- F. Test Reports: Show compliance with specified requirements for the following:
 - 1. Sound-retardant doors and frames; sealed panel tests are not acceptable.
- G. Manufacturer's Installation Instructions: Indicate special installation instructions.
- H. Specimen warranty.
- I. Warranty, executed in District's name.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
 - 1. Company with at least one project within past five years with value of woodwork within at least 20 percent of cost of woodwork for this project.
 - 2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- C. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.
- D. Quality Certification:
 - 1. Provide labels or certificates indicating that installed work will comply with AWMAC/WI (NAAWS) requirements for grade or grades specified.
 - 2. Provide designated labels on shop drawings as required by certification program.
 - 3. Provide designated labels on installed products as required by certification program.
 - 4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, and inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Veneer Faced Doors:
 - 1. Buell Door Co.: www.eggersonindustries.com.
 - 2. Haley Brothers: www.haleybros.com/#sle.
 - 3. Masonite Architectural: www.architectural.masonite.com/#sle.
 - 4. Oregon Door: www.oregondoor.com.

5. VT Industries, Inc: www.vtindustries.com/#sle.
6. VT Industries, Inc: www.vtindustries.com.
7. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOORS

- A. Doors: See drawings for locations and additional requirements.
 1. Quality Standard: Custom Grade, Extra Heavy Duty performance, in accordance with AWMAC/WI (NAAWS) or WDMA I.S. 1A.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
 1. Provide solid core doors at each location.
 2. High pressure decorative laminate (HPDL) finish as indicated on drawings, to match existing and casework.

2.03 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type staved lumber core (SLC), plies and faces as indicated.

2.04 DOOR FACINGS

- A. High Pressure Decorative Laminate (HPDL) Facing for Fire Doors: NEMA LD 3, SGF; color as selected; textured, low gloss finish.
- B. High Pressure Decorative Laminate (HPDL) Facing for Non-Fire-Rated Doors: NEMA LD 3, HGS; color as selected; textured, low gloss finish.
- C. Facing Adhesive: Type II - water resistant.

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
 1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
- C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- F. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

- A. Factory finish doors in accordance with approved sample.
- B. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

- A. Hollow Metal Door Frames: See Section 08 11 13.

- B. Door Hardware: See Section 08 71 00.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Field-Finished Doors: Trimming to fit is acceptable.
 - 1. Adjust width of non-rated doors by cutting equally on both jamb edges.
 - 2. Trim maximum of 3/4 inch off bottom edges.
- D. Use machine tools to cut or drill for hardware.
- E. Coordinate installation of doors with installation of frames and hardware.
- F. Coordinate installation of glazing.

3.03 TOLERANCES

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

3.05 SCHEDULE - SEE DRAWINGS

END OF SECTION

SECTION 08 31 00
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall and ceiling mounted access units.
- B. Floor mounted access door and frame units, interior and exterior.
- C. Sliding monorail access door and frame units.
- D. Flood protection door and frame units.
- E. Flood protection plank and frame units.

1.02 RELATED REQUIREMENTS

- A. Section 09 21 16 - Gypsum Board Assemblies: Openings in partitions.
- B. Section 09 21 16 - Gypsum Board Assemblies: Openings in ceilings.
- C. Section 09 30 00 - Tiling: Tile finishes on and around openings.
- D. Section 09 91 13 - Exterior Painting: Field paint finish.
- E. Section 09 91 23 - Interior Painting: Field paint finish.
- F. Divisions 11, 12, 13, and 14: Miscellaneous components requiring access.
- G. Divisions 21, 22, 23, 26, 27, and 28: Mechanical and Electrical components requiring access.
 - 1. Access doors in ductwork.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- B. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- C. ASTM A513/A513M - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
- D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
- E. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- F. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings.
- G. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- H. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
- I. FM (AG) - FM Approval Guide.
- J. ITS (DIR) - Directory of Listed Products.

- K. UL (FRD) - Fire Resistance Directory.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
 - 1. If other than specified products by specified manufacturer, submit product data for each type of access door to be used. Include schedule of access door types, sizes and locations.
- C. Shop Drawings: Indicate exact position of each access door and/or panel unit.
 - 1. For access doors other than shown on Drawings, submit marked floor plan giving locations of all access doors. Submit shop drawing for Architect's review before laying out utility services which require access doors.
- D. Manufacturer's Installation Instructions: Indicate installation requirements.
- E. Manufacturer's Qualification Statement.
- F. Project Record Documents: Record actual locations of each access unit.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.06 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain access doors for entire project from one source from a single manufacturer.
- B. Regulation Requirements: Fire rated access doors shall conform to California Building Code (CBC) Title 24, Part 2, Chapter 7. Panels shall bear the label of Underwriters Laboratories or other testing agency acceptable to the State Fire Marshal.
- C. Fire-Resistance Ratings: Wherever a fire-resistance classification is indicated, provide access door assembly for rating shown, with flush door, frame, hinge, and latch from manufacturer listed in UL - Building Materials Directory. Provide UL label on each fire-rated access door.
- D. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.
- E. Coordination: Furnish inserts and anchoring devices for building into adjoining Work for installation of access doors.

1.07 PROJECT CONDITIONS

- A. Verification: Obtain specific locations and sizes for required access doors for Work specified in Plumbing, Mechanical, Electrical or other Sections, for access to concealed equipment, and indicate on submitted schedule.
- B. Special-Size Access Doors: Sizes up to 20-inches by 30-inches used where necessary or as indicated. Indicate special size access doors on submitted schedule.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS

- A. Access Door Materials and Fabrication, General: Provide each access door assembly manufactured as an integral unit, complete with all parts, and ready for installation.
 - 1. If size is not indicated, provide size as directed to adequately access concealed operable mechanisms.
- B. Units in Fire Rated Assemblies: Fire rating equivalent to the fire rated assembly in which they are to be installed.
 - 1. Provide products listed and labeled by UL or ITS (Warnock Hersey) as suitable for the purpose specified and indicated.

2.02 ACCESS DOORS AND PANELS ASSEMBLIES

- A. Wall-Mounted Units with Return Air Grille:
 - 1. Location: As indicated on drawings.
 - 2. Panel Material: Aluminum extrusions with gypsum board inlay.
 - 3. Size: 12 by 12 inches, nominal minimum.
 - 4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 - 5. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
 - 6. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
- B. Wall-Mounted Units in Wet Areas:
 - 1. Location: As indicated on drawings.
 - 2. Panel Material: Stainless steel, Type 304.
 - 3. Size: 12 by 12 inches, nominal minimum.
 - 4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 - 5. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
 - 6. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
- C. Fire-Rated Wall-Mounted Units:
 - 1. Location: As indicated on drawings.
 - 2. Wall Fire-Rating: As indicated on drawings.
 - 3. Panel Material: Steel.
 - 4. Size: 12 by 12 inches, nominal minimum.

5. Door/Panel: Insulated double-surface panel, with tool-operated spring or cam lock and no handle.
- D. Ceiling-Mounted Units with Return Air Grille:
1. Panel Material: Aluminum extrusion with gypsum board inlay.
 2. Size - Lay-In Grid Ceilings: To match module of ceiling grid.
 3. Size - Other Ceilings: 12 inch by 12 inch, nominal minimum.
 - a. Maximum 300 square inches per DSA IR 25.3.13 in suspended gypsum board ceilings.
 4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 5. Ceiling Doors and Panels: Open with allen wrench - no keys.
 6. Ceiling Doors and Panels: Include a retention spring or bar to keep door from falling open rapidly.

2.03 WALL AND CEILING MOUNTED ACCESS UNITS

- A. Manufacturers:
1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
 2. ACUDOR Products Inc: www.acudor.com/#sle.
 3. Babcock-Davis: www.babcockdavis.com.
 4. Cendrex, Inc: www.cendrex.com/#sle.
 5. Larsen's Manufacturing Co.: www.larsensmfg.com.
 6. Karp Associates, Inc: www.karpinc.com.
 7. Milcor, Inc: www.milcorinc.com.
 8. Nystrom, Inc: www.nystrom.com.
 9. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Wall and Ceiling Mounted Units: Factory fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
1. Style: Exposed frame with door surface flush with frame surface.
 - a. Gypsum Board Mounting Criteria: Use drywall bead type frame.
 - b. Plaster Mounting Criteria: Use plaster bead type frame.
 2. Door Style: Single thickness with rolled or turned in edges.
 3. Frames: 16 gauge, 0.0598 inch, minimum thickness.
 4. Heavy Duty Frames: 14 gauge, 0.0747 inch, minimum thickness.
 5. Heavy Duty Single Steel Sheet Door Panels: 14 gauge, 0.0747 inch, minimum thickness.
 6. Door Panels to Receive Wall/Ceiling Finish: Surface recessed 5/8 inch back from wall face.
 - a. For recess-mounted access doors, provide access sleeves for each locking device.
 - b. Provide plastic grommets for installation in holes cut through finish.

- c. Provide recess-mounted doors for concealed installation in:
 - 1) Acoustic tile ceiling systems, where indicated.
 - 2) Acoustical tile-finished gypsum board ceilings, where indicated.
 - 3) Gypsum board walls, where indicated.
 - 4) Ceramic tile walls, where indicated.
 - 7. Insulation: Non-combustible mineral wool or glass fiber.
- C. Units in Fire-Rated Assemblies: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.
 - 1. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.
 - 2. Provide certificate of compliance from authorities having jurisdiction indicating approval of fire rated doors.
 - 3. Primed and Factory Finish: Polyester powder coat; color as selected by Architect from manufacturer's standard colors.
 - 4. Door/Panel Size: As indicated on the drawings.
 - 5. Hardware:
 - a. Hardware for Fire-Rated Units: As required for listing.
 - b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
 - c. Latch/Lock: Screw driver slot for quarter turn cam latch.
 - d. Gasketing: Extruded neoprene, around perimeter of door panel.
- D. Provide recess-mounted doors and frames with expanded metal lath for concealed installation in plaster.
- E. DSA IR 25.3-13 Provide at suspended gypsum board ceiling, a permanently attached warning label stating:
 - 1. "Warning:
 - a. Do not climb, walk, or crawl on the gypsum board ceiling panels or metal framing.
 - b. Do not store or stow anything on the gypsum board ceiling panels or metal framing."

2.04 WALL MOUNTED ACCESS UNITS WITH RETURN AIR GRILLES

- A. Gypsum Board Inlay Access Panels: Provide rectangular and square access panel with recessed and gasketed aluminum perimeter frame that acts as finishing edge and having concealed mechanical touch-latch with safety cable and free-pivoting hinge.
 - 1. Rectangular Panel Frame Size: 24 by 36 inches set within 1/2 inch thick gypsum board.
 - 2. Square Panel Frame Size: 24 by 24 inches set within 1/2 inch thick gypsum board.
 - 3. Panel Frame: 1 inch margin with concealed countersunk screw mounting.
- B. Air Return Grille: Linear bar grille fitted with flush and concealed perimeter frame.
 - 1. Grille: Fixed grilles with 1/4 inch thick by 5/8 inch deep bars at 1/2 inch on center providing 48 percent free space opening.
 - 2. Grille Size: 12 by 12 inches set within 1/2 inch thick gypsum board.
 - 3. Fabrication: Aluminum with factory powder coated finish.
 - 4. Grille Frame: 1 inch margin with concealed countersunk screw mounting.

2.05 FLOOR MOUNTED ACCESS UNITS

- A. Manufacturers:
 - 1. BILCO Company; Type J - Channel Frame, steel: www.bilco.com/#sle.
- B. Floor Mounted Access Units: Factory fabricated, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
 - 1. Size: As indicated on drawings.
 - 2. Hardware: Steel, hot-dipped galvanized.
 - a. Hinges: Removable pin.
- C. Exterior Floor Mounted Access Units: Steel, minimum 1/4 inch thick.
 - 1. Design Load: Design to support live load of 300 psf with deflection not to exceed 1/180 of span.
 - 2. Operation: Manual opening, and manual closing.
 - 3. Cover Pattern: Diamond tread plate, with custom lettering.
 - 4. Lift Handle: Removable.
 - 5. Finish: Rust inhibiting primer.
 - 6. Finish: Mill finish.

2.06 SLIDING MONORAIL OPENING ACCESS UNITS

- A. Sliding Monorail Opening Access Units: Factory fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; unitized structural track and frame assembly; coordinate requirements with type of installation assembly being used for each unit.
 - 1. Material: Stainless steel, 16 gauge, 0.06 inch minimum thickness.
 - 2. Door Size: As indicated on drawings.
 - 3. Door Type: Bi-parting sliding doors, with insulated double wall construction.
 - 4. Sliding doors to operate on high capacity, spark-less, non-corrosive type rollers with greasable bearings and seals.
 - 5. Door Hardware: Provide manufacturer's standard hardware for application indicated with weather-sealed perimeter and latching joint.
 - 6. Busbar and Monorail Notch: Sized to allow doors to close and fully seal around monorail beam upon closing.

2.07 FLOOD PROTECTION DOORS

- A. Flood Protection Doors: Provide FM (AG) approved barriers against short-term high water levels with factory fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly indicated for each unit.
 - 1. Door Type: Single swing flood door.
 - 2. Flood Door Material:

- a. Steel: Structural or formed steel shapes and bars, ASTM A36/A36M; structural tubing, ASTM A500/A500M Grade B, or mechanical tubing, ASTM A513/A513M; of appropriate size and strength with welded construction.
- 3. Panel Sheeting Material:
 - a. Steel: ASTM A36/A36M, ASTM A1008/A1008M, and ASTM A1011/A1011M welded in place.
 - 1) Finish: One primer and two finish shop coats, applied in accordance with manufacturer's instructions.
- 4. Frame Material: Provide jamb, head, and sill framing members designed and fabricated with fasteners, sealant, and water stop as required for loading and application indicated.
 - a. Steel: Structural or formed steel shapes, ASTM A36/A36M; of appropriate size and strength with welded construction.
 - 1) Finish: One primer and two finish shop coats, applied in accordance with manufacturer's instructions.
- 5. Threshold: ASTM B26/B26M sand cast aluminum with alloy 6063 and temper T5, raised sill.
- 6. Door Hardware: Provide manufacturer's standard hardware, factory located and prepared, for application indicated with water-sealed perimeter and latching hardware.
- 7. Labeling: Provide labeling on flood protection doors to identify door and frame for matched installation.

2.08 FLOOD PROTECTION PLANKS

- A. Flood Protection Planks: Factory fabricated flood plank, face frame and gasket system tested to meet FM (AG) flood mitigation product approval standards; coordinate requirements with type of installation assembly indicated for each unit.
 - 1. High Water Protection Level: As indicated on drawings.
 - 2. Operation: Provide latching from single side only, as indicated on drawings.
 - 3. Mounting: Face-mounted as indicated on drawings.
 - 4. Frame: Provide mechanically anchored type frame system, and include fasteners, water-stop, and sealants as required for transfer of hydrostatic pressure and other loading of specified system.
 - 5. Loading Direction: Positive pressure loading against planks to compress seals, seated type.
 - 6. Plank Material: ASTM B209 (ASTM B209M) aluminum with alloy 6061 and temper T6, with welds ground smooth.
 - a. Finish: Mill, factory acid washed, neutralized and rinsed.
 - 7. Sill Option: Surface-mounted Type 304 stainless steel plate sill.
 - 8. Gaskets: Provide factory-mounted, ultraviolet resistant EPDM, and field replaceable compressible gaskets on flood protection planks assembly; gaskets shall not be inflatable type.
 - 9. Door Hardware: Provide manufacturer's standard hardware, factory located and prepared, for application indicated with water-sealed jambs and sill.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings are correctly sized and located.
- B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to proceeding with this work.
- B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION

- A. Install units in accordance with manufacturer's instructions, in compliance with requirements of listing authority..
- B. Install frames plumb and level in openings, and secure units rigidly in place.
- C. Provide for correct termination of adjoining finish materials.
- D. Position units to provide convenient access to concealed equipment when necessary.

3.04 ADJUST AND CLEAN

- A. Adjust access doors and hardware after installation for proper and smooth operation.
- B. Remove and replace panels or frames that are warped, bowed, or otherwise damaged.
- C. Remove protective coverings and clean stainless steel access doors during cleaning for Substantial Completion Review.

END OF SECTION

SECTION 08 71 00
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hardware for wood and hollow metal doors.
- B. Lock cylinders for doors that hardware is specified in other sections.
- C. Thresholds.
- D. Weatherstripping and gasketing.
- E. Replacement hardware for existing doors.

1.02 RELATED REQUIREMENTS

- A. Section 06 41 00 - Architectural Wood Casework: Cabinet hardware.
- B. Section 07 92 00 - Joint Sealants: Sealants for setting exterior door thresholds.
- C. Section 08 06 71 - Door Hardware Schedule: Schedule of door hardware sets.
- D. Section 08 11 13 - Hollow Metal Doors and Frames.
- E. Section 08 14 16 - Flush Wood Doors.
- F. Section 10 14 00 - Signage: Additional signage requirements.

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. BHMA (CPD) - Certified Products Directory.
- C. BHMA A156.1 - American National Standard for Butts and Hinges.
- D. BHMA A156.3 - American National Standard for Exit Devices.
- E. BHMA A156.4 - American National Standard for Door Controls - Closers.
- F. BHMA A156.5 - American National Standard for Cylinders and Input Devices for Locks.
- G. BHMA A156.6 - American National Standard for Architectural Door Trim.
- H. BHMA A156.7 - American National Standard for Template Hinge Dimensions.
- I. BHMA A156.13 - American National Standard for Mortise Locks & Latches Series 1000.
- J. BHMA A156.16 - American National Standard for Auxiliary Hardware.
- K. BHMA A156.17 - American National Standard for Self Closing Hinges & Pivots.
- L. BHMA A156.20 - American National Standard for Strap and Tee Hinges, and Hasps.
- M. BHMA A156.21 - American National Standard for Thresholds.
- N. BHMA A156.22 - American National Standard for Door Gasketing and Edge Seal Systems Sponsor.
- O. BHMA A156.26 - American National Standard for Continuous Hinges.
- P. BHMA A156.28 - American National Standard for Recommended Practices for Mechanical Keying Systems.

- Q. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames.
- R. BHMA A156.115W - American National Standard for Hardware Preparation in Wood Doors with Wood or Steel Frames.
- S. DHI (H&S) - Sequence and Format for the Hardware Schedule.
- T. DHI (KSN) - Keying Systems and Nomenclature.
- U. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.
- V. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors.
- W. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
- X. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives.
- Y. UL (DIR) - Online Certifications Directory.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- C. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; attendance is required by affected installers and the following:
 - 1. Architect.
 - 2. Installer's Architectural Hardware Consultant (AHC).
 - 3. Hardware Installer.
 - 4. Owner's Security Consultant.
- D. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- E. Keying Requirements Meeting:
 - 1. Schedule meeting at project site prior to Contractor occupancy.
 - 2. Attendance Required:
 - a. Contractor.
 - b. District and relevant staff.
 - c. Architect.
 - d. Installer's Architectural Hardware Consultant (AHC).
 - e. Hardware Installer.
 - 3. Agenda:
 - a. Establish keying requirements.
 - b. Verify locksets and locking hardware are functionally correct for project requirements.
 - c. Verify that keying and programming complies with project requirements.
 - d. Establish keying submittal schedule and update requirements.

4. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
 - a. Access control requirements.
 - b. Key control system requirements.
 - c. Schematic diagram of preliminary key system.
5. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, District, participants, and those affected by decisions made.
 - a. Furnish District's written approval of the system; do not order keys or cylinders without written confirmation of actual requirements from the District.
6. Deliver established keying requirements to manufacturers.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Prior to submittal, carefully inspect existing conditions to verify finish hardware required to complete Work, including sizes, quantities, existing hardware scheduled for re-use, and sill condition material. If conflict between the specified/scheduled hardware and existing conditions, submit request for direction from Architect. Include date of jobsite visit in the submittal.
 1. Submittals prepared without thorough jobsite visit by qualified hardware expert may be rejected as non-compliant.
- C. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- D. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
 1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
 2. Comply with DHI (H&S) using door numbers and hardware set numbers as indicated in construction documents.
 - a. Submit in vertical format, refer to Section 08 06 71.
 3. List groups and suffixes in proper sequence.
 4. Provide complete description for each door listed.
 5. Provide manufacturer's and product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
 6. Include account of abbreviations and symbols used in schedule.
- E. Samples for Verification:
 1. Submit minimum size of 2 by 4 inch for sheet samples, and minimum length of 4 inch for other products.
 2. Submit one (1) sample of hinge, latchset, lockset, and closer illustrating style, color, and finish.
 3. Return full-size samples to be incorporated into this Work.

4. Submit product description with samples.
- F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- G. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
 1. Submit manufacturer's parts lists and templates.
 2. Bitting List: List of combinations as furnished.
- H. Keying Schedule:
 1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.
- I. Installer's Qualification Statement.
- J. Supplier's Qualification Statement.
- K. District Responsibilities for submittal review:
 1. Complete keying schedule.
 2. Complete keying legend.
 3. Provide original letter of authorization allowing hardware supplier to purchase keying hardware and to have the bitting list sent to District.
 4. Provide District the locksmith's name, address, phone number and email.
 5. Identify how doors are to be keyed.
 6. For existing systems, provide the registry number.
- L. Manufacturers' certificates that fire-rated hardware meets or exceeds specified requirements.
- M. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in District's name and registered with manufacturer.
- N. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- O. Maintenance Materials and Tools: Furnish the following for District's use in maintenance of project.
 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 2. Lock Cylinders: Ten for each master keyed group.
 3. Temporary Cores: Return to and receipt by Contractor.
 4. Tools: Two sets of each special wrench or tool applicable for each different or special hardware component, whether supplied by hardware component manufacturer or not.

1.06 QUALITY ASSURANCE

- A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

- C. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.
- D. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC) to assist in work of this section.

1.07 REGULATORY REQUIREMENTS

- A. Comply with State Fire Marshal Standard 12-10-3 Exits, Section 12-10-302.
 - 1. The cross-bar shall extend across not less than one-half the width of the door/gate.
 - 2. The ends of the cross-bar shall be curved, guarded or otherwise designed to prevent catching on the clothing of persons during egress.
- B. Conform to applicable requirements of the CBC Chapter 11B and ADA Standards regarding accessibility requirements for door and entrance hardware including gates.
 - 1. Doors/doorways as part of an accessible route shall comply with CBC Sections 11B-404.
 - 2. Doors shall meet California Building Code Sections 11B-206.5, 11b-404.1 and 1010.1.
 - 3. The clear opening width for a door shall be 32 inches minimum. CBC Section 11B-404.2.3
 - a. For a swinging door it shall be measured between the face of the door and the stop, with the door open 90 degrees.
 - b. There shall be no projections into it below 34 inches and 4 inches maximum projections into it between 34 inches and 80 inches above the finish floor or ground.
 - c. Door closers and stops shall be permitted to be 78 inches minimum above the finish floor or ground.
 - d. Exception: Doors not requiring full passage through the opening, that is, to spaces less than 24 inches in depth, may have the clear opening width reduced to 20 inches. Example: shallow closets.
 - 4. Handles, pulls, latches, locks, and other operable parts on accessible doors shall comply with CBC Section 11B-309.4 and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.
 - a. Operable parts of such hardware shall be 34 inches minimum and 44 inches maximum above finish floor or ground.
 - b. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both side. CBC Section 11B-404.2.7
 - 5. The force for pushing or pulling open a door shall be as follows : CBC Section 11B-404.2.9.
 - a. Interior Hinged Doors, sliding or folding doors, and exterior hinged doors: 5 lbs maximum.
 - b. Required Fire Doors: the maximum opening force allowable by the DSA authority, not to exceed 15 lbs..
 - c. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.
 - d. The force required to activate any operable parts, such as retracting latch bolts or disengaging other devices, shall be 5 lbs. maximum to comply with CBC Section 11B-309.4.
 - 6. Door closing speed shall be as follows: CBC Section 11B-404.2.8

- a. Closer shall be adjusted so that the required time to move a door from an open position of 90 degrees to a position of 12 degrees from the latch is 5 seconds minimum.
 - b. Spring hinges shall be adjusted so that the required time to move a door from an open position of 70 degrees to the closed position is 1.5 seconds minimum.
- 7. Thresholds shall comply with CBC Section 11B-404.2.5.
- 8. Floor stops shall not be located in the path of travel and 4 inches maximum from walls.
- 9. Pair of doors: Limit swing of one leaf to 90 degrees so that a clear floor space is provided beyond the arc of the swing for the wall-mounted tactile sign. CBC Section 11B-703.4.2.1
- C. Door and door hardware encroachment: when door is swung fully-open into means-of-egress path, the door, including the hardware, may not encroach or project more than 7 inches into the required exit width. California Building Code 1005.7.1.
- D. SB 211 - DSA Bulletin 11-05
 - 1. Provide all latching devices that are lockable (including but not limited to door locks and panic/exit devices) that comply with CBC 1010.1.11:
 - a. All new construction projects to include locks that allow the doors to be locked from the inside.
 - b. The requirement applies to classrooms and any other room with an occupancy of 5 or more persons, but does not include doors that are locked from the outside at all times or student restrooms.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.09 PROJECT CONDITIONS AND COORDINATION:

- A. Where exact types of hardware specified are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical the same operation and quality as type specified, subject to Architect's approval.
- B. Coordination:
 - 1. Coordinate hardware with other work.
 - 2. Provide hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.
 - 3. Furnish related trades with the following information:
 - a. Location of embedded and attached items to concrete.
 - b. Location of wall-mounted hardware, including wall stops.
 - c. Location of finish floor materials and floor-mounted hardware.
 - d. Coordinate: flush top rails of doors at outswinging exteriors, and throughout where adhesive-mounted seals occur.
 - e. Manufacturers' templates to door and frame fabricators.

- C. Check Shop Drawings for doors and entrances to confirm that adequate provisions will be made for proper hardware installation.

1.10 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion.
 - 1. Closers: Five years, minimum.
 - a. Mechanical thirty year year for door closers.
 - b. Electrical two year year for door closers.
 - 2. Exit Devices: Three years, minimum.
 - 3. Locksets and Cylinders: Three years, minimum.
 - a. Seven years for extra heavy-duty cylindrical lock.
 - 4. Other Hardware: Two years, minimum.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide individual items of single type, of same model, and by same manufacturer.
- C. Provide door hardware products that comply with the following requirements:
 - 1. Applicable provisions of federal, state, and local codes.
 - 2. Accessibility: ADA Standards, CBC Chapter 11B.
 - 3. Listed and certified compliant with specified standards by BHMA (CPD).
 - 4. Auxiliary Hardware: BHMA A156.16.
 - 5. Straps and Tee Hinges: BHMA A156.20.
 - 6. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
 - 7. Hardware Preparation for Wood Doors with Wood or Steel Frames: BHMA A156.115W.
- D. Lock Function: Provide lock and latch function numbers and descriptions of manufacturer's series. Refer to Section 08 06 71 for listing of hardware sets.
 - 1. Exit Doors: Openable at all times from the inside without the use of a key or any special knowledge or effort.
- E. Fasteners:
 - 1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
 - a. Aluminum fasteners are not permitted.
 - b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.

2. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
 - a. Self-drilling (Tek) type screws are not permitted.
3. Provide stainless steel machine screws and lead expansion shields for concrete and masonry substrates.
4. Coordinate With Doors: Ensure provision of proper blocking to support wood screws at wood doors and machine screws at metal doors/frames to mounting panic hardware and door closers.
5. No through-bolts are allowed on any door type.
6. Concealed Fasteners: Do not use through or sex bolt type fasteners on door panel sides indicated as concealed fastener locations, unless otherwise indicated.

2.02 HINGES

- A. Hinges: Comply with BHMA A156.1, Grade 1.
 1. Self Closing Hinges: Comply with BHMA A156.17.
 2. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
 - a. Provide hinge width required to clear surrounding trim.
 - b. Drawings typically depict doors at 90 degrees, doors will actually swing to maximum allowable.
 - 1) Use wide-throw conventional or continuous hinges as needed up to 8 inches in width to allow door to stand parallel to wall for true 180-degree opening.
 - 2) Advise Architect if 8 inch width is insufficient.
 - c. Conform to manufacturer's published hinge selection standard for door dimensions, weight and frequency, and to hinge selection as scheduled.
 - 1) Where manufacturer's standard exceeds the scheduled product, furnish the heavier of the two choices, notify Architect of deviation from scheduled hardware.
 - d. Conventional Hinges: Steel or stainless steel pins and concealed bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing.
 3. Continuous Hinges: Comply with BHMA A156.26.
 4. Provide hinges on every swinging door.
 5. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
 6. Provide ball-bearing hinges at each door with closer.
 7. Provide non-removable pins on exterior outswinging doors.
 - a. Out-swinging exterior doors: Non-ferrous with non-removable (NRP) pins and security studs.
 - b. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.
 8. Provide non-removable pins on interior outswinging doors at locations as indicated in Door Hardware Schedule.
 9. Provide power transfer hinges where electrified hardware is mounted in door leaf.
 10. Provide following quantity of butt hinges for each door:

- a. Doors up to 60 inches High: Two hinges.
- b. Doors From 60 inches High up to 90 inches High: Three hinges.
- c. Doors 90 inches High up to 120 inches High: Four hinges.

2.03 EXIT DEVICES

- A. Comply with SB 211 (DSA Bulletin 11-05); CBC section 1010.1.11.
- B. Exit Devices: Comply with BHMA A156.3, Grade 1.
 1. Lever design to match lockset trim.
 2. Provide cylinder with cylinder dogging or locking trim.
 3. Provide exit devices properly sized for door width and height.
 4. Provide strike as recommended by manufacturer for application indicated.
 5. Releasable in normal operation with 5-lb. maximum operating force per California State CBC Chapter 11B-309.4.
 6. Readily openable from egress side with one hand and without tight grasping, tight pinching, or twisting of the wrist to operate.
 7. Comply with CBC Section 1010.1.9 and State Fire Marshal Standard 12-10-3 Exits, Section 12-10-302.
 8. Trim to meet BHMA A156.3 Trim Security Test.
 9. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.

2.04 LOCK CYLINDERS

- A. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
 1. Provide standard, conventional, and full size interchangeable core (FSIC) type cylinders, Grade 1, with six-pin core in compliance with BHMA A156.5 at locations indicated.
 2. Provide cylinders from same manufacturer as locking device.
 3. Provide cams and/or tailpieces as required for locking devices.
 4. Furnish keyed at factory of lock manufacturer where permanent records are maintained.
 5. Locks and cylinders by the same manufacturer.
 6. Within specific Door Sections, when provisions for lock cylinder are being referenced to this Section, provide specified lock cylinder and keyed to building keying system, unless otherwise indicated.

2.05 MORTISE LOCKS

- A. Comply with SB 211 (DSA Bulletin 11-05); CBC section 1010.1.11.
- B. Mortise Locks: Complying with BHMA A156.13, Grade 1.
 1. Latchbolt Throw: 3/4 inch, minimum.
 2. Deadbolt Throw: 1 inch, minimum.
 3. Backset: 2-3/4 inch unless otherwise indicated.

4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
 - a. Flat-Lip Strikes: Provide for locks with three piece antifriction latchbolts as recommended by manufacturer.
 - b. Extra-Long-Lip Strikes: Provide for locks used on frames with applied wood casing trim.
 - c. Rabbet Front and Strike: Provide on locksets for use with rabbeted meeting rails.
 - d. Finish: To match lock or latch.

2.06 DOOR PULLS AND PUSH PLATES

- A. Door Pulls and Push Plates: Comply with BHMA A156.6.
 1. Pull Type: Straight, unless otherwise indicated.
 2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
 - a. Edges: Beveled, unless otherwise indicated.
 3. Material: Stainless steel, unless otherwise indicated.
 4. Provide door pulls and push plates on doors without a lockset, latchset, exit device, or auxiliary lock unless otherwise indicated.
 5. On solid doors, provide matching door pull and push plate on opposite faces.
 6. On glazed storefront doors, provide matching door pulls/push plates on both faces unless otherwise indicated.

2.07 CLOSERS

- A. Closers: Comply with BHMA A156.4, Grade 1.
 1. Type: Surface mounted to door.
 2. Provide door closer on each exterior door.
 3. Provide door closer on each fire-rated and smoke-rated door.
 - a. Spring hinges are not an acceptable self-closing device, unless otherwise indicated.
 4. Where an overlapping astragal is included on pairs of swinging doors, provide coordinator to ensure door leaves close in proper order.
 5. At corridor entry doors, mount closer on room side of door.
 6. At outswinging exterior doors, mount closer on interior side of door.

2.08 KICK PLATES

- A. Kick Plates: Provide along bottom edge of push side of every door with closer, except aluminum storefront and glass entry doors, unless otherwise indicated.
 1. Size: 12 inch high by 2 inch less door width (LDW) on push side of door.

2.09 FLOOR STOPS

- A. Floor Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.

1. Provide floor stops when wall surface is not available; be cautious not to create a tripping hazard.
2. Type: Manual hold-open, with pencil floor stop.
3. Material: Aluminum housing with rubber insert.

2.10 WALL STOPS

- A. Wall Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
1. Provide wall stops to prevent damage to wall surface upon opening door.
 2. Type: Bumper, concave, wall stop.
 3. Material: Aluminum housing with rubber insert.

2.11 THRESHOLDS

- A. Thresholds: Comply with BHMA A156.21.
1. Provide threshold at interior doors for transition between two different floor types, and over building expansion joints, unless otherwise indicated.
 2. Provide threshold at each exterior door, unless otherwise indicated.
 3. Type: Flat surface.
 4. Material: Aluminum.
 5. Threshold Surface: Fluted horizontal grooves across full width.
 6. Field cut threshold to profile of frame and width of door sill for tight fit.
 7. Provide non-corroding fasteners at exterior locations.

2.12 WEATHERSTRIPPING AND GASKETING

- A. Weatherstripping and Gasketing: Comply with BHMA A156.22.
1. Head and Jamb Type: Adjustable.
 2. Door Sweep Type: Encased in retainer.
 3. Material: Aluminum, with brush weatherstripping.
 4. Provide gasketing for smoke and draft control doors (Indicated as "S" on Drawings) that complies with local codes, requirements of assemblies tested in accordance with UL 1784.
 5. Refer to Section 08 1416 when wood door to frame sealing system is applied by door manufacturer.
 6. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated; .
 7. Provide door bottom sweep on each exterior door, unless otherwise indicated.

2.13 SILENCERS

- A. Silencers: Provide at equal locations on door frame to mute sound of door's impact upon closing.

1. Single Door: Provide three on strike jamb of frame.
2. Pair of Doors: Provide two on head of frame, one for each door at latch side.
3. Material: Rubber, gray color.

2.14 KEY CONTROL SYSTEMS

- A. Key Control Systems: Comply with guidelines of BHMA A156.28.
 1. Provide keying information in compliance with DHI (KSN) standards.
 2. Keying: Grand master keyed.
 3. Include construction keying and control keying with removable core cylinders.
 - a. Provide temporary keyed-alike cores.
 - b. Remove at substantial completion and install permanent cylinders/cores in District's presence.
 - 1) Demonstrate that construction key no longer operates.
 4. Key to existing keying system.
 - a. Factory registered master key system.
 - b. Schlage Restricted keyway, interchangeable core.
 - c. Contact District Locksmith with for keying requirements.
 - d. Key blanks available only from factory-direct sources, not available from after-market key blank manufacturers.
 - e. For estimate use factory GMK charge.
 - f. Furnish District's written approval of the system.
 5. Supply keys in following quantities:
 - a. 4 each Master keys.
 - b. 1 each Grand Master keys.
 - c. 6 each Construction Master keys.
 - d. 15 each Construction keys.
 - e. 2 each Construction Control keys.
 - f. 2 each Control keys if new system.
 - g. 2 each Extra Cylinder cores.
 - h. 2 each Change keys for each keyed core.
 6. Key Management System: For each keyed lock on project, provide one set of consecutively numbered duplicate key tags with hanging hole and snap catch.
 7. Security Key Tags: For each keyed lock on project, provide one set of matching key tags for permanent attachment to one key of each set.
 8. Provide key collection envelopes, receipt cards, and index cards in quantity suitable to manage number of keys.
 9. Deliver keys with identifying tags to District by security shipment direct from hardware supplier.
 10. Bitting List: Use secured shipment direct from point of origination to District upon completion.

11. Permanent Keys and Cores: Stamped with applicable key marking for identification. Do not include actual key cuts within visual key control marks or codes. Stamp permanent keys "Do Not Duplicate."

2.15 FIRE DEPARTMENT LOCK BOX

- A. Manufacturers:
 1. Knox Company; Knox-Box Rapid Entry System; Model 3227: www.knoxbox.com.
 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Fire Department Lock Box: at Buildings or Site Walls
 1. Heavy-duty, recessed, solid stainless-steel box with hinged door and interior gasket seal; single drill resistant lock with dust covers and tamper alarm.
 2. Capacity: Holds 10 keys.
 3. Finish: Manufacturer's standard dark bronze.
 4. Mounted to posts at manual gates (for driveways/roads) and as indicated on Drawings:
 - a. Key lock boxes shall be located at driver's side of gate entrance in a visible location as directed by Fire Department.
 - 1) Box shall be welded secure to metal posts. Box shall be 4 to 4-1/2 feet from top of box to finished grade.
 - b. Obtain approval from Fire Department of mounting location/position and operating standards before installation.
 - c. Products:
 - 1) Knox Company; Model 3208 or 3166, as applicable.
 - 2) Knox Decal 1001 shall be placed on gate.
 - 3) Substitutions: See Section 01 60 00 - Product Requirements. Only if allowed or required by local Fire Department.
- C. Provide Knox Fire Department alert decals on all exterior doors of the facility and on all interior doors that keys have been furnished for within the lock box.
 1. If the building/facility is protected with a fire alarm system or burglar alarm system, the lock boxes shall be "tamper" monitoring.
 2. The tamper monitoring must include the following:
 - a. All central stations shall be UL listed.
 - b. For combination Fire/Burglar Alarm Panels, the Knox Box monitoring shall be through the fire side of the panel.
 - c. Central stations upon receiving a Knox Box tamper alarm signal shall:
 - 1) Notify and respond to local Police Department (Knox Box tamper).
 - 2) Notify and respond to the local Fire Department (Knox Box tamper).

2.16 FINISHES

- A. Finishes: Identified in Section 08 06 71 - Door Hardware Schedule.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available to power operated devices and of correct characteristics.
- C. Field-verify existing conditions and measurements prior to ordering hardware. Fill existing hardware cut outs not being used by the new hardware.
- D. Remove existing hardware not being reused. Tag and bag removed hardware, turn over to District.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
 - 1. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes.
 - 2. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation. Remove and reinstall or replace work deemed defective by Architect.
 - a. Gaskets:
 - 1) Install jamb-applied gaskets before closers, overhead stops, rim strikes, etc; fasten hardware over and through these seals.
 - 2) Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.
 - b. When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.
 - c. Use manufacturers' fasteners furnished with hardware items, or submit Request for Substitution with Architect.
 - d. Replace fasteners damaged by power-driven tools.
 - 3. Core concrete for exterior door stop anchors. Set anchors in approved non-shrink grout.
 - 4. Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to District items not scheduled for reuse.
- B. Install hardware for smoke and draft control doors in accordance with NFPA 105.
- C. Existing frames and doors to be retrofitted with new hardware:
 - 1. Field-verify conditions and dimensions prior to ordering hardware. Fill existing hardware cut outs not being reused by the new hardware. Remove existing hardware not being reused, return to Owner unless directed otherwise.
 - 2. Remove existing floor closers not scheduled for reuse, fill cavities with non-shrinking concrete and finish smooth.
 - 3. Cut and weld existing steel frames currently prepared with 2.25 inch height strikes. Cut an approximate 8 inch section from the strike jamb and weld in a reinforced section to accommodate specified hardware's strike.

4. Patch and weld flush filler pieces into existing door hardware preparations in steel doors and frames, leave surfaces smooth.
 5. Glue in solid wood block fillers to fill cut outs in existing wood doors, sand surfaces smooth. Alternatively, use an approved epoxy-based wood filler product, submit product data for approval.
 6. Where existing wall conditions will not allow door to swing using the scheduled hinges, provide wide-throw hinges and if needed, extended arms on closers.
 7. Provide manufacturer's recommended brackets to accommodate the mounting of closers on doors with flush transoms.
- D. Use templates provided by hardware item manufacturer.
- E. Do not install surface mounted items until application of finishes to substrate are fully completed.
- F. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
1. Comply with California Building Code, Section 1010.1.9.2, 11B-309.4 and 11B-404.2.7.
 - a. Refer also to CBC requirements noted in Part 1 of this section.
 2. For Steel Doors and Frames: Install in compliance with DHI (LOCS) recommendations.
 3. For Steel Doors and Frames: Refer to Section 08 11 13.
 4. For Wood Doors: Install in compliance with DHI WDHS.3 recommendations.
 5. Flush Wood Doors: Refer to Section 08 14 16.
 6. Mounting heights in compliance with ADA Standards and CBC Chapter 11B:
 - a. Locksets: 34 to 44 inches.
 - b. Push/Pulls: 34 to 44 inches.
 - c. Dead Locks: 44 inches.
 - d. Exit Devices: 36 (clear) to 44 inches.
 - e. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware when compliant with codes.
- G. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.
1. Refer to Section 07 92 00 for additional requirements.
- H. Locate floor stops no more that 4 inches (maximum outside dimension) from walls and not within paths of travel. See Article "Hinges" in Part 2 regarding hinge widths, door should be well clear of point of wall reveal. Point of door contact no closer to the hinge edge than half the door width. Where situation is questionable or difficult, contact Architect for direction.
- I. Locate overhead stops for minimum 90 degrees at rest and for maximum allowable degree of swing.

3.03 FIELD QUALITY CONTROL

- A. Perform field inspection and testing under provisions of Section 01 40 00 - Quality Requirements.
- B. Provide an Architectural Hardware Consultant (AHC) to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.04 ADJUSTING

- A. Adjust work under provisions of Section 01 70 00 - Execution and Closeout Requirements.
- B. Adjust hardware for smooth operation.
 - 1. Adjust and check for proper operation and function. Replace units, which cannot be adjusted to operate freely and smoothly.
 - a. Hardware damaged by improper installation or adjustment methods: repair or replace to District's satisfaction.
 - b. Adjust doors to fully latch with no more than 1 pound of pressure.
 - c. Adjust delayed-action closers on fire-rated doors to fully close from fully-opened position in no more than 10 seconds.
 - d. Adjust door closers per "Commissioning" article below.
- C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.
- D. Fire-rated doors (NFPA 80):
 - 1. Wood Doors: Adjust to 1/8 inch clearance at heads, jambs, and meeting stiles.
 - 2. Steel Doors: Adjust to 1/16 inch minimum to 3/16 inch maximum clearance at heads, jambs, and meeting stiles.
 - 3. Adjust wood and steel doors to 3/4 inch maximum clearance (undercut) above threshold or finish floor material under door.
- E. Inspection of fire door assemblies and means-of-egress panic-hardware doors:
 - 1. Per NFPA 80 5.2.1:
 - a. Provide an independent third-party inspection service to prepare a report listing these doors, and include a statement that there are zero deficiencies with the fire-rated assemblies and the openings with panic hardware.
 - b. Certification, Testing and Quality Control shall be in accordance with Section 01 45 33 - Code-Required Special Inspections.
 - c. All doors hardware and installation will be inspected by a third party selected by the Architect/District.
- F. Final inspection: Installer to provide letter to District that upon completion installer has visited the Project and has accomplished the following:
 - 1. Has re-adjusted hardware.
 - 2. Has evaluated maintenance procedures and recommend changes or additions, and instructed District's personnel.
 - 3. Has identified items that have deteriorated or failed.
 - 4. Has submitted written report identifying problems.

3.05 COMMISSIONING:

- A. Conduct these tests prior to request for certificate of substantial completion:
 - 1. With installer, access control contractor and electrical contractor present, test electrical, electronic and electro-pneumatic hardware systems for satisfactory operation.
 - 2. With installer and electrical contractor present, test hardware interfaced with fire/life-safety system for proper operation and release.
 - 3. Inspection of fire door assemblies and means-of-egress panic-hardware doors:
 - a. Contractor shall provide an independent third-party inspection service to prepare a report listing the proper operation and functionality of these doors.
 - b. Include a statement that there are zero deficiencies with the fire-rated assemblies and the openings with panic hardware.
 - 4. With installer present, test door hardware operation for compliance with push and pull force requirements per ADA and CBC.

3.06 CLEANING

- A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.
- D. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

3.07 PROTECTION

- A. Protect finished Work under provisions of Section 01 70 00 - Execution and Closeout Requirements.
- B. Do not permit adjacent work to damage hardware or finish.

3.08 CLOSEOUT

- A. Return of temporary cores for return/receipt by Contractor.
- B. Final inspection: Installer to provide letter to District that upon completion installer has visited the Project and has accomplished the following:
 - 1. Has re-adjusted hardware.
 - 2. Has evaluated maintenance procedures and recommend changes or additions, and instructed District's personnel.
 - 3. Has identified items that have deteriorated or failed.
 - 4. Has submitted written report identifying problems.

3.09 SCHEDULE OF FINISH HARDWARE

- A. See door schedule in drawings for hardware set assignments.

- B. No hardware shall be ordered until Finish Hardware has been reviewed and approved by Architect's hardware consultant.
- C. Provide Factory order numbers for all products supplied on this project as part of close out documents for Owner's warranty records.
- D. See schedule in Section 08 06 71 - Door Hardware Schedule.

END OF SECTION

SECTION 08 80 00
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Insulating glass units.
- B. Glazing units.
- C. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 07 92 00 - Joint Sealants: Sealants for other than glazing purposes.
- B. Section 08 11 13 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
- C. Section 08 14 16 - Flush Wood Doors: Glazed lites in doors.
- D. Section 10 28 00 - Toilet Accessories: Mirrors.

1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
- F. ASTM C1036 - Standard Specification for Flat Glass.
- G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
- H. ASTM C1193 - Standard Guide for Use of Joint Sealants.
- I. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass.
- J. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings.
- K. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
- L. GANA (GM) - GANA Glazing Manual.
- M. GANA (SM) - GANA Sealant Manual.
- N. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use.
- O. NFRC 100 - Procedure for Determining Fenestration Product U-factors.
- P. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.
- Q. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples 8 by 8 inch in size of glass units.
- E. Samples: Submit 4 inch long bead of glazing sealant, color as selected.
- F. Certificate: Certify that products of this section meet or exceed specified requirements.
- G. Manufacturer's qualification statement.
- H. Installer's qualification statement.
- I. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in District's name and registered with manufacturer.
- J. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM), GANA (SM), and IGMA TM-3000 for glazing installation methods. Maintain one copy on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.07 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
 - 1. Remedial Provisions: Upon notification of defects, within the warranty period, party providing warranty or guarantee shall replace the glass and glazing at no cost to District.
- B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Comply with the all applicable codes and ordinances, including California Building Code (CBC), Title 24, Part 2, Chapter 24 as amended and adopted by authorities having jurisdiction, and US Consumer Product Safety Commission Standard 16 CFR 1201 CI and CII.
- B. Where safety glass is indicated or required, provide glazing materials that conform to ANSI Z97.1 and CPSC 16 CFR 1201 and are so identified in accordance with CBC Section 2406.3.
- C. Glass Identification:
 - 1. Per CBC Section 2403.1, each light shall bear the manufacturer's label designating the type and thickness of glass.
 - a. When approved by the enforcement agency, labels may be omitted from other than safety glazing materials, provided an affidavit is furnished by the glazing contractor certifying that each light is glazed in accordance with approved plans and specifications.
 - b. Identification of safety glazing material installed in hazardous locations as defined in Section 2406 of this chapter shall be identified by label which will specify the labeler, whether the manufacturer or installer, and state that safety glazing material has been utilized in such installations.
 - c. The label shall be legible and visible from the inside of the building after installation and shall specify that label shall not be removed.
 - d. Tempered glass shall have an etched manufacturer's label.

2.02 MANUFACTURERS

- A. Glass Fabricators:
 - 1. Glasswerks Inc.: www.glasswerks.com.
 - 2. GlasPro, Inc.: www.glas-pro.com
 - 3. Viracon, Inc: www.viracon.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Float Glass Manufacturers:
 - 1. AGC Glass North America, Inc: www.agcglass.com/#sle.
 - 2. Cardinal Glass Industries: www.cardinalcorp.com/#sle.
 - 3. GlasPro, Inc.: www.glas-pro.com
 - 4. Guardian Glass, LLC: www.guardianglass.com/#sle.
 - 5. Pilkington North America Inc: www.pilkington.com/na/#sle.
 - 6. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
 - 7. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
 - 1. Design Pressure: Calculated in accordance with ASCE 7.
 - a. Where glass thicknesses are not indicated, provide thickness based on the wind pressures required by the California Building Code (CBC), Title 24, Part 2, 2403 and 2404, wind pressure shall be assumed to have a one minute duration.
 - b. Upon first application of design wind load for the specified durations, probability of breakage shall not exceed 8/1000 for vertical glass.
 - c. Probability of breakage relative to glass thermal stress shall not exceed 8/1000 for vertical glass.
 - 2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
 - 3. Seismic Loads: Design and size glazing components to withstand seismic loads and sway displacement in accordance with the requirements of ASCE 7.
 - 4. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
 - 5. Glass thicknesses listed are minimum.
- B. Vapor Retarder and Air Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier.
 - 1. In conjunction with vapor retarder and joint sealer materials described in other sections.
 - 2. To utilize the inner pane of multiple pane insulating glass units for the continuity of the vapor retarder and air barrier seal.
 - 3. To maintain a continuous vapor retarder and air barrier throughout the glazed assembly from glass pane to heel bead of glazing sealant.
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
 - 1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 - 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 - 3. Solar Optical Properties: Comply with NFRC 300 test method.

2.04 GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
 - 1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
 - 2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
 - 3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.

4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
5. Impact Resistant Safety Glass: Complies with ANSI Z97.1 - Class B, or 16 CFR 1201 - Category I criteria.
6. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

2.05 INSULATING GLASS UNITS

A. Manufacturers:

1. Any of the manufacturers specified for float glass.
2. Fabricator certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.
3. AGC Glass North America, Inc: www.agcglass.com/#sle.
4. Cardinal Glass Industries: www.cardinalcorp.com/#sle.
5. Glasswerks: glasswerks.com.
6. Guardian Glass, LLC: www.guardianglass.com/#sle.
7. Pilkington North America Inc: www.pilkington.com/na/#sle.
8. Viracon, Apogee Enterprises, Inc: www.viracon.com/#sle.
9. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
10. Substitutions: See Section 01 60 00 - Product Requirements.

B. Insulating Glass Units: Types as indicated.

1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
3. Metal Edge Spacers: Aluminum, bent and soldered corners.
4. Spacer Color: Black.
5. Edge Seal:
 - a. Single-Sealed System: Provide silicone, polysulfide, or polyurethane sealant as seal applied around perimeter.
 - b. Color: Black.
6. Purge interpane space with dry air, hermetically sealed.

C. Type GL-1 - Insulating Glass Units: Vision glass, double glazed.

1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Coating: Low-E (passive type), on #2 surface.
4. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.

5. Total Thickness: 1 inch.
- D. Type IG-5 - Insulating Glass Units: Safety glazing.
 1. Applications:
 - a. Other locations required by applicable federal, state, and local codes and regulations.
 2. Space between lites filled with air.
 3. Glass Type: Same as Type GL-1 & GL-2 except use fully tempered float glass for both outboard and inboard lites.
 4. Total Thickness: 1 inch.

2.06 BASIS OF DESIGN - INSULATING GLASS UNITS

- A. Basis of Design - Insulating Glass Units: Vision glazing, with Low-E coating.
 1. Applications: Exterior insulating glass glazing unless otherwise indicated.
 2. Space between lites filled with air.
 3. Total Thickness: 1 inch.
 4. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.28, nominal.
 5. Visible Light Transmittance (VLT): 64 percent, nominal.
 6. Solar Heat Gain Coefficient (SHGC): 0.27, nominal.
 7. Visible Light Reflectance, Outside: 12 percent, nominal.
 8. Glazing Method: Dry glazing method, gasket glazing.
 9. Spacer Color: Black.
 10. Edge Seal:
 11. Color: Black.
 12. Purge interpane space with dry air, hermetically sealed.
 13. Outboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
 - a. Low-E Coating: Vitro Architectural Glass (formerly PPG Glass) Solarban 70 on #2 surface.

2.07 GLAZING UNITS

- A. Type G-2 - Monolithic Interior Vision Glazing:
 1. Applications: Interior glazing unless otherwise indicated.
 2. Glass Type: Annealed float glass.
 3. Tint: Clear.
 4. Thickness: 1/4 inch, nominal.
 5. Glazing Method: Dry glazing method, gasket glazing.
- B. Type G-5 - Monolithic Safety Glazing: Non-fire-rated.
 1. Applications:
 - a. Glazed lites in doors, except fire doors.
 - b. Glazed sidelights to doors, except in fire-rated walls and partitions.

- c. Glazed view windows and panels in partitions enclosing athletic activity rooms, except in fire-rated walls and partitions.
 - d. Other locations required by applicable federal, state, and local codes and regulations.
 - e. Other locations indicated on drawings.
- 2. Glass Type: Fully tempered safety glass as specified.
 - 3. Tint: Clear.
 - 4. Thickness: 1/4 inch, nominal.
 - 5. Glazing Method: Dry glazing method, gasket glazing.

2.08 GLAZING COMPOUNDS

- A. Type GC-3 - Polysulfide Sealant: Two component; chemical curing, non-sagging type; ASTM C920, Type M, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.
- B. Type GC-5 - Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

2.09 ACCESSORIES

- A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
 - 1. Width: As required for application.
 - 2. Thickness: As required for application.
- D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.
- E. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that the minimum required face and edge clearances are being provided.

- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- D. Verify that sealing between joints of glass framing members has been completed effectively.
- E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
- C. Monitor and report installation procedures and unacceptable conditions.

3.06 CLEANING

- A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.
- B. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- C. Remove non-permanent labels immediately after glazing installation is complete.
- D. Clean glass and adjacent surfaces after sealants are fully cured.
- E. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.07 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

SECTION 09 05 61
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
 - 1. Resilient tile and sheet.
 - a. Moisture vapor seal is required at all locations to receive resilient flooring regardless of moisture test.
 - 2. Carpet tile.
 - 3. Thin-set ceramic tile and stone tile.
- B. Removal of existing floor coverings.
- C. Preparation of new and existing concrete floor slabs for installation of floor coverings.
- D. Testing of concrete floor slabs for moisture and alkalinity (pH).
- E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
 - 1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.
- F. Patching compound.
- G. Remedial floor coatings.

1.02 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements: Additional requirements relating to testing agencies and testing.
- B. Section 01 74 19 - Construction Waste Management and Disposal: Handling of existing floor coverings removed.
- C. Section 03 30 00 - Cast-in-Place Concrete: Moisture emission reducing curing and sealing compound for slabs to receive adhered flooring, to prevent moisture content-related flooring failures; to remain in place, not to be removed.
- D. Section 03 30 00 - Cast-in-Place Concrete: Limitations on curing requirements for new concrete floor slabs.

1.03 REFERENCE STANDARDS

- A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens).
- B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete.
- C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

- D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- F. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.05 SUBMITTALS

- A. Visual Observation Report: For existing floor coverings to be removed.
- B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
 - 1. Moisture and alkalinity (pH) limits and test methods.
 - 2. Manufacturer's required bond/compatibility test procedure.
- C. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
 - 1. Manufacturer's qualification statement.
 - 2. Manufacturer's statement of compatibility with types of flooring applied over remedial product.
 - 3. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
 - 4. Manufacturer's installation instructions.
 - 5. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.
- D. Testing Agency's Report:
 - 1. Description of areas tested; include floor plans and photographs if helpful.
 - 2. Summary of conditions encountered.
 - 3. Moisture and alkalinity (pH) test reports.
 - 4. Copies of specified test methods.
 - 5. Recommendations for remediation of unsatisfactory surfaces.
 - 6. Include certification of accuracy by authorized official of testing agency.
 - 7. Submit report not more than two business days after conclusion of testing.
- E. Adhesive Bond and Compatibility Test Report.
- F. Floor Moisture Testing Technician Certificate: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician- Grade I certificate.
- G. Copy of RFCI (RWP).

1.06 QUALITY ASSURANCE

- A. Moisture and alkalinity (pH) testing will be performed by an independent testing agency employed and paid by District.
- B. Contractor may perform additional adhesive and bond test with Contractor's own personnel or hire a testing agency.
- C. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
 - 1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project District's project contact information.
- D. Contractor's Responsibility Relating to Independent Agency Testing:
 - 1. Provide access for and cooperate with testing agency.
 - 2. Confirm date of start of testing at least 10 days prior to actual start.
 - 3. Allow at least 4 business days on site for testing agency activities.
 - 4. Achieve and maintain specified ambient conditions.
- E. Floor Moisture Testing Technician Qualifications: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician Certification- Grade I.
- F. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.
- B. Deliver materials in manufacturer's packaging; include installation instructions.
- C. Keep materials from freezing.

1.08 FIELD CONDITIONS

- A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.
- B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:

1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
 2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
 3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
 4. Products:
 - a. ARDEX Engineered Cements, Inc; ARDEX K-15: www.ardexamericas.com.
 - b. H.B. Fuller Construction Products, Inc; TEC Feather Edge Skim Coat: www.tecspecialty.com/#sle.
 - c. Mapei International; Mapei Ultraplan 1 Plus: www.mapei.com.
 - d. Sika Corporation; Sika Level-315: www.sikafloorusa.com.
 - e. USG Corporation; Durock Brand Advanced Skim Coat Floor Patch: www.usg.com/#sle.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.
- C. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
 2. Products:
 - a. Basis of Design Product: Koster VAP I 2000 with Koster SL Premium overlay as manufactured by Koster American Corporation, or approved equal.
 - b. ARDEX Engineered Cements; Ardex MC ULTRA with ARDEX FEATHERFINISH: www.ardexamericas.com/#sle.
 - c. Custom Building Products; TechMVC Moisture Vapor and Alkalinity Barrier: www.custombuildingproducts.com/#sle.
 - d. Floor Seal Technology, Inc; MES 100 with Floor Seal FloorCem SLU: www.floorseal.com/#sle.
 - e. Koster American Corporation; Koster VAP I 2000 with Koster SL Premium overlay: www.kosterusa.com/#sle.
 - f. LATICRETE International, Inc; LATICRETE NXT Vapor Reduction Coating with LATICRETE NXT Level Plus: www.laticrete.com/#sle.
 - g. LATICRETE International, Inc; LATICRETE SUPERCAP Moisture Vapor Control with LATICRETE SUPERCAP Underlayment: www.laticrete.com/#sle.
 - h. Maxxon Corporation; Aquafin SG2: www.maxxon.com/#sle.
 - i. Sika Corporation; Sikafloor Moisture Tolerance Epoxy Primer and Sikafloor Self-Leveling Moisture Tolerant Resurfacer: www.sikafloorusa.com/#sle.

- j. Tnemec Company, Inc; Series 208 Epoxoprime MVT: www.tnemec.com/#sle.
- k. USG Corporation; Durock Brand CST Moisture Vapor Reducer: www.usg.com/#sle.
- l. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

- A. Follow recommendations of testing agency.
- B. Perform following operations in the order indicated:
 - 1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
 - a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
 - b. Removal of existing floor covering.
 - 2. Existing concrete slabs with coatings or penetrating sealers/hardeners/dustproofers:
 - a. Do not attempt to remove coating or penetrating material.
 - b. Do not abrade surface.
 - 3. Preliminary cleaning.
 - 4. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
 - 5. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 - 6. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 - 7. Specified remediation, if required.
 - 8. Patching, smoothing, and leveling, as required.
 - 9. Other preparation specified.
 - 10. Adhesive bond and compatibility test.
 - 11. Protection.
- C. Remediations:
 - 1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
 - 2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
 - 3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

- A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.
- B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

- A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.
- B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F1869 and as follows.
- D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.
- F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F2170 Procedure A and as follows.
- D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.
- F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
 - 1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
 - 2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
 - 3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.
- C. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

- A. See individual floor covering section(s) for additional requirements.
- B. Comply with recommendations of testing agency.
- C. Comply with requirements and recommendations of floor covering manufacturer.
- D. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
- E. Do not fill expansion joints, isolation joints, or other moving joints.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

- A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 APPLICATION OF REMEDIAL FLOOR COATING

- A. Comply with requirements and recommendations of coating manufacturer.
- B. Install remedial coating over all concrete floor areas where moisture emission and/or alkalinity exceeds the floor covering manufacturer's published limits.
- C. Prepare floor areas to be coated in accordance with coating manufacturer's requirements.
 - 1. Mask and protect adjacent wall and floor surfaces from damage due to this work.
- D. Apply coating using manufacturer's recommended procedures.
- E. Apply 1/8 inch thick cementitious surfacing over coating in areas to receive adhesively applied floor coverings.
- F. Verify that prepared floor slab has moisture emission rate and alkalinity meeting requirements.

3.10 PROTECTION

- A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Metal channel ceiling framing.
- D. Shaft wall system.
 - 1. Elevator shaft enclosures.
 - 2. Service shaft enclosures (for piping, ductwork, air plenums, electrical conduit and similar services).
 - 3. Stairwell enclosures.
 - 4. Structural column enclosures (fireproofing).
- E. Acoustic insulation.
- F. Gypsum sheathing.
- G. Cementitious backing board.
- H. Gypsum wallboard.
- I. Joint treatment and accessories.
- J. Acoustic (sound-dampening) wall and ceiling board.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 05 40 00 - Cold-Formed Metal Framing: Structural steel stud framing.
- C. Section 06 10 00 - Rough Carpentry: Building framing and sheathing.
- D. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.
- E. Section 07 21 00 - Thermal Insulation: Acoustic insulation.
- F. Section 07 25 00 - Weather Barriers: Water-resistive barrier over sheathing.
- G. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- H. Section 09 30 00 - Tiling: Tile backing board.

1.03 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members.
- B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units.
- C. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units.

- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 1. Use 2015 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- F. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
- G. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - 1. Use 2015 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- H. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members.
- I. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- J. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - 1. Use 2015 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- K. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.
 - 1. Use 2013 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- L. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
 - 1. Use 2015 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- M. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - 1. Use 2014 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- N. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base.
 - 1. Use 2014a as indicated in 2019 CBC Ch. 35 Referenced Standards.
- O. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - 1. Use 2013 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- P. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing.
 - 1. Use 2013a as indicated in 2019 CBC Ch. 35 Referenced Standards.
- Q. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units.
 - 1. Use 2014 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- R. ASTM C1396/C1396M - Standard Specification for Gypsum Board.
 - 1. Use 2014a as indicated in 2019 CBC Ch. 35 Referenced Standards.
- S. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.

1. Use 2015 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- T. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
- U. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 1. Use 2016 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- V. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- W. ASTM E413 - Classification for Rating Sound Insulation.
- X. GA-216 - Application and Finishing of Gypsum Panel Products.
 1. Use 2016 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- Y. GA-600 - Fire Resistance Design Manual.
 1. Use 2015 as indicated in 2019 CBC Ch. 35 Referenced Standards.
- Z. UL (FRD) - Fire Resistance Directory.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on gypsum board, accessories, and joint finishing system.
 1. Joint Treatment Materials: Submit manufacturer's product data, indicating VOC content.
- C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- D. Application Procedures: Submit a general written description of procedures to be followed where fire-rated work is being done and where alternative assemblies are proposed.
- E. Samples: Submit two samples of gypsum board finished with proposed texture application, 12 by 12 inches in size, illustrating finish color and texture.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum five years of experience.
- B. Regulatory Requirements: Conform to California Building Code (CBC), Title 24, Part 2, Chapter 7, Chapter 8, and Chapter 25, as amended and adopted by authorities having jurisdiction.
- C. Fire Resistance Rating:
 1. Certain partition constructions gypsum wallboard systems are required to meet fire resistive requirements of ASTM E119 and applicable building Codes.
 2. Construction which forms component parts of such assemblies shall be constructed to afford the fire resistance required by Code for the location and condition of construction indicated.
 3. See required ratings and designs on Drawings.
 4. Construction shall conform to requirements of these tested assemblies.
 5. Fire Resistive Gypsum Board: Material shall bear the Underwriters' Laboratories, Inc. (UL) label or label of other testing organization acceptable to the State Fire Marshal.

- D. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver gypsum board and accessories in manufacturer's original unopened containers, bundles or rolls bearing manufacturer's identification.
- B. Store materials inside the building or in other dry weather tight enclosure. Stack gypsum board flat and off the floor. Do not stack long lengths over shorter lengths.
- C. Store flammable adhesives away from fire, sparks and smoking areas.
- D. Handle gypsum board to prevent damage to edges, ends, and surfaces.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
 - 1. See PART 3 for finishing requirements.
- B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
 - 1. Acoustic Attenuation: STC as indicated calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- C. Shaft Walls at HVAC Shafts: Provide completed assemblies with the following characteristics:
 - 1. Air Pressure Within Shaft: Sustained loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
 - 2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- D. Fire-Resistance-Rated Assemblies: Provide completed assemblies with the following characteristics:
 - 1. CBC Chapter 7 Item Numbers: Comply with applicable requirements of CBC Chapter 7 Tables for the particular assembly; as indicated on Drawings.
 - 2. Gypsum Association File Numbers: Comply with requirements of GA-600 for the particular assembly; as indicated on Drawings.
 - 3. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD); as indicated on Drawings.

2.02 METAL FRAMING MATERIALS

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. Cemco: www.cemcosteel.com.
 - a. ICC ESR-2012.
 - b. Viper-x Studs: IAPMO ER-0524, ICC ESR-2620.
 - 2. ClarkDietrich Building Systems: www.clarkdietrich.com/#sle.
 - a. ICC ESR-1166P

3. Marino: www.marinoware.com/#sle.
 - a. Viper-x Stud: IAPMO ER-0524, ICC ESR-2620.
 - b. ICC ESR-4062.
 4. Phillips Manufacturing Co: www.phillipsmfg.com/#sle.
 5. SCAFCO Corporation: www.scafco.com/#sle.
 6. Steel Stud Manufacturers Association www.ssma.com.
 - a. ICC ESR-3064P
 7. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Structural Steel Framing for Application of Gypsum Board: As specified in Section 05 40 00.
- C. Non-structural Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
1. Studs: C-shaped with knurled or embossed faces.
 2. Runners: U shaped, sized to match studs.
 3. Headers: As detailed on Drawings or ProX Header per IAPMO ER-2086.
 4. Ceiling Channels: C-shaped.
- D. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.
1. Products:
 - a. Same manufacturer as other framing materials.
 2. Gypsum Shaft Wall System: Characteristics of selected components are described below for purposes of indicating discrete gypsum board shaft wall systems which are manufacturers' standard assemblies. Provide complete shaft wall systems which comply with requirements indicated.
 3. Cavity Shaft Wall Systems: Provide assemblies consisting of gypsum shaft wall boards inserted between U- or J-shaped metal floor and ceiling tracks; with specially shaped studs engaged in tracks and fitted between shaftwall boards; and gypsum boards on finished side or sides applied to studs in number of layers, thicknesses and arrangement indicated.
 - a. Stud Shape:
 - 1) I, C-H or double E.
 - b. Stud Thickness, minimum thickness of base metal, or as required for span:
 - 1) 0.0329-inch
 - c. Stud Depth: Not less than;
 - 1) 4 inches.
 - 2) 6 inches.
 - 3) As indicated.
 - d. Room-Side Finish:
 - 1) As indicated on Drawings and to match surrounding and adjacent finishes.
 - 2) One layer of 5/8-inch thick gypsum board.
 - 3) Two layers of 5/8-inch thick gypsum board.

- 4) As indicated on Drawings.
 - e. Shaft-Side Finish: One layer 5/8-inch gypsum board; provide only where finish is indicated on shaft side as well as room side, otherwise leave exposed.
 - f. Cavity Insulation: Provide sound attenuation blankets in cavity formed by studs between shaftwall board and room-side finish.
- E. Notched Metal Stud/Channel Backing and Sheet Metal Backing: 54 mil (0.0566) inch thick, galvanized for attachment and support of products to be attached to framing..
- 1. As indicated on Drawings.
 - 2. Notched 16 gage(54-mil) stud covering full width of two stud spacing by 36 inch wide minimum.
 - 3. Optional: 6 by 1-1/4 inch by 14 gage flush mount backing with pre-punched screw holes, FLUSH-MOUNT Backing by Metal-Lite Inc., www.metal-lite.net or approved equivalent.
- F. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws, and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
- 1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100.
 - 2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot-dipped galvanized coating.
 - 3. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.
 - 4. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-resistance rating of the wall assembly.
 - a. Products:
 - 1) ClarkDietrich; BlazeFrame RipTrak: www.clarkdietrich.com/#sle.
 - 2) FireTrak Corporation; Posi Klip: www.fire-trak.com/#sle.
 - 3) Metal-Lite, Inc; The System: www.metal-lite.net/#sle.
 - 4) Super Stud Building Products, Inc; Slotted Deflection Track: www.buysuperstud.com/#sle.
 - 5) Substitutions: See Section 01 60 00 - Product Requirements.
- G. Deflection and Firestop Track: Intumescent strip factory-applied to track flanges expands when exposed to heat or flames to provide a perimeter joint seal.
- 1. Products:
 - a. BlazeFrame: "BlazeFrame"; www.blazeframe.com.
 - b. Brady Sliptrack Systems: FAS Track; www.sliptrack.com, ICC-ES ESR-2012.
 - c. CEMCO: FAS Track; www.cemcosteel.com, ICC-ES ESR-2012.
 - d. ClarkDietrich; BlazeFrame Firestop Deflection Track: www.clarkdietrich.com/#sle.
 - e. Rectorseal, Inc.; Track-Safe: www.biofireshield.com.
 - f. Ware Industries, Inc. (dba Marinoware): ViperTrack; www.marinoware.com, ICC-ES ESR-2620.
 - g. Substitutions: See Section 01 60 00 - Product Requirements.
- H. Preformed Top Track Firestop Seal:

1. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.
2. Products:
 - a. CEMCO: HOT ROD Type X and XL; www.cemcosteel.com, ICC-ES ESR-2012.
 - b. Hilti, Inc; Top Track Seal CFS TTS: www.us.hilti.com/#sle.
 - c. Ware Industries, Inc. (dba Marinoware): HOT ROD Type X and XL; www.marinoware.com, ICC-ES ESR-2620.
 - d. Specified Technologies Inc; SpeedFlex TTG Track Top Gasket: www.stfirestop.com/#sle.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.
- I. Non-structural Framing Accessories:
 1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
 2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
 - a. Provide a premanufactured wall brace compliant with CBC Section 1607A.15.
 - b. Materials: ASTM A36/A36M formed sheet steel support member with factory-welded ASTM A1003/A1003M steel plate base.
 - c. Height: 35-3/4 inches.
 - d. Products:
 - 1) ClarkDietrich; Pony Wall (PW): www.clarkdietrich.com/#sle.
 - 2) The Steel Network, Inc.; MidWall; www.steelnetwork.com.
 - 3) USG, Inc.; www.usg.com.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.
 - e. Alternate Method Partial-Height Wall Brace: Provide steel post as indicated on Drawings.
 3. Framing Connectors: ASTM A653/A653M G90 galvanized steel clips; secures cold rolled channel to wall studs for lateral bracing.

2.03 BOARD MATERIALS

- A. General: Gypsum board, joint treatment and finishing materials shall be manufactured from asbestos-free materials.
- B. Manufacturers - Gypsum-Based Board:
 1. CertainTeed Corporation: www.certainteed.com/#sle.
 2. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
 3. National Gypsum Company: www.nationalgypsum.com/#sle.
 4. PABCO Gypsum: www.pabcogypsum.com/#sle.
 5. USG Corporation: www.usg.com/#sle.
 6. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.

2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
 - b. Mold resistant board is required at all locations.
 3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 4. Thickness:
 - a. Vertical Surfaces: 5/8 inch.
 - b. Ceilings: 5/8 inch.
 - c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
 5. Mold Resistant Paper Faced Products:
 - a. CertainTeed Corporation; M2Tech 5/8" Type X Moisture & Mold Resistant Drywall: www.certainteed.com/#sle.
 - b. CertainTeed Corporation; ProRoc Brand Moisture & Mold Resistant Gypsum Board.
 - c. Georgia-Pacific Gypsum; ToughRock Mold-Guard: www.gpgypsum.com/#sle.
 - d. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard: www.gpgypsum.com/#sle.
 - e. National Gypsum Company; Gold Bond XP Gypsum Board: www.nationalgypsum.com/#sle.
 - f. PABCO Gypsum; MOLD CURB® PLUS Regular Mold and Moisture- Resistant Gypsum Board: www.pabco gypsum.com/#sle.
 - g. PABCO Gypsum; MOLD CURB® PLUS Type X Mold and Moisture- Resistant Gypsum Board: www.pabco gypsum.com/#sle.
 - h. USG Corporation; USG Sheetrock Brand EcoSmart Panels Mold Tough Firecode X: www.usg.com/#sle.
 - i. USG Corporation; Sheetrock Brand Mold Tough Gypsum Panels.
 - j. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Abuse Resistant Wallboard:
1. Application: High-traffic areas indicated.
 - a. Corridors.
 - b. Restrooms.
 - c. Storage Rooms.
 - d. Areas as indicated on Drawings.
 - e. Provide up to 96 inches, minimum.
 2. Surface Abrasion: Level 2, minimum, when tested in accordance with ASTM C1629/C1629M.
 3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
 4. Soft Body Impact: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
 5. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 6. Paper-Faced Type: Gypsum wallboard, as defined in ASTM C1396/C1396M.

7. Type: Fire-resistance-rated Type X, UL or WH listed.
8. Thickness: 5/8 inch.
9. Edges: Tapered.
10. Paper-Faced Products:
 - a. CertainTeed Corporation; Extreme Abuse Resistant Drywall with M2Tech:
www.certainteed.com/#sle.
 - b. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold Guard Abuse-Resistant:
www.gpgypsum.com/#sle.
 - c. National Gypsum Company; Gold Bond Hi-Abuse XP Gypsum Board:
www.nationalgypsum.com/#sle.
 - d. PABCO Gypsum; ABUSE CURB® Type X Gypsum Board:
www.pabco gypsum.com/#sle.
 - e. USG Corporation; USG Sheetrock Brand Mold Tough AR Firecode X Panels:
www.usg.com/#sle.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.

E. Impact Resistant Wallboard:

1. Application: High-traffic areas indicated, typical at gymnasium building, corridors, and storage rooms unless noted otherwise.
 - a. Provide up to 96 inches, minimum.
2. Surface Abrasion: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
4. Soft Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
5. Hard Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
6. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
7. Type: Fire-resistance-rated Type X, UL or WH listed.
8. Thickness: 5/8 inch.
9. Edges: Tapered.
10. Paper-Faced Products:
 - a. CertainTeed Corporation; Extreme Impact Resistant Drywall with M2Tech:
www.certainteed.com/#sle.
 - b. National Gypsum Company; Gold Bond Hi-Impact XP Gypsum Board:
www.nationalgypsum.com/#sle.
 - c. PABCO Gypsum; PABCO® Impact Resistant Type X Gypsum Board:
www.pabco gypsum.com/#sle.
 - d. USG Corporation; USG Sheetrock Brand Mold Tough VHI Firecode X Panels:
www.usg.com/#sle.

F. Backing Board For Wet Areas:

1. Application: Surfaces behind tile in wet areas including locations where noted.

2. Application: Horizontal surfaces behind tile in wet areas including countertops and _____.
 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 4. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
 - a. Thickness: 1/2 inch.
 - b. Products:
 - 1) Custom Building Products; Wonderboard: www.custombuildingproducts.com/#sle.
 - 2) National Gypsum Company; PermaBase Cement Board: www.nationalgypsum.com/#sle.
 - 3) USG Corporation; Durock Cement Board Next Gen: www.usg.com.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.
- G. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
1. Application: Vertical surfaces behind thinset tile, except in wet areas.
 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 4. Type X Thickness: 5/8 inch.
 5. Regular Board Thickness: 5/8 inch.
 6. Edges: Tapered.
 7. Products:
 - a. CertainTeed Corporation; ProRoc Brand Moisture & Mold Resistant Gypsum Board.
 - b. Georgia-Pacific Gypsum; ToughRock Mold-Guard Gypsum Board: www.gpgypsum.com/#sle.
 - c. Lafarge North America Inc; Mold Defense Drywall.
 - d. National Gypsum Company; Gold Bond XP Gypsum Board: www.nationalgypsum.com/#sle.
 - e. USG Corporation; Sheetrock Brand Mold Tough Gypsum Panels.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.
- H. Acoustical Sound Dampening Wall and Ceiling Board: Two layers of heavy paper-faced, high-density gypsum board separated by a viscoelastic polymer layer and capable of achieving STC rating of 50 or more in typical stud wall assemblies as calculated in accordance with ASTM E413 and when tested in accordance with ASTM E90.
1. Thickness: 5/8 inch.
 2. Long Edges: Tapered.
 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 4. Products:

- a. National Gypsum Company; Gold Bond SoundBreak XP Gypsum Board:
www.nationalgypsum.com/#sle.
 - b. Pabco Gypsum; QUIETROCK® ES Type X Sound Damped Gypsum Panel:
www.QuietRock.com
 - c. Pabco Gypsum; QUIETROCK® ES MR Type X Mold Resistant Sound Damped Gypsum Panel: www.QuietRock.com
 - d. Pabco Gypsum; QUIETROCK® 510 Regular Sound Damped Gypsum Panel:
www.QuietRock.com
 - e. Pabco Gypsum; QUIETROCK® 530 Sound Damped Gypsum Panel:
www.QuietRock.com
 - f. Pabco Gypsum; QUIETROCK® 530 RF Sound Damped Gypsum Panel:
www.QuietRock.com
 - g. Pabco Gypsum; QUIETROCK® 545 Sound Damped Gypsum Panel:
www.QuietRock.com
 - h. Substitutions: See Section 01 60 00 - Product Requirements.
- I. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
- 1. Application: Exterior sheathing, unless otherwise indicated.
 - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 3. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
 - 4. Core Type: Regular and Type X, as indicated.
 - 5. Type X Thickness: 5/8 inch.
 - 6. Regular Board Thickness: 5/8 inch.
 - 7. Edges: Square, for vertical application or horizontal.
 - 8. Glass Mat Faced Products:
 - a. CertainTeed Corporation; GlasRoc Brand.
 - b. Georgia-Pacific Gypsum; DensGlass Sheathing: www.gpgypsum.com/#sle.
 - c. Georgia-Pacific Gypsum; DensGlass Fireguard Sheathing: www.gpgypsum.com/#sle.
 - d. National Gypsum Company; Gold Bond eXP Sheathing:
www.nationalgypsum.com/#sle.
 - e. USG Corporation: Securock Brand Glass Mat Sheathing.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 GYPSUM WALLBOARD ACCESSORIES

- A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3-1/2 inch.
 - 1. Application:
 - a. Partitions with STC Rating:
 - 1) Insulation fill at gypsum board partition stud framing.
 - 2) Surround penetrations in gypsum board partitions.
 - b. Gypsum board ceilings adjacent to sound-rated partitions.

2. Surface Burning Characteristics as per ASTM E84: Flame Spread of 10; Smoke Developed of 10.
3. Products:
 - a. Owens-Corning; Sound Attenuation Batts: www.owenscorning.com.
 - b. CertainTeed; "NoiseReducer" Sound Attenuation Batts: www.certainteed.com.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Sealants: For penetrations at fire-rated construction, provide firestopping as specified in Section 07 84 00 - Firestopping.
- C. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
 1. Non-staining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.
 2. Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following acoustical sealants for concealed joints:
 - a. Products:
 - 1) Franklin International, Inc; Titebond GREENchoice Professional Acoustical Smoke and Sound Sealant: www.titebond.com/#sle.
 - 2) Liquid Nails, a brand of PPG Architectural Coatings; _____: www.liquidnails.com/#sle.
 - 3) Ohio Sealants, Inc.; Pro-Series SC-170 Rubber Base Sound Sealant.
 - 4) Pecora Corp.; BA-98.
 - 5) Specified Technologies Inc; Smoke N Sound Acoustical Sealant: www.stifirestop.com/#sle.
 - 6) Tremco, Inc.; Tremco Acoustical Sealant.
 - 7) USG Corporation; USG Sheetrock Acoustical Sealant
 - 8) Substitutions: See Section 01 60 00 - Product Requirements.
- D. Acoustic Foam Tape: 2 inch wide by 1/4 inch thick neoprene foam gasket/sealing tape.
 1. SCE-41 Grade Neoprene sponge with a rubber based adhesive one side.
 2. Adhesive to utilize a white Kraft paper liner.
- E. Beads, Joint Accessories, and Other Trim: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
 1. Manufacturers - Finishing Accessories:
 - a. Flannery, Inc.: flannerytrim.com.
 - b. Fry Reglet: fryreglet.com.
 - c. Phillips Manufacturing Co: www.phillipsmfg.com.
 - d. Pittcon Industries: www.pittconinsutries.com
 - e. Trim-tex, Inc.: www.trim-tex.com.
 - f. CEMCO Products, Inc; www.cemco.com.
 - g. USG Corporation: www.usg.com
 - h. Substitutions: See Section 01 60 00 - Product Requirements.
 2. Corner Beads: Low profile, for 90 degree outside corners.

- a. Cornerbead: USG Sheetrock B1 XW EL, or equal.
 - b. L Trim: USG Paper-faced "L" trim, B4 or equal.
- F. Moisture Guard Trim: ASTM C1047, rigid plastic, 48 inch length, applied to bottom edge of gypsum board.
 - 1. Height: 1/2 inch.
 - 2. Depth: 1/2 inch.
 - 3. Products:
 - a. Waterguard USA; Waterguard: www.waterguard-usa.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 - 1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 - 2. Joint Compound: Drying type, vinyl-based, ready-mixed.
 - 3. Joint Compound: Setting type, field-mixed.
- H. Abuse Resistant Finishes:
 - 1. Acrylic, water-based, non-textured, high build, tintable primer and surfacer.
- I. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.
- J. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.
- K. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
- L. Adhesives
 - 1. Do not use adhesive containing benzene, carbon tetrachloride, or trichloroethylene.
 - a. Adhesive shall contain a maximum VOC content of 50 grams per liter.
 - b. Adhesive must meet the requirements of low emitting materials credit.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.
- B. Coordinate gypsum board Work with Work specified in other Sections to properly locate framing members and to provide additional framing and backing as necessary for recessed and built-in components.
 - 1. Verify that framing and furring are securely attached and of sizes and spacing to provide a suitable substrate to receive gypsum board.
 - 2. Maintain a minimum temperature of 50 degrees F for a period extending from 48 hours before installation until the joint compounds have completely dried.

- C. Examine substrates which gypsum board wall construction attaches to or abuts, including the following.
 - 1. Preset hollow metal frames
 - 2. Piping.
 - 3. Conduit.
 - 4. Ductwork.
- D. Beginning of installation means acceptance of substrate.
- E. Provide adequate and continuous ventilation to ensure proper drying, setting or curing of taping and finishing compounds. Provide temporary air circulators in enclosed areas lacking natural ventilation. GA-216, article 18.2.
- F. Provide fixtures, anchors, sleeves, inserts and miscellaneous items, and provide openings and chases as necessary. Prior to closing in and finishing of drywall Work, ascertain that piping, conduit, ductwork and fixtures which are to be concealed and which penetrate gypsum boards are in place, tested and approved.
- G. Scaffolding: Construct, erect and maintain in conformance with applicable laws and ordinances.
- H. Fire Protection: Where required, the Work shall comply with the requirements for the protection rating indicated in the governing building code.
- I. Fire Sprinkler System: In areas where sprinkler heads occur, exercise care when installing drywall work. Do not damage or obstruct the heads in any way.

3.02 SHAFT WALL INSTALLATION

- A. Verify compliance with requirements for installation tolerances and other conditions affecting performance of shaft wall construction. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
 - 1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches on center.
 - 2. Install studs at spacing required to meet performance requirements.
- C. Provisions at Expansion Joints: Do not bridge building expansion joints with shaft wall system, frame both sides of joints with furring and other support as indicated.
- D. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.
 - 1. On walls over sixteen feet high, screw-attach studs to runners top and bottom.
 - 2. Seal perimeter of shaft wall and penetrations with acoustical sealant at non-rated assemblies.
 - 3. Seal perimeter of shaft wall and penetrations with fire-rated sealant at fire-rated or smoke rated assemblies.
- E. Backing, Blocking and Bracing: Install supplementary framing, blocking and bracing to support gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings and similar

Work which cannot be adequately supported directly by regular framing of gypsum board shaft wall system.

1. Support elevator hoistway door frames independently of shaft wall framing system, or reinforce system in accordance with system manufacturer's instructions.
 2. Where handrails are indicated for direct attachment to gypsum board shaft wall system, provide not less than a 0.0341 inch thick by 4 inch wide galvanized steel reinforcement strip, accurately positioned and secured behind not less than one gypsum board face layer of 1/2 or 5/8 inch thickness.
- F. Installation Coordination with Steel Stairs: Integrate stair hanger rods with gypsum board shaft wall system where indicated (and where possible); by locating cavity of system as required to enclose rods.
- G. Shaft Wall Penetrations: At penetrations in shaft wall, maintain fire resistance rating of entire shaft wall assembly by installing supplementary fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items. See also Section 07 84 00 - Firestopping.
- H. Shaft Wall Structural Isolation: Isolate shaft wall system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading. Comply with details shown and with manufacturer's instructions.
- I. Perimeter Sealing: Seal gypsum board shaft walls at perimeter of each section which abuts other work and at joints and penetrations within each section. Install acoustical sealant to withstand dislocation by air pressure differential between shaft and external spaces; comply with manufacturer's instructions and ASTM C919.

3.03 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
1. Level ceiling system to a tolerance of 1/1200.
 2. Laterally brace entire suspension system.
 3. Install bracing as required at exterior locations to resist wind uplift.
- C. Studs: Space studs at 16 inches on center.
1. Extend partition framing to structure in all locations.
 2. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
1. Orientation: Vertical.

2. Spacing: As indicated.
- F. Furring for Fire-Resistance Ratings: Install as required for fire-resistance ratings indicated and to GA-600 requirements.
- G. Blocking: Install wood blocking (backing) for support of:
 1. Framed openings.
 2. Wall-mounted cabinets.
 3. Plumbing fixtures.
 4. Toilet partitions.
 5. Toilet accessories.
 6. Wall-mounted door hardware.
 7. Wall mounted equipment
 8. Wall mounted handrails
 9. Other locations, where indicated.
 10. Where sheet steel blocking(backing) is used on a wall with level 5 surface finish, provide shims between stud face and gypsum board panel to maintain a visually smooth level surface.

3.04 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
 1. Place one bead continuously on substrate before installation of perimeter framing members.
 2. Place continuous bead at perimeter of each layer of gypsum board.
 3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.
- C. Acoustic Tape: Place on top of all partition walls that do not project above suspended ceiling assemblies. Adhesive side shall be place on top of the wall.

3.05 BOARD INSTALLATION

- A. Regulatory Requirements: Install gypsum board products in accordance with applicable Code requirements and requirements of listed assemblies shown on Drawings.
- B. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- C. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
 1. Exception: Tapered edges to receive joint treatment at right angles to framing.
 2. In wood frame construction, erect panels horizontally only.

- D. Double-Layer, Nonrated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
- E. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
 - 1. Single Layer: Install and fasten gypsum board in accordance with CBC Title 24, Part 2, Table 721.1(2) for steel or wood construction. Install gypsum board vertically, with edges and ends occurring over firm bearing.
 - 2. Double Layer: Install and fasten gypsum board in accordance with CBC Title 24, Part 2, Table 721.1(2). Install base layer horizontally with ends occurring over firm bearing. Install face layer vertically with ends and edges occurring over firm bearing. Stagger joints 24 inches each side and opposite sides. Attach with required screws.
- F. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- G. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
 - 1. Seal joints, cut edges, and holes with water-resistant sealant.
- H. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.
- I. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated double-layer assemblies, which may be installed by means of adhesive lamination.
- J. Fastener Spacing: Space fasteners in accordance with reference standards and fire rating requirements of wall, partition, floor and ceiling assembly. Maximum spacing of 1-inch screws 8 inches on centers at vertical edges and 12 inches on centers in field and at top and bottom.

3.06 INSTALLATION OF TRIM AND ACCESSORIES

- A. Use longest practical lengths. Place corner beads at external corners. Place edge trim when gypsum board abuts dissimilar materials. Surfaces indicated to receive non-textured finish and semi-gloss enamels.
- B. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
- C. Corner Beads: Install at external corners, using longest practical lengths.
- D. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.
- E. Moisture Guard Trim: Install on bottom edge of gypsum board according to manufacturer's instructions and in locations indicated on drawings.

3.07 JOINT TREATMENT

- A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.

- B. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.
- C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 5: Walls and ceilings to receive, eggshell, semi-gloss or gloss paint finish and other areas specifically indicated. (Including High-Gloss thin wallcovering.)
 - 2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 - 3. Level 3: Walls to receive textured wall finish or heavy textured paint.
 - 4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 - 5. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.
 - 6. Level 0: Temporary partitions.
- D. Tape, fill, and sand all exposed joints, edges, and corners, including inside corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
 - 2. Tape shall be set over joint and seated into joint compound, leaving sufficient adhesive under tape to provide proper bond.
 - 3. Internal angles, both horizontal and vertical, shall be reinforced and with tape folded to form straight and true angle.
 - 4. Metal external corners shall be cemented in place.
 - 5. Joints shall be allowed to dry according to Gypsum Association Standards based on temperature and humidity. Allow for at least 24 hours between each application of joint compound.
 - 6. The final application of compound and sanding shall leave all surfaces uniformly smooth and in condition to receive specified finish.
 - 7. Taping, filling, and sanding are not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
 - 8. Taping, filling, and sanding are not required at base layer of double-layer applications.
- E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
- F. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.08 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.09 REPAIR, CLEAN-UP AND PROTECTION

- A. Repair fastener pops by driving a new fastener approximately 1-1/2 inches from the fastener pop and reset the popped fastener. When face paper is punctured, install a new fastener

approximately 1-1/2 inches from the defective fastener. Fill damaged surfaces with compound.

- B. Upon completion of the work, remove from adjacent surfaces, overspray, splatter and daubs of taping and finish compound and textured finishes. Remove tools, equipment, unused material and cuttings and leave the work in a clean orderly manner.

END OF SECTION

SECTION 09 22 36

LATH

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal lath for cement plaster.
- B. Furring for metal lath.
- C. Metal ceiling framing.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Sheathing on exterior walls.
- B. Section 07 25 00 - Weather Barriers: Weather barrier under exterior plaster and stucco.
- C. Section 08 31 00 - Access Doors and Panels: Product requirements for metal access panels integral with metal lath.
- D. Section 09 21 16 - Gypsum Board Assemblies: Sheathing on exterior walls.
- E. Section 09 24 00 - Cement Plastering.

1.03 REFERENCE STANDARDS

- A. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
- B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- C. ASTM C841 - Standard Specification for Installation of Interior Lathing and Furring.
- D. ASTM C847 - Standard Specification for Metal Lath.
- E. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
- F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- G. ASTM C1032 - Standard Specification for Woven Wire Plaster Base.
- H. ASTM C1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster.
- I. Plaster Assemblies Manual - Technical Information Services Bureau (TSIB) of Western Walls & Ceilings Contractors Association (WWCCA); Current Edition.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on furring and lathing components, structural characteristics, material limitations, and finish.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of each installation standard referenced on site throughout the duration of lathing and plastering work.
- B. Installer Qualifications: Company specializing in performing the work of this section with at least three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Lath: All products listed are "or equal".
 - 1. Brand X Metals: www.brandxmetals.com.
 - 2. CEMCO: www.cemcosteel.com/#sle.
 - 3. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com/#sle.
 - 4. Fry Reglet: www.fryreglet.com.
 - 5. Pittcon Industries: www.pittconindustries.com.
 - 6. Structa Wire Corporation; Structalath: www.structawire.com/#sle.
 - 7. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FRAMING AND LATH ASSEMBLIES

- A. Provide completed assemblies with the following characteristics:
 - 1. Maximum Deflection of Vertical Assemblies: 1:360 under lateral point load of 100 lbs.
 - 2. Maximum Deflection of Horizontal Assemblies: 1:240 deflection under dead loads and wind uplift.
- B. Fire Rated Assemblies: Provide components complying with requirements for fire rated assemblies specified in the section where the plaster finish is specified.

2.03 FRAMING MATERIALS

- A. Furring Channels: Formed steel, minimum 0.020 inch thick, 3/8 inch deep by 7/8 inch high, splicing permitted; galvanized.
- B. Main Ceiling Channels: Formed steel, asphalt coated, minimum 0.05 inch thick, 3/4 inch deep by 1-1/2 inch high, single piece, no splicing; galvanized.
- C. Hangers: Steel wire, of size and type to suit application, to support ceiling components in place to deflection limits as indicated.
- D. Ceiling Hangers: Rolled steel sections, of size and type to suit application, to rigidly support ceiling components in place to deflection limits as indicated; galvanized.
- E. Lateral Bracing: Formed steel, minimum 0.060 inch thick, size and length as required; galvanized.

2.04 LATH

- A. Diamond Mesh Metal Lath: ASTM C847, galvanized; self-furring.

1. Weight: To suit application, comply with deflection criteria, and as specified in ASTM C841 or ASTM C1063 for framing spacing.
 2. Minimum Weight: 3.4 lb/sq yd.
- B. Ribbed Metal Lath: ASTM C847, galvanized; 3/8 inch thick. For soffit use only.
1. Weight: To suit application _____ and as specified in ASTM C841 or ASTM C1063 for framing spacing.
 2. Minimum Weight: 3.4 lb/sq yd.
- C. Corner Mesh: Formed sheet steel, minimum 0.018 inch thick, perforated flanges shaped to permit complete embedding in plaster, minimum 2 inch size; same finish as lath.
- D. Strip Mesh: Expanded metal lath, same weight as lath, 2 inch wide by 24 inch long; same finish as lath.
- E. Beads, Screeds, Joint Accessories, and Other Trim: Depth governed by plaster thickness, maximum possible lengths.
1. Galvanized Steel Accessories:
 - a. Types specified below conforming to Technical Services Information Bureau of the Western Walls and Ceilings Contractors Association (WWCCA) "Plaster Assemblies Manual".
 - b. Where galvanized accessories are specified, use hot-dip galvanized steel, ASTM A653, designation G60.
 - c. Provide metal shapes, of longest possible length, used as grounds of such size and dimension as to provide for required plaster thickness.
 2. Material: Formed galvanized sheet steel, expanded metal flanges.
 3. Casing Beads with Weep Holes: Square edges.
 - a. Product: #66 Expanded Flange Casing Bead manufactured by Cemco.
 - b. Fabricated of 26 gage hot-dip galvanized steel. Provide beads with expanded metal flange and inverted vee at plaster edge of face flange.
 4. Corner Beads: Square-Edge corners.
 - a. Corner Reinforcement: Fabricated from expanded metal with large openings, from welded or woven copper bearing steel wire of minimum 28 gage, hot-dip galvanized, minimum 3 inches wide.
 - 1) Product: No. 2-A Corner Bead manufactured by Cemco.
 - 2) Product: No. 2-A Reinforced Flange Corner Bead manufactured by Cemco.
 - b. Cornerite: Expanded Metal, weighing 0.105 pounds per lineal foot, bent in center to form 105 degree angle, 6 inches wide (total).
 - 1) Product: Cornerite manufactured by Cemco.
 5. Base Screeds: Bevelled edges.
 - a. Foundation Weep Screeds: Perforated type.
 - 1) Product: No. 7 Foundation Sill Screed manufactured by Cemco.
 - 2) Product: No. 7 Extended Foundation Screed manufactured by Cemco. For locations where plaster is just above a paving surface.
 6. Drip Screeds: Fabricated from 0.018 inch thick; G-90 hot-dip galvanized steel.
 - a. Product: #12 Soffit Drip Edge manufactured by Cemco.

- b. Product: #6 Head Drip Screed manufactured by Cemco. For locations above other flashing such as door and window heads.
- 7. Window/Door Drips: Self weeping 26 gage hot-dip galvanized steel.
 - a. Product: No. 3 Flashing Screed manufactured by Cemco. For locations where plaster is offset 1-1/2 inches back from projection.
- 8. Soffit Vent:
 - a. Material: Extruded Aluminum ASTM B221 (ASTM B221M), 6063 alloy, T5 temper.
 - b. Size: As indicated on Drawings.
 - c. Finish: Clear Anodized.
 - d. Product: Soffit Vent PCS-75-V-400 (example for 4 inch size with 3-coat plaster) manufactured by Fry Reglet.
- 9. Strip Lath: Strip Reinforcement (Expanded Metal), weighing 2.5 lbs/sq.yd., 6 inches wide. Use hot-dip galvanized at all locations where galvanized metal lath occurs.
- 10. Control Joints: Accordion profile with factory-installed protective tape, 2 inch flanges.
 - a. Product: Double "V" Control Joint (#15) manufactured by Cemco.
 - b. Stress Relief Joints (Expansion and Control Joints): Stress Relief Control Joints, fabricated of 26 gage (0.0217 inch) hot-dip galvanized steel with G60 hot-dip galvanized coating.
 - 1) Recesses on control joints shall be covered with removable tape or filled with rope to prevent plaster from filling the recess.
- 11. Aluminum Accessories (Where Detailed):
 - a. Specified Manufacturer: Fry Reglet Corporation; www.fryreglet.com.
 - b. Acceptable Manufacturers:
 - 1) Interior Specialties Division, Gordon, Inc.; www.gordon-inc.com.
 - 2) Substitutions: See Section 01 60 00 - Product Requirements.
 - c. Casing Beads: Fry Reglet, F-shaped aluminum, FPM-75-75, 3/4 inch reveal or Fry J-Molding JPM-75 as detailed.
 - d. Control Joints: Fry Reglet, Channel Screed, PCS-75-50, 1/2 inch wide reveal or as detailed on Drawings.
 - e. All intersections factory fabricated with joints heliarc welded and backs sealed with permanent waterproof tape. Provide connector clips and sealant at butt joints of straight sections.
 - f. Aluminum Finish:
 - 1) Clear anodized.
 - g. Fasteners: 1-1/4 inch long S-12 pancake head, USG, Buildex Division of Illinois Tool Works or equal.

2.05 ACCESSORIES

- A. Access Panels: As specified in Section 08 31 00.
- B. Anchorage: Tie wire, nails, and other metal supports, of type and size to suit application; to rigidly secure materials in place, galvanized per ASTM C1063.
 - 1. At Vertical Surfaces:
 - a. Tie Wire: 18 gage.

2. At Horizontal Surfaces:
 - a. Tie Wire: 18 gage, double strand.
- C. Fasteners: Self-piercing tapping screws; ASTM C1002 or ASTM C954.
 1. At Vertical Surfaces:
 - a. Screws: Self-drilling TEKS for metal stud attachment.
 2. At Horizontal Surfaces:
 - a. Screws: Self-drilling TEKS for metal stud attachment.
- D. Tie Wire: Annealed galvanized steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that substrates are ready to receive work and conditions are suitable for application.
- C. For exterior plaster and stucco on stud walls, verify that water-resistive barrier has been installed over sheathing substrate completely and correctly.
 1. Do not allow the control or expansion joints to interrupt or be lapped with the weather barrier.
- D. Do not begin until unacceptable conditions have been corrected.
- E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION - GENERAL

- A. Install interior lath and furring for gypsum plaster in accordance with ASTM C841.
- B. Install metal lath and furring for Portland cement plaster in accordance with ASTM C1063.
- C. Install lath and furring for fire-rated assemblies in accordance with requirements of assembly as indicated.

3.03 CEILING AND SOFFIT FRAMING INSTALLATION

- A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
- B. Install furring independent of walls, columns, and above-ceiling work.
- C. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.
- D. Space main carrying channels at maximum 72 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.
- E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
- F. Install furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.

- G. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches past each opening.
- H. Laterally brace suspension system.

3.04 CONTROL AND EXPANSION JOINT INSTALLATION

- A. At unsheathed open framing, provide double stud construction behind control joint.
- B. Locate joints as indicated on drawings and comply with ASTM C1063.
 - 1. Area of plaster panel not to exceed 144 sq ft for vertical surfaces.
 - a. Expansion Joint Spacing: 36 feet on center and as indicated on drawings.
 - 2. Area of plaster panel not to exceed 100 sq ft for horizontal, curved or angled surfaces.
 - 3. Spacing between control joints not to exceed 18 ft in each direction.
 - a. Narrow panels should not exceed 12 feet in length.
 - 4. Area bounded by control joints not to exceed a length-to-width ratio of 2-1/2 to 1.
 - 5. Vertical control joints should pass through horizontal control joints. Vertical control joints must terminate at horizontal expansion joints.
 - 6. Joint Placement: Approved by Architect before plastering.
- C. Install expansion joints where an expansion joint occurs in base exterior wall.
- D. Install prefabricated joint accessories in accordance with ASTM C1063.
 - 1. Install factory-made joints at reveal-to-reveal and reveal-to-control joint intersections.
- E. Discontinue metal lath at joint and apply 12 inch wide strip of flexible flashing behind each joint
- F. Hold casing beads back 3/8 to 1/4 inch from abutting frames and other elements to provide joint for sealant.
- G. Apply sealant at splices, intersections and terminals in accordance with Section 07 92 00 - Joint Sealants.

3.05 ACCESS PANELS INSTALLATION

- A. Install access panels and rigidly secure in place.
- B. Install frames plumb and level in opening. Secure rigidly in place.
- C. Position to provide convenient access to concealed work requiring access.

3.06 LATH INSTALLATION

- A. Apply lath taut, with long dimension perpendicular to supports.
- B. Lath shall not be continuous through control or expansion joints.
- C. Apply ribbed lath with self-furring ribs perpendicular to supports at soffits and horizontal surfaces.
 - 1. Lap sides of ribbed lath minimum 1-1/2 inches.
 - 2. Nest outside ribs of rib lath together.
 - 3. Attach lath to supports using specified screws at maximum 6 inches on center vertical and 16 inches on center horizontal.

4. At horizontal metal lath application, secure lath to each support with specified screws.
- D. Expanded metal lath at vertical supports, apply self-furring "grooved" metal lath with self-furring rib perpendicular to supports.
 1. Install per Table 2507.2 California Building Code.
 2. Installation shall maintain lath 1/4 inch away from vertical supports.
- E. Attach metal lath to supports using screws at maximum 12 inches on center.
- F. Attach horizontal metal lath to metal supports using tie wire at maximum 6 inches on center vertical.
- G. Continuously reinforce internal angles with corner mesh, except where the metal lath returns 3 inches from corner to form the angle reinforcement; fasten at perimeter edges only.
- H. Place corner bead with mesh at external wall corners; fasten at outer edges of lath only.
- I. Place strip lath diagonally at corners of lathed openings. Secure rigidly in place.
- J. Place strip lath centered over junctions of dissimilar backing materials on same plane. Secure rigidly in place.
- K. Place base screeds at termination of plaster areas; secure rigidly in place.
 1. Install weep screeds at foundation. Install minimum 4 inches above earth or 2 inches above paved areas.
 2. To allow moisture to escape from a portland cement plaster (stucco) assembly, no sealant shall be placed at the bottom of the plaster termination.
- L. Place 4 inch wide strips of lath centered over junctions of dissimilar backing materials, and secure rigidly in place.
- M. Place lath vertically above each top corner and each side of door frames to 6 inches above ceiling line.
- N. Place casing beads at terminations of plaster finish. Butt and align ends, cope or miter at corners. Secure rigidly in place, maximum 12 inches on centers..
- O. Place additional strip mesh diagonally at corners of lathed openings. Secure rigidly in place.

3.07 FIELD QUALITY CONTROL

- A. Inspection: Notify Architect minimum 2 days prior to scratch coat for inspection of all in-place lath and accessories.

3.08 TOLERANCES

- A. Install accessories to lines and levels.
- B. Maximum Variation from True Lines and Levels: 1/8 inch in 10 feet.
- C. Maximum Variation from True Position: 1/8 inch.

END OF SECTION

SECTION 09 24 00
CEMENT PLASTERING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cement plastering. CPL-1, CPL-2, CPL-3

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood stud framing for plaster.
- B. Section 07 25 00 - Weather Barriers: Weather barrier under exterior plaster.
- C. Section 08 31 00 - Access Doors and Panels: Access panels.
- D. Section 09 21 16 - Gypsum Board Assemblies: Gypsum Sheathing: Solid backing at all exterior plaster.
- E. Section 09 22 36 - Lath: Lath, furring, beads, screeds, and joint accessories for plaster base.
- F. Section 09 91 13 - Exterior Painting: Finish paint over integral color plaster.

1.03 REFERENCE STANDARDS

- A. ASTM C150/C150M - Standard Specification for Portland Cement.
- B. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes.
- C. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster.
- D. ASTM C932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.
- E. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- F. CBC - California Building Code.
- G. TSIB (PAM) - Plaster Assemblies Manual, Technical Services Information Bureau.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide data on plaster materials and trim accessories.
- C. Evaluation Service Reports: Show compliance with specified requirements.
- D. Samples:
 - 1. Submit two samples, 8 by 8 inch in size illustrating finish color and texture.
 - 2. Submit two samples of each type trim accessory.
- E. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
- B. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.06 MOCK-UP

- A. Mock-Up Panel: Construct a 4 foot wide by 8 foot high sample panel of plaster work at the jobsite demonstrating installation procedures, finish texture, and color. Show each phase of installation including framing and reinforcement.
- B. After color and texture samples have been approved and returned, construct a mock-up not less than as noted above in size, of each texture type, in location approved by Architect.
 - 1. Use workmen, equipment and techniques proposed for use on the project.
 - 2. The panel may be constructed as a portion of the finished work, provided the approved panel is clearly identified for future reference.
 - 3. The approved panel shall become the standard of comparison for cement plaster work for the project.
 - 4. If mock-up is not a part of building construction, it must be removed when directed by Architect after completion of project.

1.07 FIELD CONDITIONS

- A. Exterior Plaster Work: Do not apply plaster when substrate or ambient air temperature is 40 degrees F or lower, or when temperature is expected to drop below 40 degrees F within 48 hours of application.

PART 2 PRODUCTS

2.01 CEMENT PLASTER APPLICATIONS

- A. Lath Plaster Base: Metal lath.
 - 1. Plaster Type: Factory prepared plaster mix.
 - 2. Number of Coats: Three.
 - 3. First Coat: Apply to a nominal thickness of 3/8 inch.
 - 4. Second Coat: Apply to a nominal thickness of 3/8 inch.
 - 5. Leveling Coat: Apply to a nominal thickness of 1/32 to 1/16 inch.
 - 6. Finish: Acrylic.

2.02 FACTORY PREPARED CEMENT PLASTER

- A. Fire-Resistance Rating: Determined in accordance with test procedures in ASTM E119 and complying with the following:
 - 1. CBC, Section 2504.2.1 Wood furring strips (DSA & OSHPD 1& 4), 2507 Lathing and Plastering, 2511 Interior Plaster, and 2512 Exterior Plaster.
- B. Exterior Portland cement plaster system made of scratch and brown base coat, leveling coat with reinforcing mesh, and acrylic finish coat; install in accordance with ASTM C926.
 - 1. Provide continuous exterior insulation, with drainage grooves, as part of the system, by the same manufacturer.
 - a. See Technical Bulletin 60.110, TSIB (PAM).
 - 2. Provide weather resistive barrier as part of the system.

3. Manufacturer - Basis of Design:
 - a. Omega Products International, Inc.; Super Cement with Crack Isolation System: omega-products.com.
4. Other Acceptable Manufacturers:
 - a. BASF Wall Systems: www.wallsystems.basf.com/#sle.
 - b. Dryvit; Commercial Cement Plaster (CCP) 4: www.dryvit.com.
 - c. LaHabra; FastWall 300: www.lahabrastucco.com/#sle.
 - d. Omega Products International, Inc.; Super Cement with Crack Isolation System: omega-products.com.
 - e. Parex USA, Inc; Armourwall 300: www.parexusa.com/#sle.
 - f. Sto Corp; Sto Powerwall: www.stocorp.com/#sle.
 - g. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Premixed One-Coat Base: Mixture of Type I Portland cement complying with ASTM C150/C150M, hydrated lime complying with ASTM C207, fibers and other approved ingredients; install in accordance with ASTM C926.
 1. Manufacturers:
 - a. Omega Products International, Inc.; Diamond Wall Insulating One Coat System: omega-products.com.
- D. Premixed Base Coats: Mixture of cement, aggregate, fibers, and proprietary admixtures for scratch and brown coats; install in accordance with ASTM C926.
- E. Premixed Leveling Coat: Acrylic polymer-based blend approved for use with plaster manufacturer's base coat and finish materials.
- F. Primer: Acrylic, as recommended by coating manufacturer and compatible with plaster base coat.
- G. Premixed Textured Coating: Polymer modified acrylic coating, integrally colored, and trowel applied to substrates prepared in accordance with manufacturer's written installation instructions.

2.03 ACCESSORIES

- A. Lath: As specified in Section 09 22 36.
- B. Beads, Screeds, and Joint Accessories: As specified in Section 09 22 36.
- C. Bonding Compound: Provide type recommended for bonding plaster to solid surfaces, complying with ASTM C932.
- D. Reinforcing Mesh: 4.5 oz/sq yd alkali-resistant mesh.
- E. Water Resistive Barrier: As specified in Section 07 25 00.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions are acceptable prior to starting this work.
- B. Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are properly in place.

- C. Verify mechanical and electrical equipment and services located within areas to receive this work have been properly tested and approved.

3.02 PREPARATION

- A. Roughen smooth concrete surfaces and apply bonding compound in accordance with manufacturer's written installation instructions.

3.03 MIXING

- A. Mix only as much plaster as can be used prior to initial set.
- B. Mix materials dry, to uniform color and consistency, before adding water.
- C. Protect mixtures from frost or freezing temperatures, contamination, and excessive evaporation.

3.04 APPLICATION

- A. Apply plaster in accordance with manufacturer's written instructions and comply with ASTM C926.
- B. Base Coats:
 - 1. Apply base coat(s) to fully embed lath and to specified thickness.
 - 2. Follow guidelines in ASTM C926 and manufacturer's written installation instructions for moist curing base coats and application of subsequent coats.
- C. Leveling Coat:
 - 1. Apply leveling coat to specified thickness.
 - 2. Fully embed reinforcing mesh in leveling coat.
- D. Finish Coats:
 - 1. Cement Plaster:
 - a. Apply with sufficient material and pressure to ensure complete coverage of base to specified thickness.
 - b. Apply desired surface texture while mix is still workable.
 - c. Float to a consistent finish.
 - 2. Primer and Acrylic Coatings:
 - a. Remove surface contaminants such as dust and dirt without damaging substrate.
 - b. Apply primer in accordance with manufacturer's instructions.
 - c. Apply finish coating in number of coats and to thickness recommended by manufacturer.
 - d. Finish coat to match existing texture.
 - 3. Acrylic Finish Texture: Apply to a consistent finish.
 - a. TSIB (PAM) Fine Sand.
- E. Finish Painting Overcoat: See Section 09 91 13 - Exterior Painting.

3.05 TOLERANCES

- A. Maximum Variation from True Flatness: 1/4 inch in 10 feet.

3.06 REPAIR

- A. Patching: Remove loose, damaged or defective plaster and replace with plaster of same composition; finish to match surrounding area.

END OF SECTION

SECTION 09 51 00
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Acoustical units. ACT-1

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 08 31 00 - Access Doors and Panels: Access panels.
- C. Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC) - Air Outlets and Inlets: Air diffusion devices in ceiling.
- D. Division 26 - Electrical - Interior Lighting: Light fixtures in ceiling system.
- E. Division 27 - Communications - Public Address Systems: Speakers in ceiling system.

1.03 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.
- D. CHPS (HPPD) - High Performance Products Database.
- E. UL (GGG) - GREENGUARD Gold Certified Products.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on suspension system components and acoustical units.
- C. Samples: Submit two samples 12 by 12 inch in size illustrating material and finish of acoustical units.
- D. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acoustic Tiles/Panels:
 - 1. Armstrong World Industries, Inc: www.armstrong.com/#sle.
 - a. Local contacts Dai-Nee Tan 949-275-8169 or Tim Traber 760-473-1108.
 - 2. CertainTeed Corporation: www.certainteed.com/#sle.
 - 3. USG Corporation: www.usg.com/#sle.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Flame Spread Rating: Provide acoustical ceiling units bearing the label of Underwriters' Laboratories, or other testing agency acceptable to the State Fire Marshal, indicating that the units provide the specified flame spread rating.
 - 1. Class A Flame spread rating 0-15, smoke developed 0-15 per ASTM E84 for each acoustical tile type.
- B. Seismic Performance: Ceiling systems designed to withstand the effects of earthquake motions determined according to ASCE 7 for Seismic Design Category D, E, or F and complying with the following:
 - 1. Local authorities having jurisdiction.
 - 2. ICC-ES Evaluation Report No. ESR-1308.
 - 3. Seismic Requirements: Furnish and install suspension systems in accordance with the suspension system manufacturer's current ICC Evaluation Service Report; the California Building Code (CBC), Title 24 Part 2, Section 1617A.1.21; CBC Title 24 Part 2, Chapter 25.
 - a. Include the following Interpretation of Regulations, issued by the Division of the State Architect (DSA).
 - 1) IR A-5: Acceptance of Products, Materials, and Evaluation Reports; Revised 1/27/17.
 - 2) IR 16-9: Pendant Luminaires; Revised 9/14/20.
 - 3) IR 25-2.13: Metal Suspension Systems for Lay-In Panel Ceilings; Revised 11/9/17.
 - 4) IR 25-1: Maximum Allowable Load for Ceiling Wires; Revised 7/1/20.

2.03 ACOUSTICAL UNITS

- A. Acoustical Units - General: ASTM E1264, Class A.
 - 1. VOC Content: Certified as Low Emission by one of the following:
 - a. Product listing in UL (GGG).
 - b. Product listing in CHPS (HPPD).

- B. Acoustical Panels, Type ACT-1: Painted mineral fiber, with the following characteristics:
 - 1. Classification: ASTM E1264 Type III.
 - a. Form: 2, water felted.
 - b. Pattern: "C" - perforated, small holes.
 - 2. Size: 24 by 48 inch.
 - 3. Thickness: 3/4 inch.
 - 4. Light Reflectance: 85 percent, determined in accordance with ASTM E1264.
 - 5. NRC Range: 0.70, determined in accordance with ASTM E1264.
 - 6. Ceiling Attenuation Class (CAC): 40, determined in accordance with ASTM E1264.
 - 7. Panel Edge: Square.
 - 8. Suspension System: Exposed grid.
 - 9. Basis of Design Product: School Zone Fine Fissured No. 1714 as manufactured by Armstrong World Industries, or equal.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 PREPARATION

- A. Install after major above-ceiling work is complete.
 - 1. Complete and obtain approval of mechanical, electrical and other work above the ceiling line, before start of acoustical ceiling installation.
- B. Coordinate the location of hangers with other work.

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- E. Cutting Acoustical Units:
 - 1. Cut to fit irregular grid and perimeter edge trim.
 - 2. Make field cut edges of same profile as factory edges.
 - 3. Double cut and field paint exposed reveal edges.
- F. Install hold-down clips on panels within 20 ft of an exterior door.

3.04 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.05 ADJUSTING AND CLEANING

- A. Replace loose and damaged tile and panels when directed.
- B. Touch-up all damaged finish.
- C. Leave all surfaces clean and free from markings and other disfigurements.
- D. Remove all debris resulting from the work of this section.

END OF SECTION

SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient tile flooring. LVT-1, LVT-2, LVT-3, VCT-1
- B. Resilient base. RB-1
- C. Installation accessories.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.
- D. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.
 - 1. Remedial Floor coating is required under all resilient flooring.

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- C. ASTM F150 - Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring.
- D. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile.
- E. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile.
- F. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- G. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Shop Drawings: Indicate seaming plans and floor patterns.
- D. Verification Samples: Submit two samples, 2 by 2 inch in size illustrating color and pattern for each resilient flooring product specified.
- E. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

- F. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.
- G. Manufacturer's Qualification Statement.
- H. Installer's Qualification Statement.
- I. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- J. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Flooring Material: 100 square feet of each type and color.
 - 3. Extra Wall Base: 50 linear feet of each type and color.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.
- C. Testing Agency Qualifications: Independent firm specializing in performing concrete slab moisture testing and inspections of the type specified in this section.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

1.07 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Provide products complying with the most stringent requirements of local, state, and federal regulations; where requirements of the contract documents exceed those of regulations, comply with the contract documents.
- B. Requirements for Physically Disabled: Provide flooring meeting slip-resistant requirements of California Code of Regulations (CCR), Title 24, Part 2, Chapter 11B and ADA Standards, latest amendment.
 - 1. Flooring surface shall be stable, firm, and slip resistant. CBC Section 11B-302.1 General.
 - 2. Flooring surface shall demonstrate a dynamic coefficient of friction of at least 0.42 per DCOF AcuTest ANSI 137.1 Section 9.6 and ANSI B101.3 (using a BOT-3000 testing unit)

will be accepted as meeting the intent of slip resistance; CBC 11B-302 Floor or Ground Surfaces and ADA Standards.

- a. Ramp surface: Provide DCOF value of 0.46.
- C. Comply with CalGreen Building Standards: 80 percent of the installed resilient flooring shall meet one of the following:
 1. VOC Content: Certified as Low Emission by one of the following :
 - a. SCS Floorscore; www.scs-certified.com. CalGreen 5.504.4.6.1.
 - b. Compliant with the VOC emission limits and testing requirements specified in the California Department of Public Health's 2010 "Standard Method for the Testing and Evaluation Chambers", Version 1.1, February 2010. CalGreen 5.504.4.6.2.
 - c. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; www.chps.net/manual/lem_table.htm. CalGreen 5.504.4.6.3.
 - d. Products certified under UL GreenGuard Gold; www.greenguard.org. CalGreen 5.504.4.6.4.

2.02 TILE FLOORING

- A. Vinyl Composition Tile - Type VCT-1: Homogeneous, with color extending throughout thickness.
 1. Manufacturers:
 - a. Armstrong Flooring, Inc; Standard Execelon Imperial Texture: www.armstrongflooring.com/#sle.
 - b. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
 2. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
 3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
 4. Size: 12 by 12 inch.
 5. VOC Content Limits: As specified in Section 01 61 16.
 6. Thickness: 0.125 inch.
 7. Color: As indicated on drawings.
- B. (LVT) Luxury Vinyl Tile: Printed film type, with transparent or translucent wear layer.
 1. Manufacturers:
 - a. LVT-1, LVT-3 - Armstrong Flooring Inc; Natural Creations with Diamond 10 Technology Mystix: www.armstrong.com/#sle.
 - b. LVT-2 Patcraft; i600v, Click Refresh: www.patcraft.com.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.
 2. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.

3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
4. VOC Content Limits: As specified in Section 01 61 16.
5. NSF 332 Certification: Gold level.
6. Size: As indicated on Drawings.
7. Wear Layer Thickness: 0.020 inch.
8. Total Thickness: 0.125 inch.
9. Color: As indicated on drawings.

2.03 RESILIENT BASE

- A. Resilient Base - Type RB-1: ASTM F1861, Type TS rubber, vulcanized thermoset; Style B, Cove.
 1. Manufacturers:
 - a. Armstrong; Wall Base: www.armstrongflooring.com.
 - b. Burke Flooring: www.burkeflooring.com/#sle.
 - c. Johnsonite, a Tarkett Company: www.johnsonite.com.
 - d. Roppe Corporation: www.roppe.com/#sle.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.
 2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
 3. Height: 4 inch.
 4. Thickness: 0.125 inch.
 5. Finish: Satin.
 6. Length: Roll.
 7. Color: As indicated on drawings.
 8. Accessories: Premolded external corners and internal corners.

2.04 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
 1. VOC Content Limits: As specified in Section 01 61 16.
- C. Moldings, Transition and Edge Strips: Same material as flooring.
- D. Filler for Coved Base: Plastic.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

- B. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
 - 1. Test in accordance with Section 09 05 61.
 - 2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- C. Environmental Condition: Comply with flooring manufacturer's instructions and recommendations.
 - 1. Verify that ambient and surface temperatures and humidity conditions are in compliance.
- D. Verify that required floor-mounted utilities are in correct location.
- E. Material Inspection:
 - 1. In accordance with manufacturer's installation requirements, visually inspect materials prior to installation.
 - 2. Material with visual defects shall not be installed.
 - 3. Labor costs required to replace material installed with visual defects shall be the responsibility of the installation contractor.

3.02 PREPARATION

- A. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.
- B. Clean substrate.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of sub-floor conditions. Beginning of installation means acceptance of existing substrate and site conditions and assumes responsibility for correcting unsuitable conditions at no additional cost to the District.
- B. Install in accordance with manufacturer's written instructions.
 - 1. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions for installation.
- C. Adhesive-Applied Installation:
 - 1. Spread only enough adhesive to permit installation of materials before initial set.
 - 2. Fit joints and butt seams tightly.
 - 3. Set flooring in place, press with heavy roller to attain full adhesion.
- D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- E. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- F. Install feature strips where indicated.

3.04 INSTALLATION - TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.
- B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.

3.05 INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.06 FIELD QUALITY REQUIREMENTS

- A. Manufacturer's Field Services: Upon District's request and with at least 72 hours notice, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions.

3.07 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.
- C. Installation Clean-Up: Upon completion of installation in a room or area, clean flooring and adjacent surfaces.
 - 1. Sweep or vacuum floor thoroughly.
 - 2. Do not wash floor until time period recommended by resilient flooring manufacturer has elapsed to allow resilient flooring to become well-sealed in adhesive.
 - 3. Remove excess adhesive or other surface blemishes, using appropriate cleaner recommended by resilient flooring manufacturers.
- D. Initial Cleaning: After adhesive has set but no sooner than 5 days after installation, wash resilient tile flooring with a neutral type cleaning solution in accordance with manufacturer's instructions and recommendations. Rinse thoroughly with clear, cool water but do not flood floor.
 - 1. After completion of installation, apply one coat of polish, if recommended by manufacturer, and buff to even luster.
 - 2. After final cleaning, apply second coat of polish as recommended by tile manufacturer and buff to even luster.
- E. Final Cleaning: Thoroughly clean resilient tile flooring and accessories in accordance with final cleaning specified in Section 01 70 00 - Execution and Closeout Requirements.
 - 1. Clean resilient flooring not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of Project.
 - 2. Clean resilient flooring by method recommended by resilient flooring manufacturer, including stripping and application of additional floor polish and buffing to even luster.

3.08 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.
- B. From the time of laying until Acceptance, protect flooring from damage.
 - 1. Lay reinforced kraft paper runners and provide barricades and signs as necessary to prevent construction traffic on completed installations.
 - 2. Protect resilient flooring against damage from rolling loads for initial period following installation by covering with plywood or hardboard. Use dollies to move stationary equipment or furnishings across floors.
 - 3. Remove and replace defects which develop such as damaged, loose or broken tile and resilient accessories.

END OF SECTION

SECTION 09 68 13
TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Carpet tile, fully adhered. CPT-1
- B. Removal of existing carpet/tile.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 74 19 - Construction Waste Management and Disposal: Reclamation/Recycling of new carpet tile scrap and removed carpet tile.
- C. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.
- D. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.
- E. Section 09 6500 - Resilient Flooring: Topset Base.

1.03 REFERENCE STANDARDS

- A. AATCC Test Method 134 - Electrostatic Propensity of Carpets.
- B. AATCC Test Method 16 - Colorfastness to Light.
- C. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
- D. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- E. CRI 104 - Standard for Installation of Commercial Carpet.
- F. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Shop Drawings: Indicate layout of joints.
- D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- E. Submit two, 6 inch long samples of edge strip and base cap.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
- H. Manufacturer's Qualification Statement.

- I. Installer's Qualification Statement.
- J. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- K. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.06 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.
 - 1. Store inside, in well ventilated area, protected from weather, moisture and soiling. Store rolls flat, not standing on end.
- B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.
- C. Deliver carpet materials in original mill protective wrapping with mill register numbers and tags attached.
- D. Ventilate installation area during installation and for 72 hours after installation.

1.07 WARRANTY

- A. Carpet Warranty: Provide 10-year Commercial Limited Warranty.
- B. Extended Warranty: Provide extended warranty covering edge raveling, delamination and wear exceeding 10 percent of face yarn weight for a period of 15 years after "Notice of Completion".

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. All products used for flooring installation shall comply with flammability and smoke classifications for various locations of installation. Comply with applicable requirements of California Building Code (CBC) Chapter 8.
- B. Provide glue-down installation conforming to CBC Section 11B-302.2.
 - 1. Carpet shall be securely attached and shall have a firm cushion. pad, or backing or no cushion or pad.
 - a. Carpet shall have level loop, textured loop, level cut or level cut/uncut pile texture.
 - b. Pile height shall be 1/2 inch maximum.

2. Exposed edges shall be fastened to floor surfaces and shall have trim on the entire length.
 - a. Carpet edges shall comply with CBC Section 11B-303.
- C. Comply with CalGreen Building Standards: All installed carpeting shall be low VOC emissions listed. Certified as Low Emission by one of the following:
 1. Carpet and Rug Institute's Green Label Plus Program. CalGreen 5.504.4.4.1
 2. Compliant with the VOC emission limits and testing requirements specified in the California Department of Public Health's "Standard Method for the Testing and Evaluation Chambers", Version 1.1, February 2010 or Specification 01350. CalGreen 5.504.4.4.2.
 3. NSF/ANSI 140 at Gold level or higher. CalGreen 5.504.4.4.3
 4. SCS Floorscore; www.scs-certified.com. CalGreen 5.504.4.4.4.
 5. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and EQ 7.1 (formerly EQ 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; www.chps.net/manual/lem_table.htm. CalGreen 5.504.4.4.5.

2.02 MANUFACTURERS

- A. Tile Carpeting:
 1. Tandus: www.tandus.com.
 2. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 MATERIALS

- A. Tile Carpeting, Type CPT-1: Tufted, Textured Loop, manufactured in one color dye lot.
 1. Product: Sqareup Modular #04990 manufactured by Tarkett.
 2. Tile Size: 24 by 24 inch, nominal.
 3. Thickness: 0.35 inch.
 4. Color: As indicated on Drawings.
 5. Critical Radiant Flux: Minimum of 0.45 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
 6. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
 7. VOC Content: Comply with Section 01 61 16.
 8. Indoor Air Quality—CRI Green Label Plus™
 9. Maximum Electrostatic Charge: 3.5 Kv. at 20 percent relative humidity, AATCC Test Method 134.
 10. Light Fastness: ≥ 4.0 at 80 Hours, AATCC Test Method 16.

2.04 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Edge Strips: Rubber, color as selected by Architect.

- C. Adhesives:
 - 1. Compatible with materials being adhered; maximum VOC content as specified in Section 01 61 16.
- D. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.
 - 1. Water-resistant, non-staining and nonflammable type as recommended by carpet manufacturer to be compatible with backing materials.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
 - 1. Maximum variation of 1/8-inch in 10 ft
- B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
 - 1. Test in accordance with Section 09 05 61.
 - 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
 - 3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.
- D. Carpet Verification: Verify carpet match before cutting or placement to ensure minimal variation between dye lots.
- E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Remove existing carpet tile.
- B. Prepare floor substrates for installation of flooring in accordance with Section 09 05 61.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions and CRI 104 (Commercial).
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
 - 1. Locate change of color or pattern between rooms under door centerline.
- F. Locate change of color or pattern between rooms under door centerline.
- G. Fully adhere carpet tile to substrate.
- H. Trim carpet tile neatly at walls and around interruptions.

1. Edges: Run carpet under open bottom items and all cabinets and install tight to walls. Neatly trim and secure edge of carpet adjacent to door jambs where no base occurs.
- I. Complete installation of edge strips, concealing exposed edges.
- J. Carpet Finishing: Brush all seams and trim protruding pile tufts level. Remove excess adhesive on the carpet surface and thoroughly vacuum entire area. Leave room clean and ready for use.

3.04 PROTECTION

- A. Cover carpet during construction period with reinforced kraft paper when construction traffic is required to cross carpeted areas.
- B. Remove and replace damaged or improperly installed carpet.

3.05 CLEANING

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.
 1. Vacuum and remove all stains from carpet to satisfaction of District and in accordance with cleaning specified in Section 01 70 00 - Execution and Closeout Requirements.

END OF SECTION

SECTION 09 91 13
EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
 - 1. Exposed surfaces of steel lintels and ledge angles.
 - 2. Mechanical and Electrical:
 - a. On the roof and outdoors, paint equipment that is exposed to weather or to view, including factory-finished materials.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Non-metallic roofing and flashing.
 - 6. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, zinc, and lead.
 - 7. Floors, unless specifically indicated.
 - 8. Brick, Architectural concrete, and Cast stone.
 - 9. Glass.
 - 10. Concrete masonry units in utility, mechanical, and electrical spaces.
 - 11. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 05 50 00 - Metal Fabrications: Shop-primed items.
- C. Section 09 91 23 - Interior Painting.

1.03 DEFINITIONS

- A. Comply with ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency.

- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
- C. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board.
- D. SCAQMD 1113 - Architectural Coatings.
- E. SSPC-SP 1 - Solvent Cleaning.
- F. SSPC-SP 2 - Hand Tool Cleaning.
- G. SSPC-SP 6 - Commercial Blast Cleaning.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
 - 4. Manufacturer's installation instructions.
 - 5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.
- F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.
- G. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
 - 3. Label each container with color in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years documented experience and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Minimum Application Temperatures for Latex Paints: 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
 - 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
 - 2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.
- B. Paints:
 - 1. Behr Process Corporation: www.behr.com/#sle.
 - a. Local representative Jan Piccola 714.679.5730.
 - 2. Dunn-Edwards Corporation: www.dunnedwards.com,
 - a. Local representative Wanda Barragan 909.261.1289.
 - 3. PPG Paints: www.ppgpaints.com/#sle.
 - 4. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 - a. Local representative John Dumesnil 619.665.9341.
 - 5. Vista Paint: www.vistapaint.com.
 - a. Local representative Mark Brower 323.397.9000.

- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
 - 4. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16.
- C. Volatile Organic Compound (VOC) Content:
 - 1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. SCAQMD 1113 Rule.
 - c. CARB (SCM).
 - d. Architectural coatings VOC limits of California.
 - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- D. Flammability: Comply with applicable code for surface burning characteristics.
- E. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- F. Colors: As indicated on drawings.
 - 1. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including concrete masonry units and primed metal.
 - 1. One or two coats to cover and one coat primer.
 - 2. Top Coat(s): Exterior Latex.
 - 3. Top Coat Sheen:

- a. Flat: MPI gloss level 1; use this sheen at all locations.
 - b. Semi-Gloss: MPI gloss level 5; use this sheen at trim.
- 4. Primer: As recommended by top coat manufacturer for specific substrate.
- B. Masonry/Concrete and CMU Opaque, Latex, 3 Coat:
 - 1. One coat of latex primer sealer.
 - 2. Low-Sheen-Elastomeric: Two coats of latex-acrylic.
 - 3. Premium Flat: Two coats of latex-acrylic enamel.
- C. Exterior Plaster, Opaque, 100% Acrylic Latex, 3 Coat:
 - 1. One coat of latex primer sealer.
 - 2. Flat: Two coats of latex.
- D. Ferrous Metals, Unprimed, Latex, 3 Coat:
 - 1. One coat of latex primer.
- E. Ferrous Metals, Primed, Latex, 2 Coat:
 - 1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
- F. Ferrous Metals, Unprimed, High-Performance, 3 Coat:
 - 1. Pre-Treatment: As recommended by manufacturer
 - 2. One coat galvanize primer.
 - 3. Gloss: Two coats of alkyd enamel.

2.04 PRIMERS

- A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
 - 1. Alkali Resistant Water Based Primer.
 - 2. Interior/Exterior Latex Block Filler.
 - 3. Anti-Corrosive Alkyd Primer for Metal.
 - 4. Interior/Exterior Quick Dry Alkyd Primer for Metal.
 - 5. Alkyd Primer for Galvanized Metal.
 - 6. Water Based Primer for Galvanized Metal.
 - 7. Rust-Inhibitive Water Based Primer.
 - 8. Interior/Exterior Quick Dry Primer for Aluminum.
 - 9. Stain Blocking Primer.

2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Exterior Plaster and Stucco: 12 percent.
 - 2. Masonry, Concrete, and Concrete Masonry Units: 12 percent.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or repair existing paints or finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Masonry:
 - 1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
 - 2. Prepare surface as recommended by top coat manufacturer.
 - 3. Clean surfaces with pressurized water. Use pressure range of 600 to 1,500 psi at 6 to 12 inches. Allow to dry.
- H. Exterior Plaster: Fill hairline cracks, small holes, and imperfections with exterior patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
- I. Galvanized Surfaces:
 - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
 - 2. Prepare surface according to SSPC-SP 2.
- J. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.

2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions.
- C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- E. Apply each coat to uniform appearance.
- F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.
- G. Sand metal surfaces lightly between coats to achieve required finish.
- H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.

3.05 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 09 91 23
INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
 - 1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
 - 2. Mechanical and Electrical:
 - a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - b. In finished areas, paint shop-primed items.
 - c. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
 - d. Paint dampers exposed behind louvers, grilles, to match face panels.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.
 - 7. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 91 13 - Exterior Painting.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency.
- B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials.
- C. SCAQMD 1113 - Architectural Coatings.

- D. SSPC-SP 1 - Solvent Cleaning.
- E. SSPC-SP 2 - Hand Tool Cleaning.
- F. SSPC-SP 6 - Commercial Blast Cleaning.
- G. SSPC-SP 13 - Surface Preparation of Concrete.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
 - 4. Manufacturer's installation instructions.
 - 5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- E. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.
- F. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
 - 3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply materials when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.
- D. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
 - 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
 - 2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.
- B. Paints:
 - 1. Behr Process Corporation: www.behr.com/#sle.
 - a. Local representative Jan Piccola (714) 679-5730.
 - 2. Dunn-Edwards Corporation: www.dunnedwards.com,
 - a. Local representative Wanda Barragan (909) 261-1289.
 - 3. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 - a. Local representative John Dumesnil (619) 665-9341.
 - 4. Vista Paint; www.vistapaint.com .
 - a. Local representative Mark Brower (323) 397-9000.
- C. Primer Sealers: Same manufacturer as top coats.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.

2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
 4. Supply each paint material in quantity required to complete entire project's work from a single production run.
 5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16.
- C. Volatile Organic Compound (VOC) Content:
1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. SCAQMD 1113 Rule.
 - c. Architectural coatings VOC limits of California.
 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- D. Flammability: Comply with applicable code for surface burning characteristics.
- E. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- F. Colors: As indicated on drawings.
1. Extend colors to surface edges; colors may change at any edge as directed by Architect.
 2. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.03 PAINT SYSTEMS - INTERIOR

- A. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry units, brick, wood, plaster, uncoated steel, shop primed steel, galvanized steel, and aluminum.
1. Two top coats and one coat primer.
 2. Top Coat(s): Interior Latex.
 3. Top Coat Sheen:
 - a. Eggshell: MPI gloss level 3; use this sheen at all locations.
 - b. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
 4. Primer: As recommended by top coat manufacturer for specific substrate.
- B. Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals:
1. Medium duty applications include doors and door frames.

2. Two top coats and one coat primer.
- C. Medium Duty Vertical and Overhead: Including gypsum board, concrete, uncoated steel, shop primed steel, galvanized steel, and aluminum.
 1. Two top coats and one coat primer.
 2. Top Coat(s): Interior Light Industrial Coating, Water Based.
- D. Dry Fall: Metals; exposed structure and overhead-mounted services in utilitarian spaces, including shop primed steel deck, structural steel, metal fabrications, galvanized ducts, galvanized conduit, and galvanized piping.
 1. Shop primer by others.
 2. One top coat.
 3. Top Coat: Latex Dry Fall.
- E. Ferrous Metals, Unprimed, Latex, 3 Coat:
 1. One coat of latex primer.
 2. Semi-gloss: Two coats of latex enamel.
- F. Aluminum, Unprimed, Latex, 3 Coat:
 1. One coat etching primer.

2.04 PRIMERS

- A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
 1. Interior Institutional Low Odor/VOC Primer Sealer.
 2. Interior/Exterior Latex Block Filler.
 3. Interior Latex Primer Sealer.
 4. Interior Drywall Primer Sealer.
 5. Anti-Corrosive Alkyd Primer for Metal.
 6. Interior Rust-Inhibitive Water Based Primer.
 7. Interior Water Based Primer for Galvanized Metal.
 8. Interior/Exterior Quick Dry Primer for Aluminum.
 9. Interior Alkyd Enamel Undercoat.
 10. Stain Blocking Primer.
 11. Stain Blocking Primer, Water Based.

2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Gypsum Wallboard: 12 percent.
 - 2. Plaster and Stucco: 12 percent.
 - 3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
 - 4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Concrete:
 - 1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
 - 2. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.
- F. Masonry:
 - 1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
 - 2. Prepare surface as recommended by top coat manufacturer.
- G. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- H. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
- I. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- J. Galvanized Surfaces:

1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
 2. Prepare surface according to SSPC-SP 2.
- K. Ferrous Metal:
1. Solvent clean according to SSPC-SP 1.
 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
 3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.
- L. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- M. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with tinted primer.
- N. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions.
- C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- E. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- F. Sand wood and metal surfaces lightly between coats to achieve required finish.
- G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- H. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.

3.05 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 09 96 00
HIGH-PERFORMANCE COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. High performance coatings.
 - 1. Exterior Steel: AESS, exterior steel, metal canopies, exposed steel decks, hollow metal doors and frames, and metal copings/flashings
- B. Surface preparation.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 91 13 - Exterior Painting.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency.
- B. ASTM D2486 - Standard Test Methods for Scrub Resistance of Wall Paints.
- C. ASTM D4587 - Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings.
- D. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board.
- E. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual.
- F. NACE No. 3 - Joint Surface Preparation Standard Commercial Blast Cleaning.
- G. SCAQMD 1113 - Architectural Coatings.
- H. SSPC-SP 1 - Solvent Cleaning.
- I. SSPC-SP 2 - Hand Tool Cleaning.
- J. SSPC-SP 6 - Commercial Blast Cleaning.
- K. SSPC-SP 13 - Surface Preparation of Concrete.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Conduct a preinstallation meeting at least one week prior to the start of the work of this section; require attendance by all affected installers.
 - 1. Require attendance of parties directly affecting work of this section, including Contractor, Architect, applicator, and manufacturer's representative. Review the following:
 - a. Environmental requirements.
 - b. Protection of surfaces not scheduled to be coated.
 - c. Surface preparation.
 - d. Application.

- e. Repair.
- f. Field quality control.
- g. Cleaning.
- h. Protection of coating systems.
- i. One-year inspection.
- j. Coordination with other work.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide complete list of all products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified coating system(s) product is to be used in; include description of each system.
- C. Samples: Submit two samples 8 by 8 inch in size illustrating colors available for selection.
- D. Manufacturer's Certificate: Certify that high-performance coatings comply with VOC limits specified.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Maintenance Data: Include cleaning procedures and repair and patching techniques.
 - 1. Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and coated surfaces, and color samples of each color and finish used.
- G. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Coating Materials: 1 gallon of each type and color.
 - 3. Label each container with manufacturer's name, product number, color number, and room names and numbers where used.

1.06 QUALITY ASSURANCE

- A. Maintain one copy of each referenced document that applies to application on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- C. Applicator Qualifications: Company specializing in performing the work of this section approved by manufacturer.

1.07 MOCK-UP

- A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.
- B. Provide mock-up , 8 feet long by 8 feet wide, illustrating coating, for each specified coating.

- C. Locate where directed.
- D. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Coating Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

- A. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the coating product manufacturer.
- C. Do not install materials when temperature is below 55 degrees F or above 90 degrees F.
- D. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.
- E. Restrict traffic from area where coating is being applied or is curing.

1.10 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for bond to substrate.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide high performance coating products from the same manufacturer to the greatest extent possible.
 - 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
 - 2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.
- B. High-Performance Coatings:
 - 1. Behr Paint Corp.: www.behr.com.
 - a. Local representative Jan Piccola 714.679.5730.
 - 2. Carboline: www.carboline.com.
 - 3. PPG Paints: www.ppgpaints.com/#sle.

4. Precision Coatings: www.precisioncoatingsinc.com/#sle.
5. Sherwin-Williams Company: www.protective.sherwin-williams.com/industries/#sle.
 - a. Local Representative: John Dumesnil, 619.665.9341.
6. Tnemec Company, Inc: www.tnemec.com/#sle.
 - a. Local Representative: Tony Hobbs, 310.637.2363.
7. Substitutions: Section 01 60 00 - Product Requirements.

2.02 HIGH-PERFORMANCE COATINGS

- A. Provide coating systems that meet the following minimum performance criteria, unless more stringent criteria are specified:
 1. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0, maximum, when tested in accordance with ASTM E84.
 2. Scrubbability: Excellent, when tested in accordance with ASTM D2486.
 3. Gloss and Color Retention: Excellent, when tested in accordance with ASTM D4587.

2.03 TOP COAT MATERIALS

- A. Coatings - General: Provide complete multi-coat systems formulated and recommended by manufacturer for the applications indicated, in the thicknesses indicated; number of coats specified does not include primer or filler coat.
 1. Lead Content: Not greater than 0.06 percent by weight of total nonvolatile content.
 2. Chromium Content, as Hexavalent Chromium, Zinc Chromate, or Strontium Chromate: None.
 3. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16.
 4. Volatile Organic Compound (VOC) Content:
 - a. Provide coatings that comply with the most stringent requirements specified in the following:
 - 1) 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - 2) SCAQMD 1113 Rule.
 - 3) CARB (SCM).
 - 4) Architectural coatings VOC limits of California.
 - b. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
 5. Colors: As indicated.
- B. Latex Coating:
 1. Application: for all exterior AESS, exterior steel, metal canopies, exposed steel decks, hollow metal doors and frames, metal stair stringers and treads, guardrails/handrails, metal copings/flashings, and equipment screens,
 2. Number of Coats: Two.
 3. Product Characteristics:

- a. Dry film thickness, per coat, 2.0 to 3.0, minimum.
 - b. Comply with the performance requirements specified above for moderate exposure.
4. Top Coat(s): Acrylic, High Dispersion.
- a. Sheen: Semi-Gloss.

Surface Preparation:			SSPC-SP 6/NACE No. 3
Shop Primer:	Aromatic Urethane, Zinc-Rich	Series 94-H2O Hydro-Zinc	DFT 2.5 to 3.5 mils
Intermediate Coat:	Zinc-Rich Urethane / Acrylic / Acrylic	Series 1029 Enduratone	DFT 2.0 to 3.0 mils
Finish Coat:	Zinc-Rich Urethane / Acrylic / Acrylic	Series 1029 Enduratone	DFT 2.0 to 3.0 mils
Total DFT: 6.5 to 9.5 mils			

- b. Products:
 - 1) Basis of Design Product: Series 1029 Enduratone as manufactured by Tnemec, or approved equal.
 - 2) Substitutions: Section 01 60 00 - Product Requirements.
5. Top Coat(s): Acrylic. (plaster/concrete)
- a. Sheen: Matte.

Surface Preparation:			SSPC-SP 13/NACE No. 3
Shop Primer:	Waterborne Modified Polyamine Epoxy	Series 151-1051 Elasto-Grip FC	DFT 0.7 to 1.5 mils
Intermediate Coat:	Acrylic Emulsion	Series 1026 Enduratone	DFT 2.0 to 3.0 mils
Finish Coat:	Acrylic Emulsion	Series 1026 Enduratone	DFT 2.0 to 3.0 mils
Total DFT: 6.5 to 9.5 mils			

- b. Products:
 - 1) Basis of Design Product: Series 1029 Enduratone as manufactured by Tnemec, or approved equal.
6. Primer: As recommended by coating manufacturer for specific substrate.
- C. Epoxy Coating:
- 1. Number of coats: Two.
 - 2. Product Characteristics:

- a. Comply with the performance requirements specified above for moderate exposure.
- 3. Coating Systems for Exterior Steel:
 - a. Exterior Exposed: Moderate to severe weathering and exposure
 - b. Application: for all exterior AESS, exterior steel, metal canopies, exposed steel decks, hollow metal doors and frames, and metal copings/flashings
 - c. Basis of Design Product: Zinc / Epoxy / Hybrid as manufactured by Tnemec Company, Inc., or approved equal.

Surface Preparation:			SSPC-SP 6
Shop Primer:	Aromatic Urethane, Zinc-Rich	Series 90-97 Tneme-Zinc	DFT 2.5 to 3.5 mils
Intermediate Coat:	Polyamidoamine Epoxy	Series L69 Hi-Build EpoXoline II	DFT 2.5 to 3.5 mils
Finish Coat:	Modified Polycarbamide	Series 750 UVX	DFT 2.5 to 4.0 mils
Total DFT: 7.0 to 10.5 mils			

- d. Finish Color: As selected by Architect from manufacturer’s custom colors and As indicated on the drawings.
- 4. Top Coat(s): Polyamide Epoxy.
 - a. Sheen: Gloss.
 - b. Products:
 - 1) Sherwin-Williams; Macropoxy 646 Fast Cure Epoxy: www.protective.sherwin-williams.com/#sle. (MPI #177)
 - 2) Tnemec Company, Inc; Series 287 Enviro-Pox: www.tnemec.com/#sle.
 - 3) Substitutions: Section 01 60 00 - Product Requirements.
- D. Shellac: Pure, white type.

2.04 ACCESSORY MATERIALS

- A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of coated surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Do not begin application of coatings until substrates have been properly prepared.
- C. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.

- D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- F. Test shop-applied primer for compatibility with subsequent cover materials.
- G. Proceed with coating application only after unacceptable conditions have been corrected.
 - 1. Commencing coating application constitutes Contractor's acceptance of substrates and conditions.

3.02 PREPARATION

- A. Clean surfaces of loose foreign matter.
- B. Remove substances that would bleed through finished coatings. If unremovable, seal surface with shellac.
- C. Remove finish hardware, fixture covers, and accessories and store.
- D. Galvanized Surfaces:
 - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
 - 2. Prepare surface according to SSPC-SP 2.
- E. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.
 - 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
 - 3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning", and protect from corrosion until coated.
- F. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.

3.03 PRIMING

- A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

3.04 COATING APPLICATION

- A. Apply coatings in accordance with manufacturer's written instructions, to thicknesses specified and recommendations in "MPI Architectural Painting and Specification Manual".
- B. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.
- B. District will provide field inspection.

- C. Dry Film Thickness Testing: District will engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.

3.06 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. Clean surfaces immediately of overspray, splatter, and excess material.
- C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.
- D. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

3.07 PROTECTION

- A. Protect finished work from damage.

END OF SECTION

SECTION 10 11 00
VISUAL DISPLAY UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Porcelain enamel steel markerboards.
- B. Tackable wall panels. TWP-1.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Blocking and supports.

1.03 REFERENCE STANDARDS

- A. ANSI A135.4 - American National Standard for Basic Hardboard.
- B. ANSI A208.1 - American National Standard for Particleboard.
- C. ASTM A424/A424M - Standard Specification for Steel, Sheet, for Porcelain Enameling.
- D. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- F. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics.
- G. GANA (GIB 01-0300) - Glass Informational Bulletin (Proper Procedures for Cleaning Architectural Glass Products).

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data on porcelain enamel steel markerboard, tackboard, tackboard surface covering, trim, and accessories.
- C. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.
- D. Samples: Submit color charts for selection of color and texture of markerboard, tackboard, tackboard surface covering, and trim.
- E. Test Reports: Show compliance to specified surface burning characteristics requirements.
- F. Manufacturer's printed installation instructions.
- G. Manufacturer's Qualification Statement.
- H. Maintenance Data: Include data on regular cleaning, stain removal.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

PART 2 PRODUCTS

2.01 VISUAL DISPLAY UNITS

- A. Markerboards: Porcelain enamel on steel, laminated to core.
 - 1. Color: White.
 - 2. Steel Face Sheet Thickness: 24 gauge, 0.0239 inch .
 - 3. Core: Particleboard, manufacturer's standard thickness, laminated to face sheet.
 - 4. Backing: Aluminum foil, laminated to core.
 - 5. Size: As indicated on drawings.
 - 6. Frame: Extruded aluminum, with concealed fasteners.
 - 7. Frame Profile: As indicated on drawings.
 - 8. Frame Finish: Anodized, natural.
 - 9. Accessories: Provide marker tray and map rail.
 - 10. Manufacturers:
 - a. A-1 Visual Systems Co.: www.a-1visualsystems.com.
 - b. ADP Lemco, Inc: www.adplemco.com/#sle.
 - c. Chatfield-Clarke: www.chafield-clarke.com.
 - d. Claridge Products and Equipment, Inc: www.claridgeproducts.com/#sle.
 - e. Egan Visual Corporation; Egan Visual WhiteBoards: www.egan.com/#sle.
 - f. Nelson Adams NACO: www.nelsonadamsnaco.com/#sle.
 - g. Platinum Visual Systems: pvusa.com
 - h. Polyvision Corporation: www.polyvision.com/#sle.
 - i. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Tackable Wall Panels: Fabric laminated to fiberboard; Factory-fabricated.
 - 1. Fabric: TWP-1, as indicated on Drawings.
 - 2. Color, Pattern, and Texture: As indicated on drawings.
 - 3. Backing: Fiber board, 1/2 inch thick, laminated to tack surface.
 - 4. Surface Burning Characteristics: Flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.
 - 5. Size: As indicated on drawings.
 - 6. Edge Treatment: Square edge unless detailed otherwise.
 - 7. Edge Molding: Provide metal "J-mold" type edge trim for exposed edges at door and window openings and similar conditions.
 - 8. Adhesives: Provide manufacturer's recommended adhesive, primer, and sealer, produced for use on substrate shown on drawings. Provide materials which are mildew-resistant and non staining to wallcovering.
 - 9. Manufacturers:
 - a. A-1 Visual Systems Co.: www.a-1visualsystems.com.

- b. ABC School Equipment: www.abcse.com.
 - c. ADP Lemco, Inc: www.adplemco.com/#sle.
 - d. Chatfield-Clarke; Vinyl Tackboard Panels: www.chafield-clarke.com.
 - e. Claridge Products and Equipment, Inc; 3400 Series:
www.claridgeproducts.com/#sle.
 - f. Lamvin Inc.; Tackboard Panels: www.lamvin.com.
 - g. MooreCo, Inc: www.moorecoinc.com/#sle.
 - h. Nelson Adams NACO: www.nelsonadamsnaco.com/#sle.
 - i. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Combination Units and Units Made of More Than One Panel: Factory-assembled markerboards in a single frame, of materials specified above.
- 1. Join panels of similar construction with butt joints, aligned and secured with steel spline concealed in edge of core.
 - 2. Configuration: As indicated on drawings.
 - 3. Units Too Large to Ship Assembled: Fully assembled in factory, then disassembled for shipping.

2.02 MATERIALS

- A. Porcelain Enameled Steel Sheet: ASTM A424/A424M, Type I, Commercial Steel, with fired-on vitreous finish.
- B. Vinyl Coated Fabric: ASTM F793/F793M Category VI.
- C. Hardboard for Cores: ANSI A135.4, Class 1 - Tempered, S2S (smooth two sides).
- D. Particleboard: ANSI A208.1; wood chips, set with waterproof resin binder, sanded faces.
- E. Fiber Board: ASTM C208, cellulosic fiber board.
- F. Foil Backing: Aluminum foil sheet, 0.005 inch thick.
- G. Steel Sheet Backing: Manufacturer's standard thickness, galvanized.
- H. Adhesives: Type used by manufacturer.

2.03 ACCESSORIES

- A. Map Rail: Extruded aluminum, manufacturer's standard profile, with cork insert and runners for accessories; 1 inch wide overall, full width of frame.
- B. Map Supports: Formed aluminum sliding hooks and roller brackets to fit map rail.
- C. Temporary Protective Cover: Sheet polyethylene, 8 mil thick.
- D. Flag Holders: Cast aluminum bored to receive 1 inch diameter flag staff, bracketed to fit top rail of board.
- E. Cleaning Instruction Plate: Provide instructions for chalkboard cleaning on a metal plate fastened to perimeter frame near chalkrail.
- F. Marker Tray: Aluminum, manufacturer's standard profile, one piece full length of markerboard, molded ends, manufacturer's standard fastening method, same finish as frame.
- G. Mounting Brackets: Concealed.
- H. Factory printed grid lines for music rooms.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings.
- C. Verify flat wall surface for frameless adhesive-applied boards.

3.02 PREPARATION

- A. Acclimatize tackable wall panels by removing from packaging in installation area not less than 24 hours before application.
- B. Remove switchplates, wall plates, and surface-mounted fixtures where tackable wall paneling is applied. Reinstall items on completion of installation.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- D. Protect glass and equipment from damage caused by work of this Section.

3.03 INSTALLATION

- A. Install boards in accordance with manufacturer's instructions.
- B. Install with top of marker tray at 30 inches above finished floor.
- C. Secure units level and plumb.
- D. Butt Joints: Install with tight hairline joints.
- E. Carefully cut holes in boards for thermostats and wall switches.
- F. Install tackable wall panels in accordance with manufacturer's recommendations on specified substrates with concealed attachments.
 - 1. Fabricate re-wrapped edges where partial panels abut each other, or adjacent surfaces or trim.
 - 2. Re-wrap top, bottom or side edges for cutting panels around door or window openings, abutting trim, protruding objects, and at other openings, including x-cut at receptacles, light switches, and other openings.
 - a. Wrap minimum 2 inches around back of panel.
 - b. Carefully cut fiber board, leaving vinyl wallcovering intact. Wrap wallcovering tightly around edge of board and adhere continuously around back of panel with manufacturer's recommended vinyl wallcovering adhesive.

3.04 CLEANING

- A. Clean board surfaces in accordance with manufacturer's instructions.
- B. Cover with protective cover, taped to frame.
- C. Remove temporary protective cover at Date of Substantial Completion.
- D. Clean glazing materials in accordance with GANA (GIB 01-0300).

END OF SECTION

SECTION 10 14 00
SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Room and door signs.
- B. Emergency evacuation maps.

1.02 RELATED REQUIREMENTS

- A. Section 10 14 53 - Traffic and Parking Signage: Fire lane, accessibility and traffic signage.
- B. Section 27 51 29.13 - Rescue Assistance Signal Systems: Signage for two-way communication system.

1.03 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- C. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - 1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
 - 2. When content of signs is indicated to be determined later, request such information from District through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
 - 3. Submit for approval by District through Architect prior to fabrication.
- D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.
- E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- F. Verification Samples: Submit samples showing colors specified.
- G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
- H. Manufacturer's Qualification Statement.

- I. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store tape adhesive at normal room temperature.

1.07 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Flat Signs:
 - 1. ASI Sign Systems, Inc.: www.asisignage.com.
 - 2. Best Sign Systems, Inc: www.bestsigns.com.
 - 3. Cosco Industries (ADA signs): www.coscoarchitecturalsigns.com/#sle.
 - 4. Cosco Industries (non-ADA signs): www.coscoarchitecturalsigns.com/#sle.
 - 5. FASTSIGNS: www.fastsigns.com/#sle.
 - 6. Inpro: www.inprocorp.com/#sle.
 - 7. Mohawk Sign Systems, Inc: www.mohawksign.com.
 - 8. Seton Identification Products: www.seton.com/aec.
 - 9. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
 - 1. Requirements for Persons with Disabilities: Provide identifying devices meeting the requirements for the physically disabled of the following codes:
 - a. California Building Code (CBC) Title 24, Part 2; Chapter 11B, Accessibility.
 - b. Code of Federal Regulations 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities.
 - c. Accessible Means of Egress Signage: CBC 1009.

- 1) Two-Way Communications Signage: CBC 1009.8
 - (a) Provide at the landing of each elevator or bank of elevators on each accessible floor, one or more stories above or below the level of exit discharge. Coordinate content with system provider. CBC 1009.11
 - 2) When included, provide Area of Refuge Signage indicating special accessibility provisions as shown: CBC 1009.9
 - (a) Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign stating: AREA OF REFUGE.
 - (b) Each door providing access to an exterior area for assisted rescue shall be identified by a sign stating: EXTERIOR AREA FOR ASSISTED RESCUE.
 - (c) Comply with Chapter 11B, Section 11B-703.5, as applicable, requirements for visual characters and include the International Symbol of Accessibility.
 - (d) Where exit sign illumination is required by Section 1013.3, the **signs shall be illuminated**.
 - (e) Locate at each door to an area of refuge and exterior area for assisted rescue in accordance with Section 1013.4, signage with visual characters, raised character and braille complying with Chapter 11B, Sections 11B-703.1, 11B-703.2, 11B-703.3 and 11B-703.5.
 - (f) Provide International Symbol of Accessibility to comply with Chapter 11B, Section 11B-703.
 - 3) Directional Signage: CBC 1009.10.
 - (a) Provide directional signage complying with Chapter 11B, Section 11B-703.5 indicating the location of all other means of egress and which are accessible means of egress:
 - (1) At exits serving a required accessible space but not providing an approved accessible means of egress.
 - (2) At elevator landings.
 - (3) Within areas of refuge.
2. Raised characters shall comply with CBC 11B-703.2.
- a. Depth: It shall be 1/32 inch minimum above their background and shall be sans serif uppercase and be duplicated in Braille.
 - b. Height: It shall be 5/8 inch minimum and 2 inches maximum based on the height of the uppercase letter "I". CBC Section 11B-703.2.5
 - c. Finish and contrast: Characters and their background shall have a non-glare finish. Character shall contrast with their background with either light characters on a dark background or dark characters on a light background. CBC Section 11B-703.5.1
 - d. Proportions: It shall be selected from fonts where the width of the uppercase letter "O" is 60 % minimum and 110 % maximum of the height of the uppercase letter "I". Stroke thickness of the uppercase letter "I" shall be 15% maximum of the height of the character. CBC Sections 11B-703.2.4 and 11B-703.2.6; If characters are both visual and raised, provide stroke width min. 10% and max. 15% of the character "I".
 - e. Character Spacing: Spacing between individual tactile characters shall comply with CBC Section 11B-703.2.7.
 - 1) 11B-703.2.8 Line spacing. Spacing between the baselines of separate lines of raised characters within a message shall be 135 percent minimum and 170 percent maximum of the raised character height.

- f. Format: Text shall be in a horizontal format. CBC 11B-703.2.9.
 - g. Braille: It shall be contracted (Grade 2) and shall comply with CBC Sections 11B-703.3 and 11B-703.4. Braille dots shall have a domed and rounded shape and shall comply with CBC Table and Figure 11B-703.3.1.
 - h. Mounting height: Tactile sign on signs shall be located 48 inches minimum to the baseline of the lowest Braille cells and 60 inches maximum to the baseline of the highest line of raised characters above the finish floor or ground surface. CBC Section and Figure 11B-703.4.1.
 - i. Mounting location: A tactile sign shall be located per CBC Section and Figure 11B-703.4.2 as follows:
 - 1) alongside a single door on the latch side.
 - 2) on the inactive leaf of a double door with one active leaf.
 - 3) to the right of the right hand door at double doors with two active leaves.
 - 4) on the nearest adjacent wall where there is no wall space at the latch side of a single door or at the right side of double doors with two active leaves.
 - 5) so that a clear floor space of 18 x 18 inch minimum, centered on the tactile characters, is beyond the arc of any door swing between the closed position and 45 degree open position.
 - j. Visual characters shall comply with CBC Section 11B-703.5 and shall be 40 inches minimum above finish floor or ground.
 - k. Pictograms shall comply with CBC Section 11B-703.6.
 - l. Symbol of accessibility shall comply with CBC Section 11B-703. 7.
 - m. Variable message signs shall comply with CBC Section 11B-703.8.
- B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
- 1. Sign Type: Flat signs with injection molded or etched panel media as specified.
 - 2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
 - 3. Character Height: 1 inch.
 - 4. Sign Height: 3 inches, unless otherwise indicated.
 - 5. Doors: Identify with room numbers to be determined later, not the numbers indicated on drawings.
 - 6. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
 - 7. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.
 - a. Identify all single user toilet facilities as gender neutral facilities by a door symbol that complies with CBC Sections 11B-216.8 and 11B-703.7.2.6.3.
 - 1) No pictogram, text, or braille is required.
 - 2) Tactile jamb signage shall comply with appropriate technical requirements of CBC Section 11B-703.
 - (a) Examples of appropriate designations are "ALL-GENDER RESTROOM", "RESTROOM", or "UNISEX RESTROOM". DSA BU-17.

- (b) Provide "RESTROOM" as the signage text, unless indicated otherwise on Drawings.
- 3) See Drawings for actual sign to be provided.
- b. Geometric Symbols: The symbol color shall contrast with door or wall.
 - 1) Comply with CBC 11B-216.8.1 at the entrances to toilet and bathing rooms.
 - 2) Comply with CBC 11B-703.7.2.6.
 - (a) Men's: An equilateral triangle, ¼ inch thick edges with edges 12 inches long and a vertex pointing upward.
 - (b) Women's: A circle, ¼ inch thick and 12 inches in diameter.
 - (c) Unisex: A circle, ¼ inch thick and 12 inches in diameter with a equilateral triangle, ¼ inch thick edges with edges 12 inches long and a vertex pointing upward, superimposed on and geometrically inscribed within the circle and within the 12 inch diameter. The vertex of the triangle shall be located ¼ inch from the edge of the circle. The triangle shall contrast with the circle symbol, either light on a dark background or dark on a light background. The circle symbol shall contrast with the door.
 - (1) No pictogram is to be provided.
 - (d) Mount within 1 inch of the centerline of the door at minimum 58 inches and 60 inches maximum from the centerline of the symbol to the finished floor surface.
- 8. Exits: Provide raised character and Braille exit signs per CBC Section 1013.4 at the following locations:

<u>Location</u>	<u>Text</u>
Grade level exit door	EXIT

- C. Emergency Evacuation Maps:
 - 1. Allow for one map per building.
 - 2. Map content to be provided by District.
 - 3. Use clear plastic panel silk-screened on reverse, in brushed aluminum frame, screw-mounted.

2.03 SIGN TYPES

- A. Flat Signs: Signage media without frame.
 - 1. Edges: Square.
 - 2. Corners: Square.
 - 3. Wall Mounting of One-Sided Signs: Tape adhesive.
 - a. Provide visually matching back plate when mounted on a glass surface.
- B. Color and Font: Unless otherwise indicated:
 - 1. Character Font: Helvetica, Arial, or other sans serif font.
 - 2. Character Case: Upper case only.
 - 3. Background Color: As scheduled.
 - 4. Character Color: Contrasting color.

2.04 TACTILE SIGNAGE MEDIA

- A. Engraved Panels: Laminated colored plastic; engraved or photopolymer etched through face to expose core as background color:
1. Interior Basis of Design Product: InTouch™ ADA-Ready™ Sign System with requirements indicated for materials, thickness, finish colors, designs, shapes, sizes and details as manufactured by ASI Sign Systems, Inc., or approved equal.
 2. Total Thickness: 1/8 inch, matte finished acrylic.
 3. Fabrication:
 - a. Tactile Graphics and Text:
 - 1) Fabrication process: Provide tactile copy and grade 2 Braille raised 1/32 inch minimum from plaque first surface by manufacturer's photopolymer bonded process. Sign face of single material, tactile characters and Braille integral to photopolymer. Adhesive-fixed characters are not acceptable.
 - 2) Provide lettering and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position, and colors. Tactile characters to be raised min. 1/32 inch from surface. Computerized translation of sign copy to be responsibility of the manufacturer.
 - b. Letter style[s], color[s], letter size[s] and layout position:
 - 1) As selected by Architect from manufacturer's standard letter style and color charts.
 - c. Text Schedule: As indicated on Drawings.
 - d. Tactile Lettering and Graphics Color Options: As selected by Architect from manufacturer's standard colors.
 - e. Mounting Panel Options:
 - 1) Size:
 - (a) Same size.
 - f. Background Appearance Options:
 - 1) Solid color[s]: As selected by Architect from manufacturer's standard colors.
 - 2) Subsurface custom graphics.
 - g. Overall panel size: As indicated on Drawings.
 - h. Shape: As indicated on Drawings.
- B. Etched Metal Panels: Zinc based panel etched through face to expose core as background color:
1. Exterior Basis of Design Product: SignEtch™ ADA-Ready™ Sign System with requirements indicated for materials, thickness, finish colors, designs, shapes, sizes and details as manufactured by ASI Sign Systems, Inc., or approved equal.
 2. Total Thickness: 1/8 inch.
 3. Paint: Primer and urethane based color coat, of type standard with manufacturer.
 - a. U.V. resistant clear urethane top coat required for exterior applications.
 4. Fabrication:
 - a. Tactile Graphics and Text:

- 1) Fabrication process: Provide tactile copy and grade 2 Braille raised 1/32 inch minimum from plaque first surface by manufacturer's photochemical etching.
 - 2) Provide lettering and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position, and colors.
- b. Letter style[s], color[s], letter size[s] and layout position:
 - 1) As selected by Architect from manufacturer's standard letter style and color charts.
 - c. Raised text and graphic finishes:
 - 1) Colors/Sheen:
 - (a) As selected by Architect from manufacturer's standard colors.
 - (b) Finish: Matte.
 - d. Text Schedule: As indicated on Drawings.
 - e. Edge Detail: Square.
 - f. Edge Finish: Brushed.
 - g. Overall panel size: As indicated on Drawings.
 - h. Recessed Graphics Color Options:
 - 1) As selected by Architect from manufacturer's standard colors.
 - i. Recessed Area Texture Options:
 - 1) Smooth paint.

2.05 NON-TACTILE SIGNAGE MEDIA

- A. Silk Screened Plastic Panels: Letters and graphics silk screened onto reverse side of plastic surface:
 1. Sign Color: Clear.
 2. Total Thickness: 1/8 inch.

2.06 ACCESSORIES

- A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
- B. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material.
- C. Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material.
- D. Through Fasteners: Exposed metal fasteners matching sign finish, with type of head indicated, installed in predrilled holes.
- E. Exposed Screws: Stainless steel.
 1. Exposed fasteners are permitted only where specifically indicated, and shall be tamper proof stainless steel, countersunk, and may be painted or finished to match adjacent surfaces.
- F. Tape Adhesive: Double sided tape, permanent adhesive.

- G. Adhesives:
 - 1. Type recommended by the manufacturer of the material specified to be laminated or adhered.
 - 2. No adhesives that fade, discolor or delaminate as a result of proximity to sunlight or heat therefrom shall be used.
 - 3. Adhesives shall not change the color or otherwise deteriorate the materials to which they are to be applied.
 - 4. The adhesives shall be of non-staining, non-yellowing quality.
- H. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Do not start work until deficiencies have been corrected. Start of work of this section constitutes acceptance of the surfaces.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Mounting Method:
 - 1. Mount signs to surfaces with a minimum of four countersunk tamperproof stainless steel fasteners.
 - 2. Provide anchorage where necessary for fastening signs securely in place.
 - a. Anchorage not otherwise specified or indicated shall include expansion shields and power-driven fasteners;
 - 1) when approved:
 - (a) for concrete and masonry;
 - (b) toggle or molly bolts to plaster surfaces;
 - (c) full threaded wood screws to wood doors;
 - (d) machine or metal screws to metal doors.
 - b. Provide backing plates for mounting to expanded metal substrates.
 - 3. Adhere signs to glass with adhesive.
- C. Install neatly, with horizontal edges level.
- D. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and CBC Chapter 11B.
 - 1. Room and Door Signs: Locate on wall at latch side of door a minimum of 48 inches to the baseline of the lowest braille cells; with baseline of highest line of raised character text at maximum 60 inches above finished floor.
 - a. Comply with CBC 11B-703.4.1
- E. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

3.03 FIELD QUALITY CONTROL

- A. Inspect signs for information content, appearance, location and Braille per as noted in Section 01 45 33 - Code-Required Special Inspections.

3.04 ADJUST AND CLEAN

- A. Repair damage to signs incurred during installation. Replace signs which cannot be repaired to new condition. Clean glass, frames, and other sign surfaces, adjust hardware for proper operation.

END OF SECTION

SECTION 10 22 39
FOLDING PANEL PARTITIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Refurbish existing top-supported folding panel partitions, horizontal opening. OP-1

1.02 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications: Overhead track structural support framing.
 - 1. Primary structural support, including pre punching of support members by steel supplier in accordance with template supplied by operable partition suppliers template.
- B. Section 06 10 00 - Rough Carpentry: Wood blocking and track support shimming.

1.03 REFERENCE STANDARDS

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. ASTM E557 - Standard Guide for Architectural Design and Installation Practices for Sound Isolation between Spaces Separated by Operable Partitions.
- E. ASTM E596 - Standard Test Method for Laboratory Measurement of Noise Reduction of Sound-Isolating Enclosures.
- F. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene at project site seven calendar days prior to scheduled beginning of construction activities of this section to review section requirements.
 - 1. Require attendance by representatives of installer.
 - 2. Notify Architect four calendar days in advance of scheduled meeting date.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on hardware and accessories and colors and finishes available.
- C. Samples for Selection: Submit two samples of full manufacturer's color range for selection of colors.
- D. Samples for Review: Submit two samples of surface finish, 12 by 12 inches size, illustrating quality, colors selected, texture, and weight.
- E. Manufacturer's Instructions: Indicate special procedures.

- F. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods. Describe cleaning materials detrimental to finish surfaces and hardware finish.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of this section approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until installation.

1.08 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within five year period after Date of Substantial Completion.
- C. Provide two year manufacturer warranty against defects in material and workmanship, excluding abuse.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in protective packaging.
- B. Deliver materials in order as required by schedule for installation.
- C. Handle materials in accordance with manufacturer's instructions.

1.10 PROJECT CONDITIONS

- A. Field Measurements: Verify operable panel partition openings and storage arrangements by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.

1.11 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. OP-1 Basis of Design Product: Advanced Equipment Corporation as manufactured by Advanced Equipment Corporation, www.Advancedequipment.com, or approved equal.

2.02 EXISTING FOLDING PANEL PARTITIONS - HORIZONTAL OPENING

- A. Folding Panel Partitions: Side opening; individual panels; side stacking; manually operated.
- B. Panel Construction:
 - 1. Frame: 16 gauge, 0.0598 inch thick formed sheet steel frame top, bottom, jambs, and intermediates; welded construction, with acoustical insulation fill.

2. Panel Substrate Facing: Steel sheet, 22 gage, 0.0299 inch thickness.
 3. Panel Properties:
 - a. Thickness With Finish: 3 inches.
 - b. Width: Equal widths.
 - c. Weight: 10 lb/sq ft maximum.
- C. Panel Finishes:
1. Facing: OP-1.
 - a. ASTM F793 Category IV Carnegie Xorel, Meteor color.
 2. Facing: Markerboard.
 - a. Porcelain glass fiber enamel, baked to sheet panel surface, color as selected from manufacturer's standard range.
 - b. Size: 48 inches high. Maximum 34 inches to bottom.
 - c. Markerboard Trim: Match panel trim finish.
 3. Exposed Metal Trim: Clear anodized.
- D. Performance:
1. Surface Burning Characteristics of Panel Finish: Flame spread/smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
 2. Installed partition system track capable of supporting imposed loads, with maximum deflection of 1/360 of span.
 - a. Limit track deflection to no more than 0.10 inch between bracket supports.
- E. Accessories:
1. Ceiling Closure: White enameled ceiling closure; aluminum jamb and head molding, fittings and attachments, and intermediate meeting posts.
 2. Pocket Enclosures: Door, frame, and trim to match adjacent walls.
 3. Acoustic Sealant: As recommended by partition manufacturer.

2.03 MATERIALS

- A. Aluminum Extrusions: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
- B. Markerboard: Porcelain enamel on steel, laminated to core; color as selected.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that required utilities are available, of the correct characteristics, in proper location, and ready for use.
- C. Verify track supports are laterally braced and will permit track to be level within 1/4 inch of required position and parallel to the floor surface.
- D. Verify floor flatness of 1/8 inch in 10 feet, non-cumulative.
- E. Verify wall plumbness of 1/8 inch in 10 feet, non-cumulative.

3.02 INSTALLATION

- A. Install partition in accordance with manufacturer's instructions and ASTM E557.
- B. Install operable wall/s and accessories after other finishing operations, including painting, have been completed.
- C. Install panels in sequence as indicated on the shop drawings.
- D. Fit and align partition assembly level and plumb.
- E. Lubricate moving components.
- F. Install acoustic sealant to achieve required acoustic performance.
- G. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.

3.03 ADJUSTING

- A. Adjust partition assembly to provide smooth operation from stacked to full open position. Do not over-compress acoustic seals.
- B. Visually inspect partition in full extended position for light leaks to identify a potential acoustical leak.
- C. Adjust partition assembly to achieve lightproof seal.

3.04 CLEANING AND PROTECTION

- A. Clean finish surfaces and partition accessories.
 - 1. Clean soiled surfaces on completing installation of operable panel partitions, to remove dust, adhesives, and other foreign materials according to manufacturer's written instructions.
- B. Condition markerboard surfaces in accordance with manufacturer's instructions.

3.05 CLOSEOUT ACTIVITIES

- A. Demonstrate operation of partition and identify potential operational problems.

END OF SECTION

SECTION 10 26 00
WALL AND DOOR PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Corner guards. WP-1

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Blocking for wall and corner guard anchors.
- B. Section 09 21 16 - Gypsum Board Assemblies: Placement of supports in stud wall construction.

1.03 REFERENCE STANDARDS

- A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
- B. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies.
- E. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.
- C. Samples: Submit samples illustrating component design, configurations, joinery, color and finish.
 - 1. Submit two sections of corner guards, 24 inches long.
- D. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in District's name and registered with manufacturer.
- F. Maintenance Materials: Furnish the following for District's use in maintenance of project:
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
- G. Maintenance Data: Manufacturer's instructions for care and cleaning of each type of product. Include information about both recommended and potentially detrimental cleaning materials and methods.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.

- B. Protect work from moisture damage.
- C. Protect work from UV light damage.
- D. Do not deliver products to project site until areas for storage and installation are fully enclosed, and interior temperature and humidity are in compliance with manufacturer's recommendations for each type of item.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion.
- C. Provide five year manufacturer and installer warranty for metal crash rails.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of materials beyond that expected of normal use, as intended by manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Corner Guards:
 - 1. Babcock-Davis: www.babcockdavis.com/#sle.
 - 2. Construction Specialties, Inc: www.c-sgroup.com/#sle.
 - 3. Inpro: www.inprocorp.com/#sle.
 - 4. Koroseal Interior Products: www.koroseal.com/#sle.
 - 5. Nystrom, Inc: www.nystrom.com/#sle.
 - 6. Trim-Tex, Inc: www.trim-tex.com/#sle.
 - 7. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PERFORMANCE CRITERIA

- A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for compliance with applicable provisions of ASTM D256 and/or ASTM F476.
- B. Chemical and Stain Resistance: Unless otherwise noted, provide protection products and assemblies with chemical and stain resistance complying with applicable provisions of ASTM D543.
- C. Fungal Resistance: Unless otherwise noted, provide protection products and assemblies which pass ASTM G21 testing.

2.03 PRODUCT TYPES

- A. Corner Guards - Surface Mounted:
 - 1. Material: Type 304 stainless steel, No. 4 finish, 16 gauge, 16 inch thick.
 - 2. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.

3. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 4. Width of Wings: 1 inches.
 5. Corner: Radiused.
 6. Color: #4 Satin finish.
 7. Length: One piece.
- B. Adhesives and Primers: As recommended by manufacturer.
 - C. Mounting Brackets and Attachment Hardware: Appropriate to component and substrate.
 - D. See Section 06 10 00 for wood blocking for wall and corner guard anchors.
 - E. See Section 09 21 16 for supports in stud wall construction.

2.04 FABRICATION

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.
- C. Form end trim closure by capping and finishing smooth.

2.05 SOURCE QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Provide wall and door protection systems of each type from a single source and manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
- B. Verify that field measurements are as indicated on drawings.
- C. Verify that substrate surfaces for adhered items are clean and smooth.
 1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer. Follow adhesive manufacturer's recommendations for remedial measures at locations and/or application conditions where adhesion test's results are unsatisfactory.
- D. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.
- B. Position corner guard 4 inches above finished floor to ceiling.

3.03 TOLERANCES

- A. Maximum Variation From Required Height: 1/4 inch.

- B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

3.04 CLEANING

- A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.
- B. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

END OF SECTION

SECTION 10 44 00
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire extinguishers.
- B. Fire extinguisher cabinets.
- C. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 09 21 16 - Gypsum Board Assemblies: Finishing at recessed fire extinguisher cabinets.

1.03 REFERENCE STANDARDS

- A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems.
- B. FM (AG) - FM Approval Guide.
- C. Fire Extinguishers Standard: California Fire Code (CFC) section 906.
- D. Title 19 California Code of Regulations.
- E. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
 - 1. Use 2016 as indicated in 2019 CBC Referenced Standards.
- F. NFPA 10 - Standard for Portable Fire Extinguishers.
- G. UL (DIR) - Online Certifications Directory.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide extinguisher operational features, extinguisher ratings and classifications, color and finish, anchorage details, and installation instructions.
- C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.
- D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
 - 1. Submit for fire extinguishers and cabinets, and indicate compliance with local and State fire regulations for extinguisher mounting heights and locations.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.05 FIELD CONDITIONS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Conform to all requirements of the local and State Fire Marshal. Conform to all applicable requirements of the California Building Code (CBC), CFC, ADA and Title 19 CCR.
 - 1. Fire Extinguisher cabinets must comply with CBC sections 11B-305 Clear floor or ground space, 11B-307 Protruding Objects, 11B-308 Reach Ranges, 11B-309/811.4 Operable Parts, 11B-403 Walking Surfaces, 11B-811.3 Height.
 - 2. Comply with Section 11B-205 Operable Parts and 309 Operable Parts; Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N) of force. CBC Section 11B-309.4 Operation.
- B. Fire Extinguisher Requirements: Conform to NFPA 10, California Fire Code and Title 19 requirements for portable fire extinguishers.
- C. Current listing by California State Fire Marshal.

2.02 MANUFACTURERS

- A. Fire Extinguishers:
 - 1. Activar Construction Products Group; JL Model Cosmic Series: www.activarcpg.com/#sle.
 - 2. Amerex; www.amerex-fire.com.
 - 3. Ansul, Inc. : www.ansul.com.
 - 4. Kidde, a unit of United Technologies Corp: www.kidde.com.
 - 5. Larsen's Manufacturing Co: www.larsensmfg.com.
 - 6. Nystrom, Inc: www.nystrom.com/sle.
 - 7. Potter-Roemer: www.potterroemer.com/#sle.
 - 8. Pyro-Chem, a Tyco Business: www.pyrochem.com/#sle.
 - 9. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Fire Extinguisher Cabinets and Accessories:
 - 1. Activar Construction Products Group, Inc. - JL Industries; Cosmopolitan Series: www.activarcpg.com/#sle.
 - 2. Kidde, a unit of United Technologies Corp: www.kidde.com.
 - 3. Larsen's Manufacturing Co: www.larsensmfg.com.
 - 4. Nystrom, Inc: www.nystrom.com.
 - 5. Potter-Roemer: www.potterroemer.com/#sle.
 - 6. Strike First Corporation of America: www.strikefirstusa.com.
 - 7. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 FIRE EXTINGUISHERS

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
 - 1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.
- B. Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage. Fully serviced and tagged.
 - 1. Stored Pressure Operated: Deep Drawn.
 - 2. Class: 2-A: 10B:C.
 - 3. Size: 10 pound.
 - 4. Size and classification as scheduled.
 - 5. Finish: Baked polyester powder coat, color as selected.

2.04 FIRE EXTINGUISHER CABINETS

- A. Fire Rating: Listed and labeled in accordance with ASTM E814 and ASTM E119 requirements for fire resistance rating of walls where being installed.
- B. Cabinet Construction: Non-fire rated.
 - 1. Formed stainless steel sheet; 0.036 inch thick base metal.
 - 2. Basis of Design Product; 6 inch stud: Cosmopolitan Stainless Steel FE Cabinet Trimless 1034PW-W-17-PUCH as manufactured by Activar, or approved equal.
 - 3. Basis of Design Product; 4 inch stud: Cosmopolitan Stainless Steel FE Cabinet Semi-Recessed 1036V17LDVRF 1-1/2" Square Trim as manufactured by Activar, or approved equal.
 - 4. Basis of Design Product; 3-1/2 inch stud: Cosmopolitan Stainless Steel FE Cabinet Semi-Recessed 1037V17LDVRF 3" Rolled Trim as manufactured by Activar, or approved equal.
- C. Fire Rated Cabinet Construction: One-hour fire rated, or as required by wall assembly.
 - 1. Steel; double wall or outer and inner boxes with 5/8 inch thick fire barrier material.
 - 2. Basis of Design Product; 8 inch stud: Cosmopolitan Stainless Steel FX Cabinet Trimless 1034D17FX2-W-PUCH as manufactured by Activar, or approved equal.
 - a. Requires minimum 7-1/4 inch from finish face of gypsum board. Can be used with 2 layers of gypsum board and 6 inch metal stud.
 - 3. Basis of Design Product; 6 inch stud: Cosmopolitan Stainless Steel FX2 Fire Rated FE Cabinet Semi-Recessed 1036V17FX2-LDVRF 1-1/2" Square Trim as manufactured by Activar, or approved equal.
 - 4. Basis of Design Product; 4 inch stud: Cosmopolitan Stainless Steel FX2 Fire Rated FE Cabinet Semi-Recessed 1037V17FX2-LDVRF 3" Rolled Trim as manufactured by Activar, or approved equal.
- D. Cabinet Configuration: Trimless Recessed type.
 - 1. Size to accommodate accessories.

2. Exterior nominal dimensions of 10-5/8 inch wide by 24 inch high by 6 inch deep. Add 1 inch for fire rated.
 3. Trimless type.
 4. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim and door stiles.
- E. Cabinet Configuration: Recessed type.
1. Size to accommodate accessories.
 2. Exterior nominal dimensions of 13-7/8 inch wide by 27-3/8 inch high by 6 inch deep.
 3. Trim: Flat square edge, with 13-7/8 inch wide face.
 4. Projected Trim: Returned to wall surface, with 3/8 inch projection, and 1.69 inch wide face.
 5. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim and door stiles.
- F. Cabinet Configuration: Semi-recessed type.
1. Size to accommodate accessories.
 2. Exterior nominal dimensions of 13-7/8 inch wide by 27-3/8 inch high by 6 inch deep.
 3. Trim: Flat rolled edge, with 13-7/8 inch wide face.
 4. Projected Trim: Returned to wall surface, with 3 inch projection, and 1.69 inch wide face.
 5. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim and door stiles.
- G. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with roller type catch. Hinge doors for 180 degree opening with continuous piano hinge.
1. Provide manufacturer's option for compliance with Americans with Disabilities Act (ADA) projection criteria and accessible handle.
 2. Latching and locking hardware operable with a single effort by lever-type hardware or other type hardware not requiring ability to grasp opening hardware and not requiring an opening force greater than 5 pounds.
- H. Door Style: Slot glazed style vertical duo-panel with glazing, continuous hinge, roller catch, zinc plated pull handle and cylinder lock.
1. Door Glazing: Tempered glass, clear, 1/8 inch thick, and set in resilient channel glazing gasket.
- I. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.
- J. Fabrication: Weld, fill, and grind components smooth.
- K. Finish of Cabinet Exterior Trim and Door: No.4 - Brushed stainless steel.
- L. Finish of Cabinet Interior: White colored enamel.

2.05 ACCESSORIES

- A. Extinguisher Brackets: Formed steel, chrome-plated.

1. Where indicated, at Custodial, Mechanical and Electric Rooms, provide surface mounted bracket with retainer straps.
 2. Basis of Design Product: Model 846 as manufactured by Larsen's Manufacturing Company, or approved equal.
 3. Provide brackets with 3-point connection within cabinets and for locations where fire extinguisher is wall-mounted without cabinet.
 - a. Bracket design shall prevent accidental dislodgement of extinguisher.
 - b. Provide size required for type and capacity of specified extinguisher.
- B. Cabinet Signage:....
1. Identify extinguisher locations with red lettered white decals spelling "FIRE EXTINGUISHER INSIDE" applied to wall or exterior door surface outside each room housing a fire extinguisher. Letter size, style and location as selected by Architect, to comply with local fire authority requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install cabinets in prepared recesses in walls. Verify recess dimensions for standard non-rated and fire rated where required.
- C. Install cabinets plumb and level in wall openings, 24 inches from finished floor to inside bottom of cabinet.
 1. Cabinet installation shall conform to requirements of the Fire Marshal, CBC, and ADA for location and height of extinguisher.
 2. Place cabinet to position the extinguisher handle at maximum 48 inches AFF.
 3. Place Cabinet 40 inches (1,016 mm) AFF to centerline of cabinet handle.
- D. Secure rigidly in place.
 1. Use oval head fasteners with exposed surfaces of same finish as cabinet.
 2. Fasten cabinets to wood studs with full threaded wood screws or with sheet metal screws.
- E. Maintain acoustical integrity of walls by filling cavity around box with unfaced fiberglass insulation or by applying electrical outlet box acoustical sheeting to the back, top, bottom and sides.
- F. Place extinguishers in cabinets and on wall brackets.
 1. Mount freestanding fire extinguishers on steel brackets on walls at locations indicated on drawings, with fire extinguisher handle located maximum 48-inches above finish floor. Mount steel brackets to solid backing.

2. Mount fire extinguishers to brackets in all cabinets.
3. Place fire extinguishers immediately prior to issuance of "Notice of Completion" or sooner if directed by Fire Marshal or District.

3.03 SCHEDULES

- A. All extinguishers and cabinets shall be quantities and locations as indicated per Drawings or as indicated by field inspection by Fire Marshall.
- B. Place the fire extinguishers based on the allowable maximum travel distance to extinguisher as indicated on Drawing and as follows:
 1. Class A = 75 feet
 2. Class B = 50 Feet
 3. Class C = 50 Feet
 4. Class K = 30 Feet
- C. Multi-Purpose Room: 1 Dry Chemical Type 4A-80BC, 10 lb. capacity, baked enamel finish extinguisher placed in specified cabinet. Ansul Sentry 10 Model No. AA10S.
- D. General Use: 1 Dry Chemical Type 2A-10BC, 10 lb. capacity, baked enamel finish extinguisher placed in specified cabinet. Ansul Sentry 10 Model No. AA10S.
- E. Classroom Use: 1 Dry Chemical Type 2A-10BC, 2.5 lb. capacity, baked enamel finish extinguisher placed in specified cabinet. Ansul Sentry 10 Model No. AA10S.
- F. Vocational Areas: 1 fire blanket, 1 Dry Chemical Type 4A:40B:C JL Industries Galaxy 6, 6 lb. capacity extinguisher, placed in JL Industries Ambassador 1013-G-10 cabinet surface mounted to CMU, 13-11/16 W by 27-3/16 H by 6-1/2 D inches, with vertical lettering.

3.04 TYPES

Fire Class	Geometric Symbol	Pictogram	Intended Use	Mnemonic
A			Ordinary solid combustibles	A for "Ash"
B			Flammable liquids and gases	B for "Barrel"
C			Energized electrical equipment	C for "Current"
D		(none)	Combustible metals	D for "Dynamite"
K			Oils and fats	K for "Kitchen"

Fire extinguishing capacity is rated in accordance with ANSI/UL 711: Rating and Fire Testing of Fire Extinguishers.

The ratings are described using numbers preceding the class letter, such as 1-A:10-B:C.

The number preceding the A multiplied by 1.25 gives the equivalent extinguishing capability in gallons of water.

The number preceding the B indicates the size of fire in square feet that an ordinary user should be able to extinguish.

There is no additional rating for class C, as it only indicates that the extinguishing agent will not conduct electricity, and an extinguisher will never have a rating of just C.

END OF SECTION

SECTION 11 52 13
PROJECTION SCREENS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Front projection screen assemblies.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood blocking in walls and ceilings.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's catalog cuts and descriptive information on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Wiring diagrams for motor operators and actuators, and controls and switches.
- C. Shop Drawings: For custom installations, indicate dimensions, verified field measurements, mounting details, and interface with adjacent construction.
- D. Samples: For screen fabrics, submit two samples 6 by 6 inch in size.
- E. Manufacturer's Qualification Statement.
- F. Installer's Qualification Statement.
- G. Operation and Maintenance Data: Provide manufacturer's operation and maintenance instructions.
- H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in District's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver projection screens to project site in manufacturer's original unopened packaging, and inspect for damage and proper size before accepting delivery.
- B. Store in a protected, clean, dry area with temperature maintained above 50 degrees F, and stack in accordance with manufacturer's recommendations.
- C. Acclimate screens to building temperatures for 24 hours prior to installation, in accordance with manufacturer's recommendations.

1.06 FIELD CONDITIONS

- A. Maintain interior of building between 60 degrees F and 75 degrees F during and after installation of projection screens.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide one year manufacturer warranty for projection screen assembly.

PART 2 PRODUCTS

2.01 FRONT PROJECTION SCREENS

- A. Manufacturers:
 - 1. Da-Lite Screen Company: www.da-lite.com/#sle.
 - 2. Draper, Inc (Manual); Luma 2: www.draperinc.com/#sle.
 - a. Local Contact: Kathy Greenway, 714.396.9732; kgreenway@draper.com
 - 3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Front Projection Screens: Factory assembled unless otherwise indicated.
 - 1. Dimensions: As indicated on drawings.
 - 2. Located in Classrooms: Manual, matte light diffusing fabric screen, wall mounted.
 - a. Screen Viewing Area: 58 inch high by 119 inch wide.
- C. Matte Light Diffusing Fabric: Light diffusing screen fabric; washable, flame retardant and mildew resistant.
 - 1. Material: High contrast gray vinyl on fiberglass backing, with nominal gain of 0.8 over viewing angle not less than 70 degrees from axis, horizontally and vertically.
 - 2. Seams: No seams permitted in fabric up to 96 inch high by 72 inch wide.
- D. Extra Drops: White; 11 inch wide.
- E. Exposed Screen Cases: Steel, with integral roller brackets.
 - 1. Finish: Baked enamel.
 - 2. Color: White.
 - 3. End Caps: Steel; finished to match case.
 - 4. Provide supports for suspension from ceiling where indicated.
 - 5. Mounting: Wall.
- F. Manually-Operated Screens:
 - 1. Roller: 1-3/4 inch aluminum; spring loaded with locking device.
 - 2. Screen Pull: Ring on bottom bar.
 - 3. Vertical Tensioning: Screen fabric weighted at bottom with steel bar and plastic end caps.
 - 4. Horizontal Tensioning: Not required.

- G. Provide mounting hardware, brackets, supports, fasteners, and other mounting accessories required for a complete installation, in accordance with manufacturer's recommendations for specified substrates and mountings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate is finished and ready to accept screen installation.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Do not install projection screens until climate control systems are in place and interior painting and other finishes are completed.

3.02 PREPARATION

- A. Coordinate screen installation with installation of projection systems.
- B. Coordinate installation with adjacent construction and fixtures, including ceilings, walls, lighting, fire suppression, and registers and grilles.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions, using manufacturer's recommended hardware for relevant substrates.
- B. Do not field cut screens.
- C. Install screens in mountings as specified and as indicated on drawings.
- D. Install plumb and level.
- E. Adjust projection screens and related hardware in accordance with manufacturer's instructions for proper placement and operation.

3.04 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch up, repair, or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 11 53 00
LABORATORY EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Contractor-furnished laboratory equipment including CFOI equipment installed by Owner.
- B. Installation of Contractor-furnished (CFCl) equipment.
- C. Installation of District-furnished (OFCl) equipment.
- D. Coordination with District-furnished District-installed (OFOI) equipment.

1.02 RELATED REQUIREMENTS

- A. Section 01 23 00 - Alternates: Descriptions of items, administrative requirements.
- B. Section 11 53 20 - Modular Wall Panel Enclosures: Enclosures of services spaces for laboratory equipment.

1.03 ABBREVIATIONS AND ACRONYMS

- A. OFOI - Owner Furnishes and Owner Installs.
- B. CFOI - Contractor Furnishes and Owner Installs.
- C. OFCl - Owner Furnishes and Contractor Installs.
- D. CFCl - Contractor Furnishes and Contractor Installs.

1.04 REFERENCE STANDARDS

- A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix).
- B. ASME BPVC - Boiler and Pressure Vessel Code.
- C. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- F. ASTM A879/A879M - Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
- H. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- I. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
- J. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass.

- K. NAAMM AMP 500-06 - Metal Finishes Manual.
- L. NFPA 70 - National Electrical Code.
- M. SMACNA (SRM) - Seismic Restraint Manual Guidelines for Mechanical Systems.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate installation of laboratory equipment with laboratory casework and Owner-furnished, Owner-installed laboratory equipment.
- B. Preinstallation Meeting: Convene one week before starting work of this section.
- C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide equipment dimensions and construction; equipment capacities; physical dimensions; utility and service requirements, clearances, and locations; required accessories and optional features; point loads.
- C. Shop Drawings: Indicate equipment locations, large scale plans, elevations, cross sections, rough-in and anchor placement dimensions and tolerances, installation and servicing clearances required.
- D. Samples: Submit two samples of exposed finish surfaces, ____by____ inch in size illustrating color and finish.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Test Reports: Factory tests for each type of equipment.
- G. Manufacturer's Installation Instructions: Indicate special installation requirements.
- H. Manufacturer's Qualification Statement.
- I. Installer's Qualification Statement.
- J. Operation Data: Include description of equipment operation and required adjusting and testing .
- K. Maintenance Data: Identify system maintenance requirements, servicing cycles, lubrication types required and local spare part sources.
- L. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in District's name and registered with manufacturer.
- M. Project Record Documents: Record actual locations of concealed utility connections.

1.07 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the types of products specified in this section, with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience and approved by manufacturer.
- C. Preconstruction Testing: Factory-test each type of equipment.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Package each piece of equipment to ensure protection from damage during shipment and delivery. Legibly indicate on the exterior of each container or crate, the shipping address and a brief description of its contents. Outside of the container, fasten a waterproof envelope containing a packing list and complete instructions for uncrating and setting the equipment in place.
- B. Protect finished surfaces during handling and installation with protective covering of polyethylene film or another suitable material.

1.09 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
- C. Provide ten year manufacturer warranty for materials, parts, and labor for sterilizer chamber.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Comply with applicable codes for each individual equipment item.
- B. Comply with UL requirements for fabrication and installation of each individual equipment item.
- C. Provide certificate of compliance from authorities having jurisdiction (AHJ) indicating approval of each individual equipment item.

2.02 EQUIPMENT

- A. Equipment: Scheduled at end of this section or under separate cover.
- B. District furnishes and installs equipment noted as OFOI.
- C. District furnishes and Contractor installs equipment noted as OFCI.
- D. Contractor furnishes and installs equipment noted as CFCI.
- E. Contractor furnishes and District installs equipment noted as CFOI.
- F. Each item energized by a single switch.
- G. Prewire and prepipe each unit of equipment complete with trim and fittings. Include reduced pressure or atmospheric type backflow preventer fitting to prevent backflow of polluted water or waste into water supply system or equipment. Comply with applicable code requirements.
- H. Affix a securely attached plate which includes the manufacturer's name, address, and catalog or serial number to each equipment item. If applicable, include pressure vessels bearing the ASME stamp and pressure rating, indicating compliance with applicable code requirements.
- I. Installation Accessories: Provide all rough-in frames, anchors, supports, accessories and closure trim required for complete installation.
- J. Use corrosion-resistant materials for all rivets, bolts, nuts, studs, spacers, and welding metal.

- K. Fully assemble equipment in factory, except for those items which cannot be moved to their final locations as single item due to new construction space restrictions.

2.03 MATERIALS

- A. Aluminum Sheet: ASTM B209 or ASTM B209M, 5005-H32 minimum; alloy and temper recommended by aluminum producer and finisher for use and finish indicated.
 - 1. Finish: AAMA 2603
- B. Galvanized Steel Sheet: ASTM A653/A653M, G90 (Z275) coating.
- C. Steel Sheet: ASTM A1008/A1008M; uncoated, cold rolled, Type CS (commercial steel), exposed or ASTM A879/A879M electrolytic zinc coating over ASTM A1008/A1008M, steel sheet substrate.
- D. Stainless-Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304 and 316, stretcher-leveled standard of flatness.
- E. Laminated Safety Glass: ASTM C1172
- F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- G. Fasteners: Stainless-steel, or other corrosion-resistant materials, standard with the manufacturer.
- H. Welding Materials: Comply with ASME BPVC SEC II-C.
- I. Metal Finishes: Comply with NAAMM AMP 500-06.

2.04 SOURCE QUALITY CONTROL AND TESTS

- A. Provide shop inspection and testing for each individual equipment items.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that utility connections, rough-in frames, anchors and supports are accurately placed and deliver building services at specified characteristics and/or within acceptable functional ranges.
- B. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Provide rough-in frame and anchors for placement as indicated on Drawings.

3.03 INSTALLATION

- A. Installation of equipment noted as OFOI or CFOI is by District. Coordinate those installations with work by Contractor.
- B. Installation of equipment noted as OFCI or CFCI is by Contractor. Coordinate with equipment furnished and/or installed by District.

- C. Install in accordance with manufacturer's instructions.
- D. Install in accordance with standards required by authority having jurisdiction.
- E. Large Components: Ensure that large components can be moved into final position without damage to other construction.
- F. Mounting: Anchor equipment securely in place.
 - 1. Mount equipment in compliance with SMACNA (SRM) requirements.
- G. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner, and their locations are coordinated with equipment rough-in requirements.
 - 1. Require manufacturer's installer to supervise connection to utilities being performed by mechanical and electrical trades.
 - 2. Make connections between ferrous and nonferrous metallic pipe with dielectric waterways and flanges having temperature and pressure rating equal to or greater than that specified for the connecting piping. Use dielectric waterways internally lined with an insulator specifically designed to prevent current flow between dissimilar metals.
- H. Touch-up minor damaged surfaces caused during installation. Replace damaged components as directed by Architect.

3.04 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate installation of _____ with _____.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Provide manufacturer's field representative to inspect _____.
- C. Perform functional testing in accordance with referenced specification requirements. Test one item or similar model, as necessary or appropriate, to ensure that it is operational and installation complies with specification requirements.
- D. Hydrostatic Testing: Test piping system at pressure of 1.5 times system operating pressure with water at temperature not exceeding 100 degrees F.
 - 1. Before test, remove or isolate gauge traps and apparatus that may be damaged by that pressure.
 - 2. Install calibrated test gauge in system to observe any loss of pressure.
 - 3. Close off system and maintain test pressure not less the one hour. Inspect joints and equipment connections for leaks.
 - 4. Retest and make repair until no further leaks are observed.
 - 5. Manufacturer's standard equipment warranty shall not begin until the manufacturer certifies that equipment complies with required testing specified and until beneficial occupancy of portion of facility where equipment is installed.
 - 6. Submit certified copies of results of factory tests of equipment tested.
 - 7. Submit field test reports in booklet form showing field tests performed to adjust each component and field tests have been performed to confirm compliance with specified performance criteria, upon completion and testing of installed equipment.

- a. Indicate in each test report the final position of controls.

3.06 ADJUSTING

- A. Adjust operating equipment to efficient operation.

3.07 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- B. See Section 01 79 00 - Demonstration and Training, for additional requirements.
- C. Demonstrate proper operation of equipment to District's designated representative.
- D. Demonstration: Demonstrate operation of system to District's personnel.
 - 1. Use operation and maintenance data as reference during demonstration.
 - 2. Conduct walking tour of project.
 - 3. Briefly describe function, operation, and maintenance of each component.
- E. Training: Train District's personnel on operation and maintenance of system.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of two hours of training.
 - 3. Instructor: Manufacturer's training personnel.
 - 4. Location: At project site.
 - 5. Location: District's offsite classroom facilities may be used.
 - 6. Location: Provide local classroom facilities.
 - 7. Location: At manufacturer's training facility; include travel expenses for one member of District's staff.
- F. Final Acceptance: Remove labels, fingerprints, and clean all surfaces both inside and out. Repair any marred or damaged surfaces that affect appearance, such as both interior and exterior of cabinets in a manner acceptable to District. Replace any parts that cannot be repaired in such a manner.

3.08 MAINTENANCE

- A. See Section 01 70 00 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
- B. Provide a separate maintenance contract for specified maintenance service.
- C. Provide a separate maintenance contract for the service and maintenance of _____ for _____ years from Date of Substantial Completion.

3.09 SCHEDULE

- A. See drawings for Laboratory Equipment Schedule.

END OF SECTION

SECTION 12 35 53.19
WOOD LABORATORY CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wood cabinets and cabinet hardware.
- B. Countertops. SSM-1, SSM-2
- C. Laboratory sinks.
- D. Service fittings and outlets.
 - 1. Service tunnels, service turrets, supporting structures and reagent racks of the type shown on the details.
- E. Refurbish Existing Kewaunee Signature Series:
 - 1. All pulls, hinges, and glides to function as new.
 - 2. All doors and door in like new working order with matching hardware.
 - 3. When removing/replacing sections sand, patch, seal to matching color and sheen.
 - 4. Hardware is available from the existing casework manufacturer.

1.02 RELATED REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Requirements for sustainably harvested wood.
- B. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: VOC limitations for adhesives and sealants.
- C. Section 01 73 56 - Alteration and Modernization Execution Procedures.
- D. Section 06 10 00 - Rough Carpentry: Blocking and nailers for anchoring casework.
- E. Section 07 92 00 - Joint Sealants: Sealing joints between casework and countertops and adjacent walls, floors, and ceilings.
- F. Section 09 21 16 - Gypsum Board Assemblies: Reinforcements in metal-framed partitions for anchoring casework.
- G. Section 09 65 00 - Resilient Flooring: Resilient wall base.
- H. Section 22 40 00 - Plumbing Fixtures for non-laboratory sinks.
- I. Division 22 - Plumbing: Supply and waste pipes installed inside the casework and adjacent walls and floors.
- J. Division 26 - Electrical: Wiring to electrical fixtures and equipment included in this section.
- K. Division 23 - Heating, Ventilation and Air-Conditioning (HVAC): Ducting to fume hoods.

1.03 DEFINITIONS

- A. Exposed: Portions of casework visible when drawers and cabinet doors are closed, including end panels, bottoms of cases more than 42 inches above finished floor, tops of cases less than 72 inches above finished floor and all members visible in open cases or behind glass doors.

- B. Semi-Exposed: Portions of casework and surfaces behind solid doors, tops of cases more than 72 inches above finished floor and bottoms of cabinets more than 30 inches but less than 42 inches above finished floor.
- C. Concealed: Sleepers, web frames, dust panels and other surfaces not generally visible after installation and cabinets less than 30 inches above finished floor.

1.04 REFERENCE STANDARDS

- A. ANSI A135.4 - American National Standard for Basic Hardboard.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- C. ASTM C1036 - Standard Specification for Flat Glass.
- D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
- E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards.
- F. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1.
- G. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood.
- H. SEFA 2 - Installations.
- I. SEFA 3 - Laboratory Work Surfaces.
- J. SEFA 7 - Laboratory Fixtures.
- K. SEFA 8W - Laboratory Grade Wood Casework.
- L. WI (CCP) - Certified Compliance Program (CCP).
- M. WI (MCP) - Monitored Compliance Program (MCP).

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate installation of casework with related items.
- B. Service Fixtures: Coordinate location and characteristics of service connections.
- C. Equipment and Instruments: Coordinate installation of casework with equipment and scientific instruments.
- D. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
- E. Keying Conference: Conduct conference prior to ordering keys. Incorporate conference decisions into keying submittal.

1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Component dimensions, configurations, construction details, joint details, attachments; manufacturer's catalog literature on hardware, accessories, and service fittings, if any.
- C. Shop Drawings: Indicate casework types, sizes, and locations, using large scale plans, elevations, and cross sections. Include rough-in and anchors and reinforcements placement dimensions and tolerances, clearances required, and utility locations, if any. Include

coordinated information for laboratory equipment specified in another section and/or furnished by Owner.

1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
2. Provide the information required by AWMAC/WI (NAAWS).
3. Include certification program label.
 - a. Affix a Woodwork Institute Certified Compliance Label WI (CCP) on the first page of the shop drawings.
- D. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- E. Samples: Submit actual samples of architectural cabinet construction, minimum 24 inches wide by full depth, illustrating proposed cabinet, countertop, shelf unit, wall unit, and student workstation; substrate and finish.
 1. Worktop: 4" x 4" sample of each material.
 2. Finish: 3" x 5" sample of each available standard stain color with finish.
 3. Hardware: Pulls, locks and hinges.
 4. One complete, with specified hardware, standing height, 24" wide base unit.
 5. One complete, with specified hardware, 30" high, 24" wide solid door wall case.
- F. Test Reports: From independent laboratory indicating compliance with referenced chemical-resistance standards for cabinet finish and liner materials.
 1. Submit test data confirming that materials used for vertical exposed surfaces and all semi exposed surfaces will meet the requirements of the one hour chemical resistance test as found in the appendix of the NAAWS.
- G. Assembly Test Report:
 1. Provide test results from independent testing laboratory indicating casework manufacturer and casework is in compliance with SEFA 8.
- H. Manufacturer's installation instructions.
- I. Manufacturer's Qualification Statement.
- J. Installer's Qualification Statement.
- K. Maintenance Data: Manufacturer's recommendations for care and cleaning.
- L. Finish touch-up kit for each type and color of materials provided.

1.07 QUALITY ASSURANCE

- A. Construction Standards: Casework materials and fabrication minimum standards shall be in accordance with Architectural Woodwork Standards.
- B. Single Source Responsibility:
 1. Provide laboratory casework with tops and fume hoods manufactured or furnished by the same laboratory furniture company.
 2. The wood science casework contractor shall also provide work tops and fume hoods to assure proper staging, shipment and single source responsibility.

- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- D. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience and approved by manufacturer.
- E. Quality Certification:
 - 1. Comply with WI (MCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.woodworkinstitute.com/#sle.
 - 2. Provide labels or certificates indicating that the installed work complies with AWMAC/WI (NAAWS) requirements for grade or grades specified.
 - 3. Provide designated labels on shop drawings as required by certification program.
 - 4. Provide designated labels on installed products as required by certification program.
 - 5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
- F. The use of catalog numbers and specific requirements set forth on the drawings and in the specifications, are not intended to preclude the use of any other acceptable manufacturer's product or procedures which may be equal, but are given for purpose of establishing standard of design and quality for materials, construction and workmanship.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Protect items provided by this section, including finished surfaces and hardware items during handling and installation. For metal surfaces, use polyethylene film or other protective material standard with the manufacturer.
- B. Acceptance at Site:
 - 1. Do not deliver or install casework until the conditions specified under Part 3, Examination Article of this section have been met. Products delivered to sites that are not enclosed and/or improperly conditioned will not be accepted if warping or damage due to unsatisfactory conditions occurs.
- C. Storage:
 - 1. Store casework in the area of installation. If necessary, prior to installation, temporarily store in another area, meeting the environmental requirements specified under Part 3, "Site Verification of Conditions" paragraph of this section.

1.09 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion, at no additional cost to District. Defects include, but are not limited to:
 - 1. Ruptured, cracked, or stained finish coating.
 - 2. Discoloration, or lack of finish integrity.
 - 3. Cracking or peeling of finish.
 - 4. Failure of hardware.

1.10 FIELD CONDITIONS

- A. During and after installation of casework, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.
- B. Delivery of architectural millwork shall be made only when the area of operation is enclosed, all plaster and concrete work is dry and the area broom clean.
- C. The work area shall be well ventilated and protected from direct sunlight, excessive heat, rain, or moisture. Temperature shall be maintained between 60 and 90 degrees F and relative humidity between 45% and 65%. The HVAC system shall be on and running.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Wall hung cabinets and floor supported cabinets over 5 feet high shall be braced and anchored in accordance with the California Building Code (CBC), Table 1607A.1.
 - 1. See Section 06 41 00 - Architectural Wood Casework for additional information.

2.02 MANUFACTURERS

- A. Existing Wood Laboratory Casework:
 - 1. Kewaunee Scientific Corp: www.kewaunee.com.
- B. Countertops:
 - 1. Kewaunee Scientific Corp; Kemresin: www.kewaunee.com.

2.03 LABORATORY CASEWORK

- A. Wood Laboratory Casework: Solid wood and wood panel construction; each unit self-contained and not dependent on adjacent units or building structure for rigidity; in sizes necessary to avoid field cutting except for scribes and filler panels. Include adjustable levelers for base and tall cabinets.
 - 1. Existing Style 1: Signature Series Wood Cabinet. Conventional Radius Lip doors and drawer fronts slightly at edges.
 - 2. Species: Maple.
 - 3. Cabinet Nominal Dimensions: Unless otherwise indicated, provide cabinets of widths and heights indicated on drawings, and with following front-to-back dimensions:
 - a. Base Cabinets: 22 inches.
 - b. Tall Cabinets: 22 inches.
 - c. Upper Cabinets: 16 inches.
 - 4. Construction: Joints doweled, glued and screwed, except drawers may be lock-shoulder jointed; with interior of units smooth and flush; cabinet bottom flush with top of face frame; without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.
 - 5. Structural Performance: In addition to the requirements of SEFA 3, SEFA 7, and SEFA 8W, components safely support the following minimum loads:
 - a. Base Units: 500 pounds per linear foot across the cabinet ends.

- b. Suspended Units: 300 pounds static load.
 - c. Tables: 300 pounds, minimum, on four legs.
 - d. Drawers: 125 pounds, minimum.
 - e. Hanging Wall Cases: 300 pounds.
 - f. Shelves: 100 pounds, minimum.
6. Seismic Performance: Casework, including attachments to other work, able to withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - a. See Section 01 41 00 - Regulatory Requirements for Design earthquake spectral response acceleration, short period (Sds) for Project.
 - b. Component Importance Factor: 1.0.
 7. Glazing: Type and thickness standard with manufacturer.
 - a. Framed Doors: Tempered glass, with gaskets and removable stops; minimize rattling and vibration.
 8. Fittings and Fixture Locations: Cut and drill counter tops, backs, and other components for service outlets and fixtures.
 9. Access Panels: Where indicated, for maintenance of utility service and mechanical and electrical components.
 10. Removable back panels on base cabinets. Provide partial height back panels at sink cabinets.
 11. Fixed panels at backs of open spaces between base cabinets and at ends of utility spaces not otherwise enclosed.
 - a. Cutouts for power receptacles where indicated on drawings.
 12. Scribes and Fillers: Panels of matching construction and finish, for locations where cabinets do not fit tight to adjacent construction.
 13. Factory-finish all exposed and semi-exposed surfaces with the same finish.
 - a. Finish Performance: Provide finish on all surfaces having chemical resistance of Level 0 (no change) or Level 1 (slight change of gloss or slight discoloration) according to SEFA 8W and no visible effect when surface is exposed to:
 - 1) Hot water at temperature between 190 degrees F and 205 degrees F trickled down the test surface at 45 degree angle for 5 minutes.
 - 2) Constant moisture in the form of 2 by 3 by 1 inch thick cellulose sponge kept continually saturated with water and in contact with test surface for 100 hours.
 - b. Preparation: Wood sanded smooth, free from dust and mill marks.
 - c. Stain: Single application of clean, manufacturer-recommended stain of selected color; tinted coating not acceptable.
 - d. Coating: Clear, superior-quality, chemical-resistant acyclic urethane; applied in accordance with manufacturer instructions, force-dried, sanded and wiped clean.
 - e. Coats: Multiple coats as required to achieve minimum 1.5 mil dry film thickness.
 - f. Appearance: Clear satin gloss; not cloudy or muddy.
- B. Apron Frames: Construction similar to other cabinets, fabricated from solid wood panels.
1. Assemblies consisting of front and back panels, with drawer suspension framing mechanically fastened to support channels spanning between them.

2. Apron Drawers: Manufacturer's standard drawer construction and size for apron installation. Single drawer for aprons up to 48 inches wide, two drawers for wider aprons.
- C. Countertop Panel-Type Supports: Materials similar to adjacent casework, 1-1/2 inch in width, with front-to-back and toe space dimensions matching base cabinet. Designed to be secured in a concealed fashion to countertop material. Include two leveling devices per support panel.

2.04 CABINET HARDWARE

- A. Manufacturer's standard types, styles, and finishes.
- B. Finish of exposed stainless steel components: No.4 finish.
- C. Locks: Provide locks on casework drawers and doors where indicated. Lock with 5 pin cylinder and 2 keys per lock.
 1. Hinged Doors: Cam type lock, bright chromium plated over nickel on base material.
 2. Tall Hinged Doors: Three-point latching system.
 3. Keying: Key locks alike within a space; key each room separately.
 4. Master Key System: All locks operable by master key.
- D. Shelves in Cabinets:
 1. Shelf Standards and Rests: Vertical standards with rubber button fitted rests, satin chromium plated over nickel on base material.
- E. Wall-Mounted Shelving:
 1. Shelf Brackets: Vertical chrome steel standards with chrome steel arms.
- F. Swinging Doors:
 1. Hinges: Offset pin, number as required by referenced standards for width, height, and weight of door.
 - a. Butt Hinges for Inset Doors: five-knuckle, projecting barrel, minimum 2-1/2 inches long. Stainless steel with No. 4 finish.
 2. Catches: Magnetic.
 3. Pulls: Brushed aluminum wire pulls, 4 inches wide. Kewaunee "Pull Style 8."
 4. Drawers:
 - a. Pulls: Brushed aluminum wire pulls, 4 inches wide. Kewaunee "Pull Style 8."
 - b. Slides: Steel, full extension arms, ball bearings; self-closing; capacity as recommended by manufacturer for drawer height and width.

2.05 COUNTERTOPS

- A. Countertops:
 1. Types: More than one type is required, as specified below. See drawings for location of each type of countertop.
 2. Epoxy Resin Countertops: Filled epoxy resin molded into homogenous, non-porous sheets; no surface coating and color and pattern consistent throughout thickness; with integral or adhesively seamed components.
 - a. Flat Surface Thickness: 1 inch, nominal.

- b. Surface Finish: Smooth, non-glare.
- c. SSM-1 Color: Black.
- d. SSM-2 Color: Gray.
- e. Drip Edge: Drip groove 1/8 inch wide and deep, located 1/2 inch back from edge on underside of each exposed edge.
- f. Back and End Splashes: Same material, same thickness; separate for field attachment.
- g. Fabricate in accordance with AWMAC/WI (NAAWS), Section 11 - Countertops, Premium Grade.

2.06 SINKS

- A. Laboratory sinks.
 - 1. General: Manufacturer's adjustable support system for undermount sink installation.
 - 2. Sink types and sizes are indicated on drawings.
- B. Non-laboratory sinks are identified on drawings and are specified in Section 22 40 00.

2.07 SERVICE FITTINGS

- A. General: Comply with requirements of SEFA 7.
- B. Gas Service Fittings and Fixtures:
 - 1. Laboratory Gas Fitting :
 - a. Valve: Forged or cast brass body, 90 degree inlet - outlet configuration, with polished chrome with clear epoxy coating finish.
 - b. Control: Ball valve.
 - c. Mounting: Panel (vertical surface).
 - d. Supply Gas: Nitrogen.
 - e. Inlet: 3/8 inch NPS NPT.
 - f. Outlet: Manufacturer's standard, with removable seven-serration hose end.
 - 1) Number: One.
 - g. Handle: Manufacturer's standard four-arm Handle with color-coded index disc.
- C. Water Service Fittings and Fixtures:
 - 1. Water Fitting :
 - a. Valve: Forged or cast brass body, 180 degree inlet - outlet configuration, with polished chrome finish.
 - b. Mounting: Deck (horizontal surface) turret base, with escutcheon.
 - c. Inlet: 3/8 inch NPS NPT.
 - d. Outlet: Manufacturer's standard, with anti-splash serrated hose end.
 - 1) Number: Two.
 - e. Handle: Manufacturer's standard four-arm handle with color-coded index disc.
 - 2. Water, Single Faucet :
 - a. Valve: Forged or cast brass body, 180 degree inlet - outlet configuration, with polished chrome finish.
 - b. Mounting: Deck (horizontal surface) turret base.

- c. Inlet: 3/8 inch NPS NPT.
 - d. Gooseneck: Rigid gooseneck, with 6 inch spread, anti-splash serrated hose end.
 - e. Handle: Manufacturer's standard wrist-blade handle with color-coded index disc.
- D. Electrical Fittings and Fixtures:
- 1. Electrical Fittings, General: Types indicated, for mounting on laboratory casework, including, as appropriate, grounding screws, and mounting accessories and fasteners.
 - 2. Recessed Boxes: Plated steel.
- E. Control Valves for Fume Hoods: Remote-type valves as specified above, except provide complete with aluminum extension rods and escutcheon plates,

2.08 MATERIALS

- A. Adhesives Used for Assembly: Comply with VOC limitation requirements for adhesives and sealants as specified in Section 01 61 16.
- 1. Adhesives used shall be Type II.
- B. Lumber shall be in accordance with the "Architectural Woodwork Standards" Grade specified and the product being fabricated. Moisture content shall be 6% to 12% for boards up to two inch nominal thickness, and shall not exceed 19% for thicker pieces.
- C. Wood-Based Materials:
- 1. Solid Wood: Air-dried to 4.5 percent moisture content, then tempered to 6 percent moisture content before use.
 - 2. Composite Wood Panels: Containing no urea-formaldehyde resin binders.
- D. Exposed Solid Wood: Clear, dry, sound, plain sawn, selected for compatible grain and color, no defects.
- E. Exposed Hardwood Plywood: veneer core; same species as exposed solid wood, non-telegraphing, clear, compatible grain and color, no defects. Band exposed edges with solid wood of same species as veneer.
- F. Semi-Exposed Solid Wood: Dry, sound, plain sawn, no appearance defects, any species similar in color and grain to exposed portions.
- G. Semi-Exposed Hardwood Plywood: Veneer core; HPVA HP-1 Grade C, Type I; plain sliced, any species similar in color and grain to exposed portions.
- H. Concealed Solid Wood or Plywood: Any species and without defects affecting strength or utility.
- I. Hardboard: ANSI A135.4, Class 1, tempered. 1/4 inch thick, 55 lb.
- J. Solid Epoxy Resin: Modified epoxy resin and non-asbestos inert fillers cast into sheets.
- K. Glass: Fully tempered float; ASTM C1036, Type 1, Quality Q3; ASTM C1048, tempered using horizontal tempering and complying with ANSI Z97.1; 3/16 inch thick minimum; exposed edges ground, and cut or drilled to receive hardware; clear.
- 1. Glass used for unframed sliding doors, shall be 1/4 inch tempered glass
- L. Base Molding: Topset cove type, 4 inch high with adhesive backing. See Section 09 65 00 - Resilient Flooring.
- M. Sealant for Use in Casework Installation:

1. Manufacturer's recommended type.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Site Verification of Environmental Conditions:
 1. Do not deliver casework until the following conditions have been met:
 - a. Building has been enclosed (windows and doors sealed and weather-tight).
 - b. An operational HVAC system that maintains temperature and humidity at occupancy levels has been put in place.
 - c. Ceiling, overhead ductwork, piping, and lighting have been installed.
 - d. Installation areas do not require further "wet work" construction.
- B. Verify adequacy of support framing and anchors.
- C. Verify that service connections are correctly located and of proper characteristics.

3.02 INSTALLATION

- A. Complete upgrades and modifications as indicated on Drawings and Section 01 73 56 - Alteration and Modernization Execution Procedures.
- B. Perform installation in accordance with manufacturer's instructions and with SEFA 2.
- C. Install all work in conformance with the Architectural Woodwork Standards, latest edition.
 1. Installation shall conform to the AWS Grade of the items being installed.
- D. Use anchoring devices to suit conditions and substrate materials encountered. Use concealed fasteners to the greatest degree possible. Use exposed fasteners only where allowed by approved shop drawings, or where concealed fasteners are impracticable.
- E. Set casework items plumb and square, securely anchored to building structure.
 1. Base Cabinets: Examine floor levelness and flatness of installation space. Do not proceed with installation if encountered floor conditions required more than 3/4 inch leveling adjustment. When installation conditions are acceptable, for each space, establish the high point of the floor. Set and make level and plumb first cabinet in relation to this high point.
 2. Wall Cabinets: Examine wall surfaces in installation space. Do not proceed with installation if the following conditions are encountered:
 - a. Maximum variation from plane of masonry wall exceeds 1/4 inch in 10 ft and 1/2 inch in 20 ft or more, and/or maximum variation from plumb exceeds 1/4 inch per story.
 - b. Maximum Variation of finished gypsum board surface from true flatness exceeds 1/8 inch in 10 feet in any direction.
- F. Align cabinets to adjoining components, install filler and/or scribe panels where necessary to close gaps.
 1. All work abutting other building components shall be properly scribed.

- G. Fasten together cabinets in continuous runs, with joints flush, uniform and tight. Misalignment of adjacent units not to exceed 1/16 inch. In addition, do not exceed the following tolerances:
 - 1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
 - 2. Variation of Bottoms of Upper Cabinets from Level: 1/8 inch in 10 feet.
 - 3. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
 - 4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
 - 5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.
- H. Secure upper and floor cabinets to concealed reinforcement at gypsum board assemblies.
- I. Separate dissimilar metals to prevent galvanic action.
- J. Base Cabinets: Fasten cabinets to service space framing and/or wall substrates, with fasteners spaced not more than 16 inches on center. Bolt adjacent cabinets together with joints flush, tight, and uniform.
 - 1. Where base cabinets are installed away from walls or service space framing, anchor to floor at toe space at not more than 24 inches on center, and at sides of cabinets with not less than two fasteners per side.
- K. Wall Cabinets: Fasten to hanging strips, and/or wall substrates. Fasten each cabinet through back, near top, at not less than 16 inches on center.
- L. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.
- M. Holes and cutouts for plumbing and electrical fixtures shall be cut by the millwork trade. Fixtures included in this section shall be delivered to the plumbing and electrical trades for installation.
- N. Sink installation: Set in chemical-resistant sealing compound, secured and supported per manufacturer's recommendations.
- O. Fume hoods shall be set in place and firmly secured, ready for connection to wiring and vents.
- P. Countertops: Install countertops in one true plane, with ends abutting at hairline joints, and no raised edges.
- Q. Install accessories and fittings in accordance with manufacturer's recommendations. Turn screws to seat flat; do not drive.
- R. Replace units that are damaged, including those that have damaged finishes.

3.03 TOLERANCES

- A. Alignment of adjacent units: maximum 1/16 inch.
- B. Abut top edge surfaces in one true plane. Flush joints: 1/8 inch maximum between top units.

3.04 ADJUSTING

- A. Adjust operating parts, including doors, drawers, hardware, and fixtures to function smoothly.

3.05 CLEANING

- A. Clean casework and other installed surfaces thoroughly.

3.06 PROTECTION

- A. Do not permit finished casework to be exposed to continued construction activity.
- B. Protect casework and countertops from ongoing construction activities. Prevent installers from standing on or storing tools and materials on casework or countertops.
- C. Repair damage that occurs prior to Date of Substantial Completion, including finishes, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

END OF SECTION

SECTION 12 61 10
FIXED LECTURE SEATING

PART 1 GENERAL

1.01 SUMMARY

- A. Work Included in this section: Provision of cushioned floor-mounted fixed Jury Base seating including attachment, or other work required for installation unless otherwise noted.

1.02 SUBMITTALS

- A. Field Verification - Shop drawings incorporate building information compiled from various sources associated with this project and deemed as reliable. Conditions directly affecting the product or its installation must be field verified.
- B. Drawing Review - Shop drawings are produced to assure compliance with the contract. Drawings must be reviewed by the Owner/Architect/Contractor, or other appropriate owner's representative. If drawings are correct, mark them as such; if incorrect, note corrections to be made and return to KI for corrections. Any deviations from the contract included in the shop drawing must be approved in writing from the Owner/Architect/Contractor. Drawing must be signed by authorized personnel including title, company or affiliation, and date. Manufacture of product shown is not scheduled until drawing review is complete and an authorized signature is received.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Store delivered in clean, safe, dry area.

1.04 SCHEDULING

- A. Schedule installation of items to occur after application of exposed finishes wherever installation will not damage exposed finish surfaces and completion of finishes will not impede installation.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturer: KI
- B. Product: Jury Base Seating.
- C. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DESCRIPTION

- A. "Jury Base Seating" is manufactured by KI, Green Bay, WI.
 - 1. Seating is floor-mounted on flat or sloped floors. Seat shells swivel for ease in entry and exit and have an automatic memory return.
- B. Floor-mounted steel bases with 360 degree swivel and automatic memory return including but not limited to:
 - 1. Square (Basic) column bases for mounting to flat or sloped floors.

2. Powder-coated steel frames provide maximum durability.

2.03 CONSTRUCTION

A. Frames

1. Standard Square Column (Basic) Jury Base pedestal frames are available for Apply, Grazie, Strive, Torsion, Torsion Air, and Wave shells (without provision for a writing surface). The column is a three-piece construction and consists of an 11-gauge round steel housing welded to a 14-gauge square column and welded to an 11-gauge 6" x 8" rectangular floor plate. The die-formed steel floor plate fastens to the floor through 1/2" holes pierced in each corner to accommodate four floor anchors. The seat swivels on a 3/4" diameter carbon steel shaft welded to the 11-gauge steel support bell and the formed steel seat spider. The shaft is inserted into the cam operated return mechanism, which springs compressed between molded engineering plastics. The contact between the top cam and the bottom cam controls the rotation. Standard rotation is 360 degrees. A plastic molded escutcheon cover will cover the floor plate.
2. Standard rotation is 360 degrees. A plastic molded escutcheon cover will cover the floor plate.
3. Standard rotation is 360 degrees and height adjustment 3.6". A plastic molded escutcheon cover will cover the floor plate.

B. Shells:

1. Intellect Wave®
 - a. One-piece contoured shell is constructed of high-impact polypropylene. Colorfastness is ensured through complete color impregnation throughout the molded part. Strength and durability are ensured through an engineered internal structural cavity which eliminates the need for unsightly ribs on the back of the shell. Rolled edges provide comfort and strength. Front and back are textured. Wide, ergonomic handle is molded into the chair back for ease of mobility. The shell fastens to the 12-gauge steel seat spider with six
 - b. 1/4 -20 x 5/8" screws. Intellect Wave is available with an upholstered seat or an upholstered seat and back. Upholstered chairs have partially exposed polypropylene surfaces. Fabric is upholstered over 9/16" foam on the back and seat and fasted to an inner shell with screws. Back upholstery covers handle.

2.04 ACCESSORIES

- A. Tablet with Arm: K2 Oversize.

2.05 FINISHES

- A. Shell Color: As selected by Architect.
- B. Frame Finishes – Baked-on electrostatically-applied powder-coat paint is standard on all frames. All finishes and colors to be selected by architect. Refer to KI Color Addendum for standard finishes. Custom colors and finishes available; contact factory.

2.06 COMPLIANCE

- A. "Jury Base Seating" is designed and manufactured in compliance with the intent of ANSI/BIFMA X5.4-2012. Seating exceeds all applicable BIFMA performance test criteria. Jury Base seating is SCS Indoor Air Quality certified.

PART 3 EXECUTION

3.01 PREPARATION

- A. Coordination details with other work supporting, adjoining, or otherwise contracting items as required to insure proper installation.
- B. Examine construction to verify that:
- C. Dimensions are correct to manufacturer's specifications.
- D. Do not install items until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install items in strict accordance to manufacturer's Assembly Instructions and approved Shop Drawings.

3.03 FLOOR MOUNTING REQUIREMENTS

- A. Minimum Floor Construction Required for Upright Installation:
 - 1. Concrete Floors
 - a. 3000 psi concrete compressive strength
 - b. 3" thick free of obstructions for 1-1/2"
 - c. 4" thick free of obstructions for 2-1/2" for riser mount
 - d. Riser to be plumb within 1/8 degree
 - e. Minimum anchor embedment 1-1/2"
- B. Floor Fastener Requirements
 - 1. Concrete Floors
 - a. 1/4" x 2-5/8" Hilti KH-EZ
 - b. Max. torque: 18 ft lb
 - c. Four anchor assemblies required per base

END OF SECTION

SECTION 22 05 17
SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Sleeve-seal systems.
 - 3. Sleeve-seal fittings.
 - 4. Grout.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.01 SLEEVES

- A. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.
- B. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- C. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

2.02 SLEEVE-SEAL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Advance Products & Systems, Inc.
 - 2. CALPICO, Inc.
 - 3. Metraflex Company (The).
 - 4. Pipeline Seal and Insulator, Inc.
 - 5. Proco Products, Inc.
- B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
 - 1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 - 2. Pressure Plates: Carbon steel.

3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.03 SLEEVE-SEAL FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Presealed Systems.
- B. Description: Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall. Unit has plastic or rubber waterstop collar with center opening to match piping OD.

2.04 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.01 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch (25-mm) annular clear space between piping and concrete slabs and walls.
 1. Sleeves are not required for core-drilled holes.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 1. Permanent sleeves are not required for holes in slabs formed by molded-PE or -PP sleeves.
 2. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches (50 mm) above finished floor level.
 3. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- D. Install sleeves for pipes passing through interior partitions.
 1. Cut sleeves to length for mounting flush with both surfaces.
 2. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation.
 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Section 07 92 00 "Joint Sealants."

- E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.

3.02 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.03 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

3.04 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
 - 1. Exterior Concrete Walls above Grade:
 - a. Piping Smaller Than NPS 6 (DN 150): Galvanized-steel-pipe sleeves.
 - 2. Exterior Concrete Walls below Grade:
 - a. Piping Smaller Than NPS 6 (DN 150): Galvanized-steel wall sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch (25-mm) annular clear space between piping and sleeve for installing sleeve-seal system.
 - 3. Concrete Slabs-on-Grade:
 - a. Piping Smaller Than NPS 6 (DN 150): Galvanized-steel wall sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch (25-mm) annular clear space between piping and sleeve for installing sleeve-seal system.
 - 4. Interior Partitions:
 - a. Piping Smaller Than NPS 6 (DN 150): Galvanized-steel-pipe sleeves.

END OF SECTION

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SECTION 22 05 18
ESCUTCHEONS FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.01 ESCUTCHEONS

- A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of insulated piping and with OD that completely covers opening.
 - 1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
 - b. Chrome-Plated Piping: One-piece, cast-brass type with polished, chrome-plated finish.
 - c. Insulated Piping: One-piece, stamped-steel type.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
 - e. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type.
 - f. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
 - g. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass type with polished, chrome-plated finish.

3.02 FIELD QUALITY CONTROL

- A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION

SECTION 22 05 19
METERS AND GAGES FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Bimetallic-actuated thermometers.
 - 2. Liquid-in-glass thermometers.
 - 3. Thermowells.
 - 4. Dial-type pressure gages.
 - 5. Test plugs.
- B. Related Sections:
 - 1. Division 22 Section " Domestic Water Piping" for water meters inside the building.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.04 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of meter and gage, from manufacturer.

1.05 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For meters and gages to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.01 BIMETALLIC-ACTUATED THERMOMETERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Trerice, H. O. Co.
 - 2. Watts Regulator Co.; a div. of Watts Water Technologies, Inc.
 - 3. Weiss Instruments, Inc.
- B. Standard: ASME B40.200.
- C. Case: Liquid-filled and sealed type(s); stainless steel with 3-inch (76-mm) nominal diameter.
- D. Dial: Nonreflective aluminum with permanently etched scale markings and scales in deg F (deg C).

- E. Connector Type(s): Union joint, rigid, back and rigid, bottom, with unified-inch screw threads.
- F. Connector Size: 1/2 inch (13 mm), with ASME B1.1 screw threads.
- G. Stem: 0.25 or 0.375 inch (6.4 or 9.4 mm) in diameter; stainless steel.
- H. Window: Plain glass.
- I. Ring: Stainless steel.
- J. Element: Bimetal coil.
- K. Pointer: Dark-colored metal.
- L. Accuracy: Plus or minus 1 percent of scale range.

2.02 LIQUID-IN-GLASS THERMOMETERS

- A. Metal-Case, Industrial-Style, Liquid-in-Glass Thermometers:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Terice, H. O. Co.
 - b. Weiss Instruments, Inc.
 - c. Or approved equal.
 2. Standard: ASME B40.200.
 3. Case: Cast aluminum; 7-inch (178-mm) nominal size unless otherwise indicated.
 4. Case Form: Straight unless otherwise indicated.
 5. Tube: Glass with magnifying lens and blue or red organic liquid.
 6. Tube Background: Nonreflective aluminum with permanently etched scale markings graduated in deg F (deg C).
 7. Window: Glass.
 8. Stem: Aluminum and of length to suit installation.
 - a. Design for Thermowell Installation: Bare stem.
 9. Connector: 1-1/4 inches (32 mm), with ASME B1.1 screw threads.
 10. Accuracy: Plus or minus 1 percent of scale range or one scale division, to a maximum of 1.5 percent of scale range.

2.03 THERMOWELLS

- A. Thermowells:
 1. Standard: ASME B40.200.
 2. Description: Pressure-tight, socket-type fitting made for insertion into piping tee fitting.
 3. Material for Use with Copper Tubing: CNR.
 4. Material for Use with Steel Piping: CRES.
 5. Type: Stepped shank unless straight or tapered shank is indicated.
 6. External Threads: NPS 1/2, NPS 3/4, or NPS 1, (DN 15, DN 20, or NPS 25,) ASME B1.20.1 pipe threads.

7. Internal Threads: 1/2, 3/4, and 1 inch (13, 19, and 25 mm), with ASME B1.1 screw threads.
 8. Bore: Diameter required to match thermometer bulb or stem.
 9. Insertion Length: Length required to match thermometer bulb or stem.
 10. Lagging Extension: Include on thermowells for insulated piping and tubing.
 11. Bushings: For converting size of thermowell's internal screw thread to size of thermometer connection.
- B. Heat-Transfer Medium: Mixture of graphite and glycerin.

2.04 PRESSURE GAGES

- A. Direct-Mounted, Metal-Case, Dial-Type Pressure Gages:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AMETEK, Inc.; U.S. Gauge.
 - b. Watts Regulator Co.; a div. of Watts Water Technologies, Inc.
 - c. Weiss Instruments, Inc.
 2. Standard: ASME B40.100.
 3. Case: Liquid-filled type(s); cast aluminum or drawn steel; 4-1/2-inch (114-mm) nominal diameter.
 4. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.
 5. Pressure Connection: Brass, with NPS 1/4 or NPS 1/2 (DN 8 or DN 15), ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.
 6. Movement: Mechanical, with link to pressure element and connection to pointer.
 7. Dial: Nonreflective aluminum with permanently etched scale markings graduated in psi (kPa).
 8. Pointer: Dark-colored metal.
 9. Window: Glass.
 10. Ring: Metal.
 11. Accuracy: Grade A, plus or minus 1 percent of middle half of scale range.

2.05 TEST PLUGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Terice, H. O. Co.
 2. Watts Regulator Co.; a div. of Watts Water Technologies, Inc.
 3. Weiss Instruments, Inc.
- B. Description: Test-station fitting made for insertion into piping tee fitting.
- C. Body: Brass or stainless steel with core inserts and gasketed and threaded cap. Include extended stem on units to be installed in insulated piping.
- D. Thread Size: NPS 1/4 (DN 8) or NPS 1/2 (DN 15), ASME B1.20.1 pipe thread.

- E. Minimum Pressure and Temperature Rating: 500 psig at 200 deg F (3450 kPa at 93 deg C).
- F. Core Inserts: Chlorosulfonated polyethylene synthetic and EPDM self-sealing rubber.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install thermowells with socket extending to center of pipe and in vertical position in piping tees.
- B. Install thermowells of sizes required to match thermometer connectors. Include bushings if required to match sizes.
- C. Install thermowells with extension on insulated piping.
- D. Fill thermowells with heat-transfer medium.
- E. Install direct-mounted thermometers in thermowells and adjust vertical and tilted positions.
- F. Install remote-mounted thermometer bulbs in thermowells and install cases on panels; connect cases with tubing and support tubing to prevent kinks. Use minimum tubing length.
- G. Install direct-mounted pressure gages in piping tees with pressure gage located on pipe at the most readable position.
- H. Install remote-mounted pressure gages on panel.
- I. Install valve and snubber in piping for each pressure gage for fluids.
- J. Install test plugs in piping tees.
- K. Install thermometers in the following locations:
 - 1. Inlet and outlet of each water heater.
- L. Install pressure gages in the following locations:
 - 1. Building water service entrance into building.
 - 2. Inlet and outlet of each pressure-reducing valve.
 - 3. Suction and discharge of each domestic water pump.

3.02 CONNECTIONS

- A. Install meters and gages adjacent to machines and equipment to allow service and maintenance of meters, gages, machines, and equipment.

3.03 ADJUSTING

- A. Adjust faces of meters and gages to proper angle for best visibility.

3.04 THERMOMETER SCHEDULE

- A. Thermometers at inlet and outlet of each domestic water heater shall be one of the following:
 - 1. Liquid-filled, bimetallic-actuated type.
 - 2. Direct-mounted, metal-case, vapor-actuated type.
 - 3. Industrial-style, liquid-in-glass type.
 - 4. Direct-mounted, light-activated type.
 - 5. Test plug with chlorosulfonated polyethylene synthetic self-sealing rubber inserts.

- B. Thermometer stems shall be of length to match thermowell insertion length.

3.05 THERMOMETER SCALE-RANGE SCHEDULE

- A. Scale Range for Domestic Cold-Water Piping: 0 to 150 deg F (Minus 20 to plus 70 deg C).
- B. Scale Range for Domestic Hot-Water Piping: 0 to 250 deg F (0 to 150 deg C).

3.06 PRESSURE-GAGE SCHEDULE

- A. Pressure gages at discharge of each water service into building shall be the following:
 - 1. Liquid-filled, direct -mounted, metal case.
 - 2. Test plug with chlorosulfonated polyethylene synthetic self-sealing rubber inserts.
- B. Pressure gages at inlet and outlet of each water pressure-reducing valve shall be the following:
 - 1. Liquid-filled Solid-front, pressure-relief, direct-mounted, metal case.
 - 2. Test plug with chlorosulfonated polyethylene synthetic self-sealing rubber inserts.
- C. Pressure gages at suction and discharge of each domestic water pump shall be the following:
 - 1. Liquid-filled, direct-mounted, metal case.
 - 2. Test plug with chlorosulfonated polyethylene synthetic self-sealing rubber inserts.

3.07 PRESSURE-GAGE SCALE-RANGE SCHEDULE

- A. Scale Range for Water Service Piping: 0 to 160 psi (0 to 1100 kPa).
- B. Scale Range for Domestic Water Piping: 0 to 160 psi (0 to 1100 kPa).

END OF SECTION

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SECTION 22 05 23
GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Bronze ball valves.
 - 2. Bronze swing check valves.
 - 3. Lubricated plug valves.
- B. Related Sections:
 - 1. Section 22 05 53 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.
 - 2. Section 22 11 16 "Domestic Water Piping" for valves applicable only to this piping.
 - 3. Section 22 13 19 "Sanitary Waste Piping Specialties" for valves applicable only to this piping.

1.03 DEFINITIONS

- A. CWP: Cold working pressure.
- B. EPDM: Ethylene propylene copolymer rubber.
- C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
- D. NRS: Nonrising stem.
- E. OS&Y: Outside screw and yoke.
- F. RS: Rising stem.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of valve indicated.

1.05 QUALITY ASSURANCE

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 2. ASME B31.1 for power piping valves.
 - 3. ASME B31.9 for building services piping valves.
- C. NSF Compliance: NSF 61 for valve materials for potable-water service.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, grooves, and weld ends.
 - 3. Set angle, and globe valves closed to prevent rattling.
 - 4. Set ball and plug valves open to minimize exposure of functional surfaces.
 - 5. Block check valves in either closed or open position.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.
 - 2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR VALVES

- A. Refer to valve schedule articles for applications of valves.
- B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- C. Valve Sizes: Same as upstream piping unless otherwise indicated.
- D. Valve Actuator Types:
 - 1. Handlever: For quarter-turn valves NPS 6 (DN 150) and smaller except plug valves.
 - 2. Wrench: For plug valves with square heads. Furnish Owner with 1 wrench for every 5 plug valves, for each size square plug-valve head.
- E. Valves in Insulated Piping: With 2-inch (50-mm) stem extensions and the following features:
 - 1. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
- F. Valve-End Connections:
 - 1. Flanged: With flanges according to ASME B16.1 for iron valves.
 - 2. Grooved: With grooves according to AWWA C606.
 - 3. Threaded: With threads according to ASME B1.20.1.
- G. Valve Bypass and Drain Connections: MSS SP-45.

2.02 BRONZE BALL VALVES

- A. Three-Piece, Full-Port, Bronze Ball Valves with Stainless-Steel Trim:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Conbraco Industries, Inc.; Apollo Valves.
 - b. Hammond Valve.
 - c. Milwaukee Valve Company.
 - d. NIBCO INC.
2. Description:
- a. Standard: MSS SP-110.
 - b. SWP Rating: 150 psig (1035 kPa).
 - c. CWP Rating: 600 psig (4140 kPa).
 - d. Body Design: Three piece.
 - e. Body Material: Bronze.
 - f. Ends: Threaded.
 - g. Seats: PTFE or TFE.
 - h. Stem: Stainless steel.
 - i. Ball: Stainless steel, vented.
 - j. Port: Full.

2.03 BRONZE SWING CHECK VALVES

A. Class 150, Bronze Swing Check Valves with Nonmetallic Disc:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Milwaukee Valve Company.
 - b. NIBCO INC.
 - c. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
- 2. Description:
 - a. Standard: MSS SP-80, Type 4.
 - b. CWP Rating: 300 psig (2070 kPa).
 - c. Body Design: Horizontal flow.
 - d. Body Material: ASTM B 62, bronze.
 - e. Ends: Threaded.
 - f. Disc: PTFE or TFE.

2.04 LUBRICATED PLUG VALVES

A. Class 125, Cylindrical, Lubricated Plug Valves with Threaded Ends:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Homestead Valve; a division of Olson Technologies, Inc.
 - b. Milliken Valve Company.

- c. R & M Energy Systems; a unit of Robbins & Myers, Inc.
- 2. Description:
 - a. Standard: MSS SP-78, Type IV.
 - b. CWP Rating: 200 psig (1380 kPa).
 - c. Body Material: ASTM A 48/A 48M or ASTM A 126, cast iron with lubrication-sealing system.
 - d. Pattern: Regular or short.
 - e. Plug: Cast iron or bronze with sealant groove.
- B. Class 125, Cylindrical, Lubricated Plug Valves with Flanged Ends:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Homestead Valve; a division of Olson Technologies, Inc.
 - b. Milliken Valve Company.
 - c. R & M Energy Systems; a unit of Robbins & Myers, Inc.
 - 2. Description:
 - a. Standard: MSS SP-78, Type IV.
 - b. CWP Rating: 200 psig (1380 kPa).
 - c. Body Material: ASTM A 48/A 48M or ASTM A 126, cast iron with lubrication-sealing system.
 - d. Pattern: Regular or short.
 - e. Plug: Cast iron or bronze with sealant groove.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.02 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.

- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.
- E. Install check valves for proper direction of flow and as follows:
 - 1. Swing Check Valves: In horizontal position with hinge pin level.
 - 2. Plate-Type Check Valves: In horizontal or vertical position, between flanges.
 - 3. Lift Check Valves: With stem upright and plumb.

3.03 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.04 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valve applications are not indicated, use the following:
 - 1. Shutoff Service: Ball, valves.
 - 2. Throttling Service: Globe or ball valves.
 - 3. Pump-Discharge Check Valves:
 - a. NPS 2 (DN 50) and Smaller: Bronze swing check valves with disc.
 - b. NPS 2-1/2 (DN 65) and Larger for Domestic Water: Bronze swing check valve with bronze disc.
 - c. NPS 2-1/2 (DN 65) and Larger for Sanitary Waste and Storm Drainage: Bronze swing check valve with bronze disc.
- B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.
- C. Select valves, except wafer types, with the following end connections:
 - 1. For Copper Tubing, NPS 2 (DN 50) and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
 - 2. For Copper Tubing, NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 3. For Copper Tubing, NPS 5 (DN 125) and Larger: Flanged ends.

3.05 LOW-PRESSURE, COMPRESSED-AIR VALVE SCHEDULE (150 PSIG (1035 kPa) OR LESS)

- A. Pipe NPS 2 (DN 50) and Smaller:
 - 1. Bronze Valves: May be provided with solder-joint ends instead of threaded ends.
 - 2. Ball Valves: Three piece, full port, bronze with stainless-steel trim.
 - 3. Bronze Lift Check Valves: Class 125, bronze disc.
 - 4. Bronze Swing Check Valves: Class 125, bronze disc.

END OF SECTION

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SECTION 22 05 29

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 1. Metal pipe hangers and supports.
 2. Trapeze pipe hangers.
 3. Metal framing systems.
 4. Fastener systems.
 5. Equipment supports.
- B. Related Sections:
 1. Section 05 50 00 "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
 2. Section 22 05 48 "Vibration and Seismic Controls for Plumbing Piping and Equipment" for vibration isolation devices.

1.03 DEFINITIONS

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.04 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
 1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
 2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
 3. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

1.05 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

- B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following; include Product Data for components:
 - 1. Trapeze pipe hangers.
 - 2. Metal framing systems.
 - 3. Equipment supports.

1.06 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.07 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.01 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
 - 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 - 2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
 - 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
 - 4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
 - 5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

2.02 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.03 METAL FRAMING SYSTEMS

- A. MFMA Manufacturer Metal Framing Systems:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cooper B-Line, Inc.
 - b. Flex-Strut Inc.
 - c. Unistrut Corporation; Tyco International, Ltd.
 - 2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
 - 3. Standard: MFMA-4.

4. Channels: Continuous slotted steel channel with inturred lips.
5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
7. Metallic Coating: Hot-dipped galvanized.
8. Paint Coating: Vinyl.
9. Plastic Coating: PVC.

2.04 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.05 PIPE STANDS

- A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
- B. Low-Type, Single-Pipe Stand: One-piece stainless-steel base unit with plastic roller, for roof installation without membrane penetration.
- C. High-Type, Single-Pipe Stand:
 1. Description: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
 2. Base: Stainless steel.
 3. Vertical Members: Two or more cadmium-plated-steel or stainless-steel, continuous-thread rods.
 4. Horizontal Member: Cadmium-plated-steel or stainless-steel rod with plastic or stainless-steel, roller-type pipe support.
- D. High-Type, Multiple-Pipe Stand:
 1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
 2. Bases: One or more; plastic.
 3. Vertical Members: Two or more protective-coated-steel channels.
 4. Horizontal Member: Protective-coated-steel channel.
 5. Pipe Supports: Galvanized-steel, clevis-type pipe hangers.
- E. Curb-Mounting-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.06 PIPE POSITIONING SYSTEMS

- A. Description: IAPMO PS 42, positioning system of metal brackets, clips, and straps for positioning piping in pipe spaces; for plumbing fixtures in commercial applications.

2.07 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.08 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
 - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
 - 2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

PART 3 - EXECUTION

3.01 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.
- D. Fastener System Installation:
 - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches (100 mm) thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- E. Pipe Stand Installation:
 - 1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.

2. Curb-Mounted-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. See Section 07 72 00 "Roof Accessories" for curbs.
- F. Pipe Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture.
 - G. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
 - H. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
 - I. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
 - J. Install lateral bracing with pipe hangers and supports to prevent swaying.
 - K. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 (DN 65) and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
 - L. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
 - M. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
 - N. Insulated Piping:
 1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN 100) and larger if pipe is installed on rollers.
 3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN 100) and larger if pipe is installed on rollers.
 4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2 (DN 8 to DN 90): 12 inches (305 mm) long and 0.048 inch (1.22 mm) thick.
 - b. NPS 4 (DN 100): 12 inches (305 mm) long and 0.06 inch (1.52 mm) thick.

5. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.02 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.03 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.04 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches (40 mm).

3.05 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils (0.05 mm).
- B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Section 09 91 23 "Interior Painting."
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.06 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports, metal trapeze pipe hangers and metal framing systems and attachments for general service applications.
- F. Use padded hangers for piping that is subject to scratching.
- G. Use thermal-hanger shield inserts for insulated piping and tubing.
- H. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30 (DN 15 to DN 750).
 2. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36 (DN 20 to DN 900), requiring clamp flexibility and up to 4 inches (100 mm) of insulation.
 3. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 (DN 15 to DN 600) if little or no insulation is required.
 4. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4 (DN 15 to DN 100), to allow off-center closure for hanger installation before pipe erection.
 5. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8 (DN 20 to DN 200).
 6. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8 (DN 15 to DN 200).
 7. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8 (DN 15 to DN 200).
 8. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8 (DN 15 to DN 200).
 9. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8 (DN 10 to DN 200).
 10. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3 (DN 10 to DN 80).
 11. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30 (DN 15 to DN 750).
 12. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
 13. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2 to NPS 36 (DN 65 to DN 900) if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.

14. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30 (DN 25 to DN 750), from two rods if longitudinal movement caused by expansion and contraction might occur.
 15. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes NPS 2-1/2 to NPS 24 (DN 65 to DN 600), from single rod if horizontal movement caused by expansion and contraction might occur.
 16. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 (DN 50 to DN 1050) if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
 17. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 (DN 50 to DN 600) if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
 18. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 (DN 50 to DN 750) if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.
- I. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24 (DN 24 to DN 600).
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 (DN 20 to DN 600) if longer ends are required for riser clamps.
- J. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.
 2. Steel Clevises (MSS Type 14): For 120 to 450 deg F (49 to 232 deg C) piping installations.
 3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F (49 to 232 deg C) piping installations.
- K. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.

6. C-Clamps (MSS Type 23): For structural shapes.
 7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb (340 kg).
 - b. Medium (MSS Type 32): 1500 lb (680 kg).
 - c. Heavy (MSS Type 33): 3000 lb (1360 kg).
 13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- L. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- M. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- N. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
- O. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.
- P. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION

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SECTION 22 05 48

VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Pipe-riser resilient supports.
 - 2. Restraint channel bracings.
 - 3. Restraint cables.
 - 4. Seismic-restraint accessories.
 - 5. Mechanical anchor bolts.
- B. Related Requirements:
 - 1. Section 23 05 48 "Vibration and Seismic Controls for HVAC" for devices for HVAC equipment and systems.

1.03 DEFINITIONS

- A. IBC: International Building Code.
- B. ICC-ES: ICC-Evaluation Service.
- C. OSHPD: Office of Statewide Health Planning & Development (for the State of California).

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
 - 2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of vibration isolation device and seismic-restraint component required.
 - a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an agency acceptable to authorities having jurisdiction.
 - b. Annotate to indicate application of each product submitted and compliance with requirements.
- B. Shop Drawings:
 - 1. Detail fabrication and assembly of equipment bases. Detail fabrication including anchorages and attachments to structure and to supported equipment.

1.05 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Show coordination of vibration isolation device installation and seismic bracing for plumbing piping and equipment with other systems and equipment in the vicinity, including other supports and restraints, if any.
- B. Qualification Data: For professional engineer.
- C. Welding certificates.
- D. Field quality-control reports.

1.06 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7 and that is acceptable to authorities having jurisdiction.
- B. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPM number from OSHPD, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are unavailable, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Seismic-Restraint Loading:
 - 1. Assigned Seismic Use Group or Building Category as Defined in the IBC: II.
 - a. Component Importance Factor: 1.0.
 - b. Component Response Modification Factor: 2.5.
 - c. Component Amplification Factor: 2.5.
 - 2. Rated strengths, features, and applications shall be as defined in reports by an agency acceptable to authorities having jurisdiction.
 - a. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they are subjected.

2.02 RESTRAINT CHANNEL BRACINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper B-Line, Inc.
 - 2. Hilti, Inc.

3. Mason Industries, Inc.
- B. Description: MFMA-4, shop- or field-fabricated bracing assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; rated in tension, compression, and torsion forces.

2.03 MECHANICAL ANCHOR BOLTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Cooper B-Line, Inc.
 2. Hilti, Inc.
 3. Mason Industries, Inc.
- B. Mechanical Anchor Bolts: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and equipment to receive vibration isolation and seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 APPLICATIONS

- A. Hanger-Rod Stiffeners: Install hanger-rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.
- B. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength is adequate to carry present and future static and seismic loads within specified loading limits.

3.03 VIBRATION CONTROL AND SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Coordinate the location of embedded connection hardware with supported equipment attachment and mounting points and with requirements for concrete reinforcement and formwork specified in Section 03 30 00 "Cast-in-Place Concrete."
- B. Installation of vibration isolators must not cause any change of position of equipment, piping, or ductwork resulting in stresses or misalignment.
- C. Piping Restraints:
 1. Comply with requirements in MSS SP-127.
 2. Space lateral supports a maximum of 40 feet (12 m) o.c., and longitudinal supports a maximum of 80 feet (24 m) o.c.

3. Brace a change of direction longer than 12 feet (3.7 m).
- D. Install cables so they do not bend across edges of adjacent equipment or building structure.
- E. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction that provides required submittals for component.
- F. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.
- G. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- H. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- I. Drilled-in Anchors:
 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
 5. Set anchors to manufacturer's recommended torque, using a torque wrench.
 6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.04 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

- A. Install flexible connections in piping where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment. Comply with requirements in Section 22 11 16 "Domestic Water Piping" for piping flexible connections.

3.05 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections.
- C. Tests and Inspections:
 1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.

2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
 3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
 4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
 5. Test to 90 percent of rated proof load of device.
 6. Measure isolator restraint clearance.
 7. Measure isolator deflection.
 8. Verify snubber minimum clearances.
- D. Remove and replace malfunctioning units and retest as specified above.
- E. Prepare test and inspection reports.

3.06 ADJUSTING

- A. Adjust isolators after piping system is at operating weight.
- B. Adjust limit stops on restrained-spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

END OF SECTION

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SECTION 22 05 53
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Equipment labels.
 - 2. Warning signs and labels.
 - 3. Pipe labels.
 - 4. Stencils.
 - 5. Valve tags.
 - 6. Warning tags.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
- D. Valve numbering scheme.
- E. Valve Schedules: For each piping system to include in maintenance manuals.

1.04 COORDINATION

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.01 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
 - 1. Material and Thickness: Brass, 0.032-inch (0.8-mm) minimum thickness, and having predrilled or stamped holes for attachment hardware.
 - 2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).

3. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
 4. Fasteners: Stainless-steel rivets.
 5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Plastic Labels for Equipment:
1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch (3.2 mm) thick, and having predrilled holes for attachment hardware.
 2. Letter Color: White.
 3. Background Color: Green.
 4. Maximum Temperature: Able to withstand temperatures up to 160 deg F (71 deg C).
 5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).
 6. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
 7. Fasteners: Stainless-steel rivets or self-tapping screws.
 8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.
- D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch (A4) bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.02 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch (3.2 mm) thick, and having predrilled holes for attachment hardware.
- B. Letter Color: White.
- C. Background Color: Red.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F (71 deg C).
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).
- F. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel rivets or self-tapping screws.

- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.03 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
 - 1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
 - 2. Lettering Size: At least 1-1/2 inches (38 mm) high.

2.04 STENCILS

- A. Stencils: Prepared with letter sizes according to ASME A13.1 for piping; and minimum letter height of 3/4 inch (19 mm) for access panel and door labels, equipment labels, and similar operational instructions.
 - 1. Stencil Material: Aluminum.
 - 2. Stencil Paint: Exterior, gloss, alkyd enamel black unless otherwise indicated. Paint may be in pressurized spray-can form.
 - 3. Identification Paint: Exterior, alkyd enamel in colors according to ASME A13.1 unless otherwise indicated.

2.05 VALVE TAGS

- A. Valve Tags: Stamped or engraved with 1/4-inch (6.4-mm) letters for piping system abbreviation and 1/2-inch (13-mm) numbers.
 - 1. Tag Material: Brass, 0.032-inch (0.8-mm) minimum thickness, and having predrilled or stamped holes for attachment hardware.
 - 2. Fasteners: Brass wire-link or beaded chain; or S-hook.
- B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch (A4) bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
 - 1. Valve-tag schedule shall be included in operation and maintenance data.

2.06 WARNING TAGS

- A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.
 - 1. Size: Approximately 4 by 7 inches (100 by 178 mm).
 - 2. Fasteners: Brass grommet and wire.

3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
4. Color: Yellow background with black lettering.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

3.02 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

3.03 PIPE LABEL INSTALLATION

- A. Piping Color-Coding: Painting of piping is specified in Section 09 91 23 "Interior Painting."
- B. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels with painted, color-coded bands or rectangles, complying with ASME A13.1, on each piping system.
 1. Identification Paint: Use for contrasting background.
 2. Stencil Paint: Use for pipe marking.
- C. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 1. Near each valve and control device.
 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
 4. At access doors, manholes, and similar access points that permit view of concealed piping.
 5. Near major equipment items and other points of origination and termination.
 6. Spaced at maximum intervals of 50 feet (15 m) along each run. Reduce intervals to 25 feet (7.6 m) in areas of congested piping and equipment.
 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- D. Pipe Label Color Schedule:
 1. Low-Pressure, Compressed-Air Piping:
 - a. Background Color: Blue.
 - b. Letter Color: White.
 2. Domestic Water Piping:
 - a. Background Color: Green.

- b. Letter Color: White.
- 3. Sanitary Waste and Storm Drainage Piping:
 - a. Background Color: Green.
 - b. Letter Color: White.

3.04 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; shutoff valves; faucets; convenience and lawn-watering hose connections; and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:
 - 1. Valve-Tag Size and Shape:
 - a. Cold Water: 1-1/2 inches (38 mm), round.
 - b. Hot Water: 1-1/2 inches (38 mm), round.
 - c. Low-Pressure Compressed Air: 1-1/2 inches (38 mm), round.
 - 2. Valve-Tag Color:
 - a. Cold Water: Green.
 - b. Hot Water: Green.
 - c. Low-Pressure Compressed Air: Blue.
 - 3. Letter Color:
 - a. Cold Water: White.
 - b. Hot Water: White.
 - c. Low-Pressure Compressed Air: White.

3.05 WARNING-TAG INSTALLATION

- A. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION

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SECTION 22 07 19
PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes insulating the following plumbing piping services:
 - 1. Domestic hot-water piping.
 - 2. Domestic recirculating hot-water piping.
 - 3. Supplies and drains for handicap-accessible lavatories and sinks.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied, if any).
- B. LEED Submittals:
 - 1. Product Data for Credit IEQ 4.1: For adhesives and sealants, documentation including printed statement of VOC content and chemical components.
 - 2. Laboratory Test Reports for Credit IEQ 4: For adhesives and sealants, documentation indicating that product complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
 - 2. Detail attachment and covering of heat tracing inside insulation.
 - 3. Detail insulation application at pipe expansion joints for each type of insulation.
 - 4. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
 - 5. Detail removable insulation at piping specialties, equipment connections, and access panels.
 - 6. Detail application of field-applied jackets.
 - 7. Detail application at linkages of control devices.
- D. Samples: For each type of insulation and jacket indicated. Identify each Sample, describing product and intended use. Sample sizes are as follows:
 - 1. Preformed Pipe Insulation Materials: 12 inches long by NPS 2.
 - 2. Jacket Materials for Pipe: 12 inches long by NPS 2.
 - 3. Sheet Jacket Materials: 12 inches square.

4. Manufacturer's Color Charts: For products where color is specified, show the full range of colors available for each type of finish material.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
- C. Field quality-control reports.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.
- C. Mockups: Before installing insulation, build mockups for each type of insulation and finish listed below to demonstrate quality of insulation application and finishes. Build mockups in the location indicated or, if not indicated, as directed by Architect. Use materials indicated for the completed Work.
 1. Piping Mockups:
 - a. One 10-foot section of NPS 2 straight pipe.
 - b. One each of a 90-degree threaded, welded, and flanged elbow.
 - c. One each of a threaded, welded, and flanged tee fitting.
 - d. One NPS 2 or smaller valve, and one NPS 2-1/2 or larger valve.
 - e. Four support hangers including hanger shield and insert.
 - f. One threaded strainer and one flanged strainer with removable portion of insulation.
 - g. One threaded reducer and one welded reducer.
 - h. One pressure temperature tap.
 - i. One mechanical coupling.
 2. For each mockup, fabricate cutaway sections to allow observation of application details for insulation materials, adhesives, mastics, attachments, and jackets.
 3. Notify Architect seven days in advance of dates and times when mockups will be constructed.

4. Obtain Architect's approval of mockups before starting insulation application.
 5. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 7. Demolish and remove mockups when directed.
- D. Comply with the following applicable standards and other requirements specified for miscellaneous components:
1. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.07 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 22 05 29 "Hangers and Supports for Plumbing Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
- C. Coordinate installation and testing of heat tracing.

1.08 SCHEDULING

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.01 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

- E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
- F. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Pittsburgh Corning Corporation; Foamglas.
 - 2. Block Insulation: ASTM C 552, Type I.
 - 3. Special-Shaped Insulation: ASTM C 552, Type III.
 - 4. Preformed Pipe Insulation without Jacket: Comply with ASTM C 552, Type II, Class 1.
 - 5. Preformed Pipe Insulation with Factory-Applied ASJ: Comply with ASTM C 552, Type II, Class 2.
 - 6. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.
- G. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Aeroflex USA, Inc.; Aerocel.
 - b. Armacell LLC; AP Armaflex.
 - c. K-Flex USA; Insul-Lock, Insul-Tube, and K-FLEX LS.
- H. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 553, Type II and ASTM C 1290, Type I. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corp.; SoftTouch Duct Wrap.
 - b. Johns Manville; Microlite.
 - c. Manson Insulation Inc.; Alley Wrap.
- I. Mineral-Fiber, Preformed Pipe Insulation:
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Johns Manville; Micro-Lok.
 - b. Knauf Insulation; 1000-Degree Pipe Insulation.
 - c. Manson Insulation Inc.; Alley-K.
 - 2. Type I, 850 Deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, without factory-applied jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.02 INSULATING CEMENTS

- A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Ramco Insulation, Inc.; Super-Stik.
- B. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Ramco Insulation, Inc.; Ramcote 1200 and Quik-Cote.

2.03 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
- B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.
 - b. Eagle Bridges - Marathon Industries; 225.
 2. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 3. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.04 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
 1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-80/30-90.
 - b. Vimasco Corporation; 749.
 2. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
 3. Service Temperature Range: Minus 20 to plus 180 deg F.
 4. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
 5. Color: White.

2.05 LAGGING ADHESIVES

- A. Description: Comply with MIL-A-3316C, Class I, Grade A, and shall be compatible with insulation materials, jackets, and substrates.
 1. For indoor applications, use lagging adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 2. Products: Subject to compliance with requirements, provide one of the following:

- a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-50 AHV2.
 - b. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 30-36.
 - c. Vimasco Corporation; 713 and 714.
- 3. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over pipe insulation.
 - 4. Service Temperature Range: 0 to plus 180 deg F.
 - 5. Color: White.

2.06 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
 - 1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
 - 2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
 - 3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

2.07 FIELD-APPLIED FABRIC-REINFORCING MESH

- A. Woven Glass-Fiber Fabric: Approximately 2 oz./sq. yd. with a thread count of 10 strands by 10 strands/sq. in. for covering pipe and pipe fittings.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; Chil-Glas Number 10.

2.08 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
- B. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. ABI, Ideal Tape Division; 370 White PVC tape.
 - b. Compac Corporation; 130.
 - c. Venture Tape; 1506 CW NS.
 - 2. Width: 2 inches.
 - 3. Thickness: 6 mils.
 - 4. Adhesion: 64 ounces force/inch in width.
 - 5. Elongation: 500 percent.
 - 6. Tensile Strength: 18 lbf/inch in width.

2.09 SECUREMENTS

- A. Bands:
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. ITW Insulation Systems; Gerrard Strapping and Seals.
 - b. RPR Products, Inc.; Insul-Mate Strapping and Seals.
 - 2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316; 0.015 inch thick, 1/2 inch wide with closed seal.
 - 3. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing seal or closed seal.
- B. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.
- C. Wire: 0.080-inch nickel-copper alloy.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. C & F Wire.

2.10 PROTECTIVE SHIELDING GUARDS

- A. Protective Shielding Pipe Covers:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. McGuire Manufacturing.
 - b. Plumberex.
 - c. Truebro; a brand of IPS Corporation.
 - d. Zurn Industries, LLC; Tubular Brass Plumbing Products Operation.
 - 2. Description: Manufactured plastic wraps for covering plumbing fixture hot-water supply and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.
- B. Protective Shielding Piping Enclosures:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Truebro; a brand of IPS Corporation.
 - b. Zurn Industries, LLC; Tubular Brass Plumbing Products Operation.
 - 2. Description: Manufactured plastic enclosure for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with ADA requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 - 1. Verify that systems to be insulated have been tested and are free of defects.

2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Surface Preparation: Clean and prepare surfaces to be insulated. Before insulating, apply a corrosion coating to insulated surfaces as follows:
1. Stainless Steel: Coat 300 series stainless steel with an epoxy primer 5 mils thick and an epoxy finish 5 mils thick if operating in a temperature range between 140 and 300 deg F. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
 2. Carbon Steel: Coat carbon steel operating at a service temperature between 32 and 300 deg F with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.
- C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
- D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.03 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
1. Install insulation continuously through hangers and around anchor attachments.
 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.

3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
 4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Install insulation with factory-applied jackets as follows:
1. Draw jacket tight and smooth.
 2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
 - a. For below-ambient services, apply vapor-barrier mastic over staples.
 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- P. For above-ambient services, do not install insulation to the following:
1. Vibration-control devices.
 2. Testing agency labels and stamps.
 3. Nameplates and data plates.
 4. Cleanouts.

3.04 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.

3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
- C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 4. Seal jacket to wall flashing with flashing sealant.
- D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
- F. Insulation Installation at Floor Penetrations:
1. Pipe: Install insulation continuously through floor penetrations.

3.05 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
 3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.

5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
 6. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
 7. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
 8. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.
- D. Install removable insulation covers at locations indicated. Installation shall conform to the following:
1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
 2. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
 3. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
 4. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.06 INSTALLATION OF CELLULAR-GLASS INSULATION

- A. Insulation Installation on Straight Pipes and Tubes:
1. Secure each layer of insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
 2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.

3. For insulation with factory-applied jackets on above-ambient services, secure laps with outward clinched staples at 6 inches o.c.
 4. For insulation with factory-applied jackets on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.
- B. Insulation Installation on Pipe Fittings and Elbows:
1. Install preformed sections of same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
 2. When preformed sections of insulation are not available, install mitered sections of cellular-glass insulation. Secure insulation materials with wire or bands.
- C. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed sections of cellular-glass insulation to valve body.
 2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.

3.07 INSTALLATION OF MINERAL-FIBER INSULATION

- A. Insulation Installation on Straight Pipes and Tubes:
1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
 2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
 3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.
 4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.
- B. Insulation Installation on Pipe Fittings and Elbows:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
 2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.
- C. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
 2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
 3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
 4. Install insulation to flanges as specified for flange insulation application.

3.08 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform tests and inspections.
- C. Tests and Inspections:
 - 1. Inspect pipe, fittings, strainers, and valves, randomly selected by Architect, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.
- D. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

3.09 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 - 1. Drainage piping located in crawl spaces.
 - 2. Underground piping.
 - 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.10 INDOOR PIPING INSULATION SCHEDULE

- A. Domestic Hot and Recirculated Hot Water:
 - 1. NPS 1-1/4 and Smaller: Insulation shall be one of the following:
 - a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1/2 inch thick.
- B. Exposed Sanitary Drains, Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities:
 - 1. All Pipe Sizes: Insulation shall be one of the following:
 - a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1/2 inch thick.

END OF SECTION

SECTION 22 11 16
DOMESTIC WATER PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Under-building-slab and aboveground domestic water pipes, tubes, and fittings inside buildings.
 - 2. Encasement for piping.

1.03 ACTION SUBMITTALS

- A. Product Data: For transition fittings and dielectric fittings.

1.04 INFORMATIONAL SUBMITTALS

- A. System purging and disinfecting activities report.
- B. Field quality-control reports.

1.05 FIELD CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 - 1. Notify Construction Manager no fewer than two days in advance of proposed interruption of water service.
 - 2. Do not interrupt water service without Construction Manager's written permission.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.
- B. Potable-water piping and components shall comply with NSF 14 and NSF 61. Plastic piping components shall be marked with "NSF-pw."

2.02 COPPER TUBE AND FITTINGS

- A. Hard Copper Tube: ASTM B 88, Type L water tube, drawn temper.
- B. Copper Unions:
 - 1. MSS SP-123.
 - 2. Cast-copper-alloy, hexagonal-stock body.

3. Ball-and-socket, metal-to-metal seating surfaces.
4. Solder-joint.

2.03 ENCASEMENT FOR PIPING

- A. Standard: ASTM A 674 or AWWA C105/A21.5.
- B. Form: Sheet.
- C. Color: Natural.

2.04 TRANSITION FITTINGS

- A. General Requirements:
 1. Same size as pipes to be joined.
 2. Pressure rating at least equal to pipes to be joined.
 3. End connections compatible with pipes to be joined.
- B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
- C. Sleeve-Type Transition Coupling: AWWA C219.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cascade Waterworks Manufacturing.
 - b. Dresser, Inc.; Piping Specialties Products.
 - c. Ford Meter Box Company, Inc. (The).

2.05 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
- B. Dielectric Unions:
 1. Manufacturers: Subject to compliance with requirements, provide products by the following provide products by one of the following:
 - a. Capitol Manufacturing Company; member of the Phoenix Forge Group.
 - b. Watts; a division of Watts Water Technologies, Inc.
 - c. Wilkins; a Zurn company.
 2. Standard: ASSE 1079.
 3. Pressure Rating: 125 psig minimum at 180 deg F.
 4. End Connections: Solder-joint copper alloy and threaded ferrous.
- C. Dielectric Nipples:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Elster Perfection Corporation.
 - b. Grinnell Mechanical Products; Tyco Fire Products LP.

- c. Precision Plumbing Products, Inc.
- d. Victaulic Company.
- 2. Standard: IAPMO PS 66.
- 3. Electroplated steel nipple complying with ASTM F 1545.
- 4. Pressure Rating and Temperature: 300 psig at 225 deg F.
- 5. End Connections: Male threaded or grooved.
- 6. Lining: Inert and noncorrosive, propylene.

PART 3 - EXECUTION

3.01 EARTHWORK

- A. Comply with Division 33 requirements for excavating, trenching, and backfilling.

3.02 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."
- C. Install underground copper tube in PE encasement according to ASTM A 674 or AWWA C105/A21.5.
- D. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve inside the building at each domestic water-service entrance. Comply with requirements for pressure gages in Section 22 05 19 "Meters and Gages for Plumbing Piping" and with requirements for drain valves and strainers in Section 22 11 19 "Domestic Water Piping Specialties."
- E. Install shutoff valve immediately upstream of each dielectric fitting.
- F. Install water-pressure-reducing valves downstream from shutoff valves. Comply with requirements for pressure-reducing valves in Section 22 11 19 "Domestic Water Piping Specialties."
- G. Install domestic water piping level without pitch and plumb.
- H. Rough-in domestic water piping for water-meter installation according to utility company's requirements.
- I. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices in Section 22 05 48 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- J. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- K. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- L. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.

- M. Install piping to permit valve servicing.
- N. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.
- O. Install piping free of sags and bends.
- P. Install fittings for changes in direction and branch connections.
- Q. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
- R. Install pressure gages on suction and discharge piping for each plumbing pump and packaged booster pump. Comply with requirements for pressure gages in Section 22 05 19 "Meters and Gages for Plumbing Piping."
- S. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 22 05 17 "Sleeves and Sleeve Seals for Plumbing Piping."
- T. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 22 05 17 "Sleeves and Sleeve Seals for Plumbing Piping."
- U. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 22 05 18 "Escutcheons for Plumbing Piping."

3.03 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
- D. Joints for Dissimilar-Material Piping: Make joints using adapters compatible with materials of both piping systems.

3.04 TRANSITION FITTING INSTALLATION

- A. Install transition couplings at joints of dissimilar piping.
- B. Transition Fittings in Underground Domestic Water Piping:
 - 1. Fittings for NPS 1-1/2 and Smaller: Fitting-type coupling.
 - 2. Fittings for NPS 2 and Larger: Sleeve-type coupling.
- C. Transition Fittings in Aboveground Domestic Water Piping NPS 2 and Smaller: Plastic-to-metal transition fittings or unions.

3.05 DIELECTRIC FITTING INSTALLATION

- A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
- B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric couplings or nipples.

3.06 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for seismic-restraint devices in Section 22 05 48 "Vibration and Seismic Controls for Plumbing Piping and Equipment."

- B. Comply with requirements for pipe hanger, support products, and installation in Section 22 05 29 "Hangers and Supports for Plumbing Piping and Equipment."
 - 1. Vertical Piping: MSS Type 8 or 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
- E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
 - 2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
 - 3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
- F. Install supports for vertical copper tubing every 10 feet.

3.07 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.
- C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
 - 1. Water Heaters: Cold-water inlet and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
 - 2. Plumbing Fixtures: Cold- and hot-water-supply piping in sizes indicated, but not smaller than that required by plumbing code.
 - 3. Equipment: Cold- and hot-water-supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.08 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification materials and installation in Section 22 05 53 "Identification for Plumbing Piping and Equipment."
- B. Label pressure piping with system operating pressure.

3.09 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Piping Inspections:
 - a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
 - b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
 - 1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
 - 2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
 - c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
 - d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
 - 2. Piping Tests:
 - a. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
 - b. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
 - c. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 - d. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow it to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 - e. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
 - f. Prepare reports for tests and for corrective action required.
- B. Domestic water piping will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.10 ADJUSTING

- A. Perform the following adjustments before operation:
 - 1. Close drain valves, hydrants, and hose bibbs.
 - 2. Open shutoff valves to fully open position.
 - 3. Open throttling valves to proper setting.

4. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
 - a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
 - b. Adjust calibrated balancing valves to flows indicated.
5. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
6. Remove and clean strainer screens. Close drain valves and replace drain plugs.
7. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
8. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.11 CLEANING

- A. Clean and disinfect potable domestic water piping as follows:
 1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
 2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
 - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
 - d. Repeat procedures if biological examination shows contamination.
 - e. Submit water samples in sterile bottles to authorities having jurisdiction.
- B. Clean non-potable domestic water piping as follows:
 1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
 2. Use purging procedures prescribed by authorities having jurisdiction or; if methods are not prescribed, follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.
- C. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.
- D. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.12 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.
- D. Aboveground domestic water piping, NPS 4 and smaller, shall be the following:
 - 1. Hard copper tube, ASTM B 88, Type L; wrought-copper, solder-joint fittings; and soldered joints.

3.13 VALVE SCHEDULE

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 - 1. Shutoff Duty: Use ball or gate valves for piping NPS 2 and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 2-1/2 and larger.
 - 2. Drain Duty: Hose-end drain valves.
- B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

END OF SECTION

SECTION 22 11 19
DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following domestic water piping specialties:
 - 1. Backflow preventers.
 - 2. Balancing valves.
 - 3. Strainers.
 - 4. Hose bibbs.
 - 5. Wall hydrants.
 - 6. Drain valves.
 - 7. Water hammer arresters.
 - 8. Trap-seal primer valves.
- B. Related Sections include the following:
 - 1. Division 22 Section "Meters and Gages for Plumbing Piping" for thermometers, pressure gages, and flow meters in domestic water piping.

1.03 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Diagram power, signal, and control wiring.
- C. Field quality-control test reports.
- D. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

1.04 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. NSF Compliance:
 - 1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components.
 - 2. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."

PART 2 - PRODUCTS

2.01 VACUUM BREAKERS

- A. Hose-Connection Vacuum Breakers:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Woodford Manufacturing Company.
 - b. Zurn Plumbing Products Group; Wilkins Div.
 - c. Watts Industries, Inc.; Water Products Div.
 - d. MIFAB, Inc.
 - 2. Standard: ASSE 1011.
 - 3. Body: Bronze, nonremovable, with manual drain.
 - 4. Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.
 - 5. Finish: Chrome or nickel plated.

2.02 BACKFLOW PREVENTERS

- A. Reduced-Pressure-Principle Backflow Preventers:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. FEBCO; SPX Valves & Controls.
 - b. Watts Industries, Inc.; Water Products Div.
 - c. Zurn Plumbing Products Group; Wilkins Div.
 - 2. Standard: ASSE 1013.
 - 3. Operation: Continuous-pressure applications.
 - 4. Body: Bronze for and smaller; cast iron with interior lining complying with AWWA C550 or that is FDA approved for and larger.
 - 5. End Connections: Threaded.
 - 6. Configuration: Designed for horizontal, straight through flow.
 - 7. Accessories:
 - a. Valves: Ball type with threaded ends on inlet and outlet of and smaller; outside screw and yoke gate-type with flanged ends on inlet and outlet of and larger.
 - b. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.
- B. Hose-Connection Backflow Preventers:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Conbraco Industries, Inc.
 - b. Watts Industries, Inc.; Water Products Div.
 - c. Woodford Manufacturing Company.
 - 2. Standard: ASSE 1052.

3. Operation: Up to back pressure.
4. Inlet Size: 3/4".
5. Outlet Size: Garden-hose thread complying with ASME B1.20.7.
6. Capacity: At least flow.

2.03 BALANCING VALVES

- A. Copper-Alloy Calibrated Balancing Valves:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 3. Basis-of-Design Product: Subject to compliance with requirements, provide a product by one of the following:
 - a. Taco, Inc.
 - b. Watts Industries, Inc.; Water Products Div.
 - c. NIBCO INC.
 4. Type: Ball valve with two readout ports and memory setting indicator.
 5. Body: Bronze,
 6. Size: Same as connected piping, but not larger than.
 7. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

2.04 STRAINERS FOR DOMESTIC WATER PIPING

- A. Y-Pattern Strainers:
1. Pressure Rating: minimum, unless otherwise indicated.
 2. Body: Bronze for and smaller; cast iron with interior lining complying with AWWA C550 or FDA-approved, epoxy coating and for and larger.
 3. End Connections: Threaded and smaller; flanged for and larger.
 4. Screen: Stainless steel with round perforations, unless otherwise indicated.
 5. Drain: Factory-installed, hose-end drain valve.

2.05 HOSE BIBBS

- A. Hose Bibbs HB-1
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Josam Company
 - b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc,
 - c. Zurn Plumbing Products Group; Light Commercial Operation
 2. Standard: ASME A112.18.1 for sediment faucets.
 3. Body Material: Bronze.

4. Seat: Bronze, replaceable.
5. Supply Connections: NPS 3/4 (DN 20) threaded or solder-joint inlet.
6. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.
7. Pressure Rating: 125 psig (860 kPa).
8. Vacuum Breaker: Integral nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
9. Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.
10. Finish for Service Areas: Rough bronze.
11. Finish for Finished Rooms: Chrome or nickel plated.
12. Operation for Equipment Rooms: Wheel handle or operating key.
13. Operation for Service Areas: Operating key.
14. Operation for Finished Rooms: Operating key.
15. Include operating key with each operating-key hose bibb.
16. Include integral wall flange with each chrome- or nickel-plated hose bibb.

2.06 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-110 for standard-port, two-piece ball valves.
2. Pressure Rating: minimum CWP.
3. Body: Copper alloy.
4. Ball: Chrome-plated brass.
5. Seats and Seals: Replaceable.
6. Handle: Vinyl-covered steel.
7. Inlet: Threaded or solder joint.
8. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

2.07 WATER HAMMER ARRESTERS

A. Water Hammer Arresters WHA-1:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - b. PPP Inc.
 - c. MIFAB, Inc.
2. Standard: ASSE 1010 or PDI-WH 201.
3. Type: Copper tube with piston.
4. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

2.08 TRAP-SEAL PRIMER VALVES

- A. Supply-Type (Single), Trap-Seal Primer Valves TP-1:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. MIFAB, Inc.
 - b. PPP Inc.
 - c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - 2. Standard: ASSE 1018.
 - 3. Pressure Rating: minimum.
 - 4. Body: Bronze.
 - 5. Inlet and Outlet Connections: threaded, union, or solder joint.
 - 6. Gravity Drain Outlet Connection: threaded or solder joint.
 - 7. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.
- B. Trap-Type (Single), Trap-Seal Primer Valves PT-1:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. MIFAB, Inc.
 - b. PPP Inc.
 - c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - 2. Standard: ASSE 1018.
 - 3. Body: Bronze.
 - 4. Inlet and Outlet Connections: ground joint connection and escutcheons.
 - 5. Gravity Drain Outlet Connection: threaded or solder joint.
 - 6. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Refer to Division 23 Section "Basic Mechanical Materials and Methods" for piping joining materials, joint construction, and basic installation requirements.
- B. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.
 - 1. Locate backflow preventers in same room as connected equipment or system.
 - 2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe to floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are not acceptable for this application.

3. Do not install bypass piping around backflow preventers.
- C. Install balancing valves in locations where they can easily be adjusted.
- D. Install Y-pattern strainers for water on supply side of each solenoid valve, and pump.
- E. Install water hammer arresters in water piping according to PDI-WH 201.
- F. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.

3.02 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping and specialties.
- B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

3.03 LABELING AND IDENTIFYING

- A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
 1. Reduced-pressure-principle backflow preventers.
 2. Double-check backflow-prevention assemblies.
 3. Calibrated balancing valves.
 4. Supply-type, trap-seal primer valves.
- B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 23 Section "Mechanical Identification."

3.04 FIELD QUALITY CONTROL

- A. Perform the following tests and prepare test reports:
 1. Test each reduced-pressure-principle backflow preventer according to authorities having jurisdiction and the device's reference standard.
- B. Remove and replace malfunctioning domestic water piping specialties and retest as specified above.

3.05 ADJUSTING

- A. Set field-adjustable pressure set points of water pressure-reducing valves.
- B. Set field-adjustable flow set points of balancing valves.
- C. Set field-adjustable temperature set points of temperature-actuated water mixing valves.

END OF SECTION

SECTION 22 13 16
SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following for soil, waste, and vent piping inside the building:
 - 1. Pipe, tube, and fittings.
 - 2. Special pipe fittings.
 - 3. Encasement for underground metal piping.

1.03 DEFINITIONS

- A. PE: Polyethylene plastic.

1.04 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water.
- B. Seismic Performance: Soil, waste, and vent piping and support and installation shall be capable of withstanding the effects of seismic events determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures."

1.05 SUBMITTALS

- A. Product Data: For pipe, tube, fittings, and couplings.
- B. Shop Drawings:
 - 1. Design Calculations: Signed and sealed by a qualified professional engineer for selecting seismic restraints.
- C. Field quality-control inspection and test reports.

1.06 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; "NSF-drain" for plastic drain piping; "NSF-tubular" for plastic continuous waste piping; and "NSF-sewer" for plastic sewer piping.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

2.03 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. Shielded Couplings: ASTM C 1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.
 - 1. Heavy-Duty, Shielded, Stainless-Steel Couplings: With stainless-steel shield, 4 stainless-steel bands and tightening devices, and ASTM C 564, rubber sleeve.
 - a. Manufacturers:
 - 1) Husky.
 - 2) Clamp-All Corp.
 - 3) Mission Rubber Co.

2.04 PVC PIPE AND FITTINGS

- A. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping and "NSF-sewer" for plastic sewer piping.
- B. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.
- C. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.
- D. Adhesive Primer: ASTM F 656.
- E. Solvent Cement: ASTM D 2564.

PART 3 - EXECUTION

3.01 PIPING APPLICATIONS

- A. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.
- B. Aboveground, soil and waste piping NPS 4 and smaller shall be any of the following:
 - 1. Hubless cast-iron soil pipe and fittings; heavy-duty shielded couplings; and hubless-coupling joints.
- C. Aboveground, vent piping NPS 4 and smaller shall be any of the following:
 - 1. Hubless cast-iron soil pipe and fittings; heavy-duty shielded couplings; and hubless-coupling joints.

- D. Underground, soil, waste, and vent piping NPS 4 and smaller shall be any of the following:
 1. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.
- E. Aboveground, condensate drain piping shall be any of the following:
 1. Hard Copper Tube: ASTM B 88, Type L (ASTM B 88M, Type B), water tube, drawn temper.

3.02 PIPING INSTALLATION

- A. Basic piping installation requirements are specified in Division 23 Section "Basic Materials and Methods."
- B. Install seismic restraints on piping.
- C. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 1. Install encasement on underground piping according to ASTM A 674 or AWWA C105.
- D. Install underground PVC piping according to ASTM D 2321.
- E. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- F. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- G. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
 1. Building Sanitary Drain: 2 percent downward in direction of flow for all piping.
 2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- H. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.
- I. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

3.03 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 23 Section "Basic Mechanical Materials and Methods."
- B. Join hubless cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.

- C. Plastic, Nonpressure-Piping, Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. PVC Piping: Join according to ASTM D 2855 and ASTM D 2665 appendixes.

3.04 HANGER AND SUPPORT INSTALLATION

- A. Pipe hangers and supports are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:
 - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 2. Install individual, straight, horizontal piping runs according to the following:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet, if Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch minimum rods.
- E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
 - 2. NPS 3: 60 inches with 1/2-inch rod.
 - 3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
- F. Install supports for vertical cast-iron soil piping every 15 feet.
- G. Install hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 48 inches (1200 mm) with 3/8-inch (10-mm) rod.
 - 2. NPS 3 (DN 80): 48 inches (1200 mm) with 1/2-inch (13-mm) rod.
 - 3. NPS 4 and NPS 5 (DN 100 and DN 125): 48 inches (1200 mm) with 5/8-inch (16-mm) rod.
- H. Install supports for vertical [ABS] [and] [PVC] piping every 48 inches (1200 mm).
- I.
- J. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.05 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.

- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect drainage and vent piping to the following:
 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
 4. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.

3.06 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
 1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
 4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.

5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.07 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.
- D. Exposed PVC Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint.

3.08 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
- B. Aboveground, soil and waste piping NPS 4 (DN 100) and smaller shall be the following:
 1. Hubless, cast-iron soil pipe and fittings; heavy-duty hubless-piping couplings; and coupled joints.
- C. Aboveground, vent piping NPS 4 (DN 100) and smaller shall be any of the following:
 1. Hubless, cast-iron soil pipe and fittings; heavy-duty hubless-piping couplings; and coupled joints.
- D. Underground, soil, waste, and vent piping NPS 4 (DN 100) and smaller shall be the following:
 1. Solid wall PVC pipe, PVC socket fittings, and solvent-cemented joints.

END OF SECTION

SECTION 22 13 19
SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following plumbing specialties:
 - 1. Balancing valves.
 - 2. Water Filters.
 - 3. Cleanouts.
 - 4. Floor drains.
 - 5. Floor sinks.
 - 6. Drain Receptors.

1.03 PERFORMANCE REQUIREMENTS

- A. Provide components and installation capable of producing piping systems with following minimum working-pressure ratings, unless otherwise indicated:
 - 1. Domestic Water Piping: 125 psig.
 - 2. Sanitary Waste and Vent Piping: 10-foot head of water.

1.04 SUBMITTALS

- A. Product Data: Include rated capacities and shipping, installed, and operating weights. Indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections for the following:
 - 1. Balancing valves, water filters, and strainers.
 - 2. Thermostatic water mixing valves and water tempering valves.
 - 3. Water hammer arresters, air vents, and trap seal primer valves and systems.
 - 4. Drain valves, hose bibbs, hydrants, and hose stations.
 - 5. Sleeve penetration systems.
- B. Shop Drawings: Diagram power, signal, and control wiring.
- C. Field test reports.
- D. Maintenance Data: For plumbing specialties to include in maintenance manuals. Include the following:
 - 1. Water filters.
 - 2. Thermostatic water mixing valves and water tempering valves.
 - 3. Trap seal primer valves and systems.

1.05 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of plumbing specialties and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
- B. Plumbing specialties shall bear label, stamp, or other markings of specified testing agency.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for piping materials and installation.
- E. NSF Compliance:
 - 1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components. Include marking "NSF-pw" on plastic potable-water piping and "NSF-dwv" on plastic drain, waste, and vent piping.
 - 2. Comply with NSF 61, "Drinking Water System Components--Health Effects, Sections 1 through 9," for potable domestic water plumbing specialties.

1.06 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Water Filter Cartridges: Equal to 200 percent of amount installed for each type and size indicated.
 - 2. Operating Key Handles: Equal to 100 percent of amount installed for each key-operated hose bibb and hydrant installed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Products: Subject to compliance with requirements, provide one of the products specified.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.02 BALANCING VALVES

- A. Calibrated Balancing Valves: Adjustable, with two readout ports and memory setting indicator. Include manufacturer's standard hoses, fittings, valves, differential pressure meter, and carrying case.
 - 1. Manufacturers:
 - a. Amtrol, Inc.
 - b. Taco, Inc.
 - c. Watts Industries, Inc.; Water Products Div.

2. NPS 2 and Smaller: Bronze body with brass ball, adjustment knob, calibrated nameplate, and threaded or solder-joint ends.
3. NPS 2 and Smaller: Bronze, Y-pattern body with adjustment knob and threaded ends.
4. NPS 2-1/2 and Larger: Cast-iron, Y-pattern body with bronze disc and flanged or grooved ends.

2.03 WATER FILTERS

- A. Manufacturers:
 1. Filtrine Manufacturing Company; Drinking Water Division.
 2. Osmonics.
 3. PURA, Inc.
 4. U.S. Filter; Filterite Div.
 5. Watts Industries, Inc.; Water Products Div.
- B. General: Cartridge-type assemblies suitable for potable water. Include housing, fittings, filter cartridges, and cartridge end caps.

2.04 CLEANOUTS

- A. Cleanouts, WCO: Comply with ASME A112.36.2M or ASME A112.3.1.
 1. Application: Wall cleanout.
 2. Products:
 - a. Josam Co.
 - b. Smith, Jay R. Mfg. Co.
 - c. Zurn Industries, Inc., Specification Drainage Operation
 3. Body or Ferrule Material: Cast iron.
 4. Clamping Device: Required.
 5. Outlet Connection: Threaded.
 6. Closure: Brass plug with straight threads and gasket.
 7. Adjustable Housing Material: Cast iron with threads.
 8. Frame and Cover Material and Finish: Polished bronze.
 9. Frame and Cover Shape: Round.

2.05 FLOOR DRAINS

- A. Floor Drains, FD-1: Comply with ASME A112.21.1M.
 1. Application: Shower drain.
 2. Products:
 - a. Josam Co.; Model 30000-Z-A.
 - b. Smith, Jay R. Mfg. Co.; Fig. 2005-A.
 - c. Zurn Industries, Inc., Specification Drainage Operation; Model Z-415.
 3. Body Material: Gray iron.

4. Seepage Flange: Required.
5. Clamping Device: Required.
6. Outlet: Bottom.
7. Exposed Surfaces and Interior Lining: Not required.
8. Sediment Bucket: Not required.
9. Top or Strainer Material: Nickel bronze.
10. Top of Body and Strainer Finish: Chrome.
11. Top Shape: Round.
12. Dimensions of Top or Strainer: 5-inches diameter.
13. Top Loading Classification: Light Duty.
14. Trap Material: Cast iron.
15. Trap Pattern: Standard P-trap with trap primer connection.
16. Trap Features: Not required.
17. Provide min. 3-inch waste connection.

2.06 FLOOR SINKS

- A. Floor Sinks, FS-1: Comply with ASME A12.21.1M.
 1. Application: Floor Sink.
 2. Products:
 - a. Josam Co.
 - b. Smith, Jay R. Mfg. Co.; Fig 3100.
 - c. Zurn Industries, Inc., Specification Drainage Operation; Model No. Z-1910.
 3. Body Material: Gray iron.
 4. Seepage Flange: Required.
 5. Clamping Device: Required.
 6. Outlet: Bottom.
 7. Exposed Surfaces and Interior Lining: Acid-resistant enamel.
 8. Sediment Bucket: Not required.
 9. Top Material: Gray iron.
 10. Top Shape: Square.
 11. Dimensions of Top or Strainer: 8-1/2 inch square.
 12. Top Loading Classification: Medium Duty.
 13. Trap Material: Cast iron.
 14. Trap Pattern: Standard P-trap.
 15. Trap Features: Trap seal primer valve drain connection.
 16. Provide min. 3-inch waste connection.
- B. Drain Receptor, DR-1: Comply with ASME A112.21.2M.

1. Applications: Drain receptor.
2. Products:
 - a. Smith, Jay R. Mfg. Co.; Fig. 3970.
 - b. Or approved equal.
3. Body Material: Cast iron.
4. Dimensions of Body: 10 ½ inches diameter.
5. Combination Flashing Ring and Gravel Stop: Required.
6. Outlet: Bottom.
7. Solid Water Dam.
8. Extension Collars: Required.
9. Underdeck Clamp: Required.
10. Sump Receiver: Required.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Refer to Division 23 Section "Basic Mechanical Materials and Methods" for piping joining materials, joint construction, and basic installation requirements.
- B. Install expansion joints on vertical risers, stacks, and conductors if indicated.
- C. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
 1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
 2. Locate at each change in direction of piping greater than 45 degrees.
 3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
 4. Locate at base of each vertical soil and waste stack.
- D. Install cleanout deck plates with top flush with finished floor, for floor cleanouts for piping below floors.
- E. Install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall, for cleanouts located in concealed piping.
- F. Install flashing flange and clamping device with each stack and cleanout passing through floors with waterproof membrane.
- G. Install vent flashing sleeves on stacks passing through roof. Secure over stack flashing according to manufacturer's written instructions.
- H. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
 1. Position floor drains for easy access and maintenance.
 2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:

- a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
 - b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
 - c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.
- 3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
 - 4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- I. Fasten wall-hanging plumbing specialties securely to supports attached to building substrate if supports are specified and to building wall construction if no support is indicated.
 - J. Fasten recessed-type plumbing specialties to reinforcement built into walls.
 - K. Install wood-blocking reinforcement for wall-mounting and recessed-type plumbing specialties.
 - L. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.
 - M. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipefittings.

3.02 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment to allow service and maintenance.
- C. Connect plumbing specialties to piping specified in other Division 22 Sections.
- D. Ground equipment.
- E. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- F. Connect plumbing specialties and devices that require power according to Division 26 Sections.

3.03 LABELING AND IDENTIFYING

- A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each backflow preventer, thermostatic water mixing valve, and trap seal primer system.
 - 1. Text: Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit.
 - 2. Refer to Division 23 Section "Identification for HVAC Piping and Equipment" for nameplates and signs.

3.04 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled trap seal primer systems and their installation, including piping and electrical connections. Report results in writing.
 - 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.05 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

3.06 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain trap seal primer systems.

END OF SECTION

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SECTION 22 42 16.16
COMMERCIAL SINKS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Service basins.
 - 2. Service sinks.
 - 3. Sink faucets.
 - 4. Supply fittings.
 - 5. Waste fittings.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for sinks.
 - 2. Include rated capacities, operating characteristics, and furnished specialties and accessories.

1.04 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Counter cutout templates for mounting of counter-mounted lavatories.

1.05 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sinks to include in maintenance manuals.

1.06 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Faucet Washers and O-Rings: Equal to 10 percent of amount of each type and size installed.
 - 2. Faucet Cartridges and O-Rings: Equal to 5 percent of amount of each type and size installed.

1.07 DSA NOTES

- A. Plumbing fixtures and accessories provided in a toilet room or bathing room required to comply with CBC Section 11B-213.2 shall comply with CBC Section 11B-213-3.

- B. Effective March 1, 2017, all single-user toilet facilities shall be identified as Gender Neutral facilities by a door symbol that complies with CBC Sections 11B-216.8 and 11B-703.7.2.6.3. No pictogram, text, or braille is required on the symbol. If tactile jamb signage is provided, the signage shall comply with the appropriate technical requirements of CBC Section 11B-703. Examples of appropriate designations are "ALL-GENDER RESTROOM", "RESTROOM", or "UNISEX RESTROOM". DSA BU 17-01.
- C. Accessible plumbing fixtures shall comply with all the requirements in CBC Division 6.
- D. Clearance around accessible water closets and in toilet compartments shall be 60 inches minimum measured perpendicular from the side wall and 56 inches minimum measured perpendicular from the rear wall per CBC Section 11B-604.3.1.
- E. Heights and location of all fixtures shall be according to 2016 CBC Sections 11B-602 through 11B-612.
- F. Accessible fixture controls shall comply with CBC Sections 11B-602.3 for drinking fountains, 11B-604.6 for water closets, 11B-604.9.5 for childrens water closets, 11B-605.4 for urinals, 11B-606.4 for lavatories and sinks, 11B-607.5 for bathtubs, 11B-608.5 for showers, and 11B-611.3 for washing machines and clothes dryers.
- G. Accessible lavatories and sinks shall be mounted with the front of the nhigher of the rim or counter surface 34" maximum above the finish floor or ground. Depth of lavatories or sinks shall not interfere with knee and toe clearance provided in accordance with CBC Section 11B-306 when a forward approach is required. CBC Sections 11B-606.3 and 11B-606.7.
- H. Water supply and drain pipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks. CBC Section 11B-606.5.

PART 2 - PRODUCTS

2.01 SERVICE SINKS

- A. Service Sinks MS-1: Enameled, cast iron, trap standard mounted.
 - 1. American Standard
 - 2. Kohler
 - 3. Or Approved Equal.
 - 4. Fixture:
 - a. Standard: ASME A112.19.1/CSA B45.2.
 - b. Style: With front apron and raised back.
 - c. Nominal Size: 28 by 28 inches (710 by 710 mm).
 - d. Color: White.
 - e. Drain: Grid with NPS 3 (DN 80) outlet.
 - f. Rim Guard: Coated wire.
 - 5. Faucet: MS-1.

2.02 SINK FAUCETS

- A. NSF Standard: Comply with NSF/ANSI 61 Annex G, "Drinking Water System Components - Health Effects," for faucet-spout materials that will be in contact with potable water.
- B. Sink Faucets MS-1: Manual type, two-lever-handle mixing valve.
 - 1. Commercial, Solid-Brass Faucets.
 - a. Chicago Faucets
 - b. Speakman
 - c. Or Approved Equal.
 - 2. Standard: ASME A112.18.1/CSA B125.1.
 - 3. General: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and sink receptor.
 - 4. Body Type: Widespread.
 - 5. Body Material: Commercial, solid brass.
 - 6. Finish: Polished chrome plate.
 - 7. Maximum Flow Rate: 2.2 gpm (8.3 L/min.).
 - 8. Handle(s): Wrist blade, 4 inches (102 mm).
 - 9. Mounting Type: Back/wall, exposed.
 - 10. Spout Type: Rigid, solid brass with wall brace.
 - 11. Vacuum Breaker: Required for hose outlet.
 - 12. Spout Outlet: Hose thread according to ASME B1.20.7.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before sink installation.
- B. Examine walls, floors, and counters for suitable conditions where sinks will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install sinks level and plumb according to roughing-in drawings.
- B. Install supports, affixed to building substrate, for wall-hung sinks.
- C. Set floor-mounted sinks in leveling bed of cement grout.
- D. Install water-supply piping with stop on each supply to each sink faucet.
 - 1. Exception: Use ball or gate valves if supply stops are not specified with sink. Comply with valve requirements specified in Section 22 05 23.12 "Ball Valves for Plumbing Piping".
 - 2. Install stops in locations where they can be easily reached for operation.

- E. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 22 05 18 "Escutcheons for Plumbing Piping."
- F. Seal joints between sinks and counters, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 07 92 00 "Joint Sealants."

3.03 CONNECTIONS

- A. Connect sinks with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Section 22 11 16 "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Section 22 13 16 "Sanitary Waste and Vent Piping."

3.04 ADJUSTING

- A. Operate and adjust sinks and controls. Replace damaged and malfunctioning sinks, fittings, and controls.
- B. Adjust water pressure at faucets to produce proper flow.

3.05 CLEANING AND PROTECTION

- A. After completing installation of sinks, inspect and repair damaged finishes.
- B. Clean sinks, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
- C. Provide protective covering for installed sinks and fittings.
- D. Do not allow use of sinks for temporary facilities unless approved in writing by Owner.

END OF SECTION

SECTION 22 45 00
EMERGENCY PLUMBING FIXTURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Combination units.
 - 2. Supplemental equipment.
 - 3. Water-tempering equipment.

1.03 DEFINITIONS

- A. Accessible Fixture: Emergency plumbing fixture that can be approached, entered, and used by people with disabilities.
- B. Plumbed Emergency Plumbing Fixture: Fixture with fixed, potable-water supply.
- C. Tepid: Moderately warm.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include flow rates and capacities, furnished specialties, and accessories.

1.05 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Flushing-Fluid Solution: Separate lot and equal to at least 200 percent of amount of solution installed for each self-contained unit.

1.06 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ANSI Standard: Comply with ANSI Z358.1, "Emergency Eyewash and Shower Equipment."
- C. NSF Standard: Comply with NSF 61 Annex G, "Drinking Water System Components - Health Effects," for fixture materials that will be in contact with potable water.
- D. Regulatory Requirements: Comply with requirements in ICC/ANSI A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; for plumbing fixtures for people with disabilities.

PART 2 PRODUCTS

2.01 COMBINATION UNITS

- A. Accessible, Plumbed Emergency Shower with Eye/Face Wash Combination Units, ESH-1:
 - 1. Guardian GBF2170
 - 2. Or Approved Equal
 - 3. Piping:
 - a. Material: Chrome-plated brass or stainless steel.
 - b. Unit Supply: NPS 1-1/4 (DN 32) minimum.
 - c. Unit Drain: Outlet at back or side near bottom.
 - 4. Shower:
 - a. Capacity: Not less than 20 gpm (76 L/min.) for at least 15 minutes.
 - b. Supply Piping: NPS 1 (DN 25) with flow regulator and stay-open control valve.
 - c. Control-Valve Actuator: Pull rod.
 - d. Shower Head: 8-inch- (200-mm-) minimum diameter, chrome-plated brass or stainless steel.
 - e. Mounting: Pedestal.
 - 5. Eye/Face Wash Unit:
 - a. Capacity: Not less than 3 gpm (11.4 L/min.) for at least 15 minutes.
 - b. Supply Piping: NPS 1/2 (DN 15) with flow regulator and stay-open control valve.
 - c. Control-Valve Actuator: Pull Rod.
 - d. Spray-Head Assembly: Two or four receptor-mounted spray heads.
 - e. Receptor: Chrome-plated brass or stainless-steel bowl.
 - f. Mounting: Attached to shower pedestal.
 - g. Drench-Hose Option: May be provided instead of eye/face wash unit.
 - 1) Capacity: Not less than 3 gpm (11.4 L/min.) for at least 15 minutes.
 - 2) Drench Hose: Hand-held spray head with squeeze-handle actuator and hose.
 - 3) Mounting: Bracket on shower pedestal.

2.02 SUPPLEMENTAL EQUIPMENT

- A. Self-Contained, Personal Eyewash Units, PEEW-1:
 - 1. Haws
 - 2. Or Approved Equal.
 - 3. Capacity: Not less than 0.4 gpm (1.5 L/min.).
 - 4. Pressure Tank: 5 gal. (19 L), stainless steel, cylindrical, with pressure gage and base suitable for on-floor installation.
 - 5. Flushing Fluid: Medically acceptable solution manufactured and labeled according to applicable regulations.

6. Spray-Head Assembly: Chrome-plated copper alloy or stainless-steel piping with flow regulator; paddle-actuated, stay-open control valve; and two spray heads mounted on tank.

2.03 WATER-TEMPERING EQUIPMENT

- A. Hot- and Cold-Water, Water-Tempering Equipment, ESH-1:
 1. Guardian G3800LF
 2. Or Approved Equal.
 3. Description: Factory-fabricated equipment with thermostatic mixing valve.
 - a. Thermostatic Mixing Valve: Designed to provide 85 deg F (29 deg C) tepid, potable water at emergency plumbing fixtures, to maintain temperature at plus or minus 5 deg F (3 deg C) throughout required 15-minute test period, and in case of unit failure to continue cold-water flow, with union connections, controls, metal piping, and corrosion-resistant enclosure.
 - b. Supply Connections: For hot and cold water.

2.04 SOURCE QUALITY CONTROL

- A. Certify performance of emergency plumbing fixtures by independent testing organization acceptable to authorities having jurisdiction.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine roughing-in for water and waste piping systems to verify actual locations of piping connections before plumbed emergency plumbing fixture installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 EMERGENCY PLUMBING FIXTURE INSTALLATION

- A. Assemble emergency plumbing fixture piping, fittings, control valves, and other components.
- B. Install fixtures level and plumb.
- C. Fasten fixtures to substrate.
- D. Install shutoff valves in water-supply piping to fixtures. Use ball or gate valve if specific type valve is not indicated. Install valves chained or locked in open position if permitted. Install valves in locations where they can easily be reached for operation. Comply with requirements for valves specified in Section 22 05 23.12 "Ball Valves for Plumbing Piping".
 1. Exception: Omit shutoff valve on supply to group of plumbing fixtures that includes emergency equipment.
 2. Exception: Omit shutoff valve on supply to emergency equipment if prohibited by authorities having jurisdiction.
- E. Install dielectric fitting in supply piping to emergency equipment if piping and equipment connections are made of different metals. Comply with requirements for dielectric fittings specified in Section 22 11 16 "Domestic Water Piping."

- F. Install trap and waste piping on drain outlet of emergency equipment receptors that are indicated to be directly connected to drainage system. Comply with requirements for waste piping specified in Section 22 13 16 "Sanitary Waste and Vent Piping."
- G. Install escutcheons on piping wall and ceiling penetrations in exposed, finished locations. Comply with requirements for escutcheons specified in Section 22 05 18 "Escutcheons for Plumbing Piping."
- H. Fill self-contained fixtures with flushing fluid.

3.03 CONNECTIONS

- A. Connect hot- and cold-water-supply piping to hot- and cold-water, water-tempering equipment. Connect output from water-tempering equipment to emergency plumbing fixtures. Comply with requirements for hot- and cold-water piping specified in Section 22 11 16 "Domestic Water Piping."
- B. Directly connect emergency plumbing fixture receptors with trapped drain outlet to sanitary waste and vent piping. Comply with requirements for waste piping specified in Section 22 13 16 "Sanitary Waste and Vent Piping."
- C. Where installing piping adjacent to emergency plumbing fixtures, allow space for service and maintenance of fixtures.

3.04 IDENTIFICATION

- A. Install equipment nameplates or equipment markers on emergency plumbing fixtures and equipment and equipment signs on water-tempering equipment. Comply with requirements for identification materials specified in Section 22 05 53 "Identification for Plumbing Piping and Equipment."

3.05 FIELD QUALITY CONTROL

- A. Mechanical-Component Testing: After plumbing connections have been made, test for compliance with requirements. Verify ability to achieve indicated capacities.
- B. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection.
 - 2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Emergency plumbing fixtures and water-tempering equipment will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

3.06 ADJUSTING

- A. Adjust or replace fixture flow regulators for proper flow.

B. Adjust equipment temperature settings.

END OF SECTION

SECTION 226600 - CHEMICAL-WASTE SYSTEMS FOR LABORATORY FACILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Single-wall piping.
 - 2. Piping specialties.
 - 3. Dilution Traps.

1.3 DEFINITIONS

- A. CR: Chlorosulfonated polyethylene synthetic rubber.
- B. FPM: Vinylidene fluoride-hexafluoro propylene copolymer rubber.

1.4 PERFORMANCE REQUIREMENTS

- A. Single-Wall Piping Pressure Rating: 10 feet head of water.
- B. Delegated Design: Design seismic restraints for aboveground piping, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For neutralization system. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail neutralization-system assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

- C. Delegated-Design Submittal: For seismic restraints of aboveground piping, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

- A. Profile Drawings for Outdoor Underground Piping: Show system piping in elevation. Draw profiles at horizontal scale of not less than 1 inch equals 50 feet and vertical scale of not less than 1 inch equals 5 feet. Indicate underground structures and pipes. Show types, sizes, materials, and elevations of other utilities crossing system piping.
- B. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from sewerage system piping. Indicate interface and spatial relationship between piping and proximate structures.
- C. Field quality-control test reports.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For chemical-waste specialties and neutralization tanks, neutralization systems to include in emergency, operation, and maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NFPA Compliance: Comply with NFPA 70, "National Electrical Code."

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store piping and specialties with sealing plugs in ends or with end protection.
- B. Do not store plastic pipe or fittings in direct sunlight.
- C. Protect pipe, fittings, and seals from dirt and damage.

1.10 PROJECT CONDITIONS

- A. Interruption of Existing Chemical-Waste Service: Do not interrupt chemical-waste service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary chemical-waste service according to requirements indicated:

1. Notify Architect no fewer than two days in advance of proposed interruption of chemical-waste service.
2. Do not proceed with interruption of chemical-waste service without Architect's Owner's written permission.

1.11 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Section 03 30 00 "Cast-in-Place Concrete."

PART 2 - PRODUCTS

2.1 SINGLE-WALL PIPE AND FITTINGS

- A. PP Drainage Pipe and Fittings: ASTM F 1412, pipe extruded and drainage-pattern fittings molded, with Schedule 40 dimensions, from PP resin with fire-retardant additive complying with ASTM D 4101; with fusion-joint ends.
 1. Exception: Pipe and fittings made from PP resin without fire-retardant additive may be used for underground installation.
 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. IPEX Inc.
 - b. Orion Fittings, Inc.; a division of Watts Water Technologies, Inc.
 - c. Sloane, George Fischer Inc.
 - d. Town & Country Plastics, Inc.

2.2 JOINING MATERIALS

- A. Couplings: Assemblies with combination of clamps, gaskets, sleeves, and threaded or flanged parts; compatible with piping and system liquid; and made by piping manufacturer for joining system piping.
- B. Adapters and Transition Fittings: Assemblies with combination of clamps, couplings, adapters, gaskets, and threaded or flanged parts; compatible with piping and system liquid; and made for joining different piping materials.
- C. Flanges: Assemblies of companion flanges and gaskets complying with ASME B16.21 and compatible with system liquid, and bolts and nuts.

2.3 PIPING SPECIALTIES

A. Plastic Dilution Traps NT-1:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. IPEX Inc.
 - b. Orion Fittings, Inc.; a division of Watts Water Technologies, Inc.
 - c. Sloane, George Fischer Inc.
 - d. Town & Country Plastics, Inc.
2. Material: Corrosion-resistant PP, with removable base.
3. End Connections: Mechanical joint.
4. Dilution Tanks: 1-gal. capacity, with clear base unless colored base is indicated; with two NPS 1-1/2 top inlets and one NPS 1-1/2 side outlet.
5. Small Dilution Jars: 1-pint capacity, with clear base unless colored base is indicated; with NPS 1-1/2 top inlet and NPS 1-1/2 side outlet.
6. Large Dilution Jars: 1-quart capacity; with NPS 1-1/2 top inlet and NPS 1-1/2 side outlet.

B. PP Sink Outlets:

1. Description: NPS 1-1/2, with clamping device, stopper, and 7-inch- high overflow fitting.

2.4 LABORATORY SINKS

- ### **A. Laboratory Sink: Accessible, Single bowl, below-counter mounted, epoxy resin.**

2.5 Laboratory Faucet:

- a. Rigid 6-inch gooseneck faucet with serrated hose tip, Asahi "Omni" ball valve with 150 psig w.p. rating at 30-120 deg. F, deck mounted tailpiece with ½-inch threaded shank and lock nut. Unit shall be pre-assembled at factory with all threaded fittings completely sealed and seated. All components shall be of PVC construction. Chicago 828-SAM, Ryan Herco,. Faucet should be place on left side of industrial water.
- b. Flow Controls for Laboratory Faucets: Provide 1.5 gpm integral flow controls in aerators or base of faucet spouts.
- c. Faucet spout outlet fittings; provide interchangeable fittings for each sink: A non-aerator, laminar flow type; pressure compensating; low noise; non-splash; chrome plated brass; 1.5 gpm for sinks; Chicago E29; Chronomite "Omni" Series 200, Eco-Flow or equal.
- d. Serrated hose tip; 0.75 gpm flow control; chrome plated brass; Chicago E7-FC.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Chemical-Waste Piping Inside the Building:
1. Install piping next to equipment, accessories, and specialties to allow service and maintenance.
 2. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used unless otherwise indicated.
 3. Flanges may be used on aboveground piping unless otherwise indicated.
 4. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
 5. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
 6. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
 7. Install piping at indicated slopes.
 8. Install piping free of sags and bends.
 9. Install fittings for changes in direction and branch connections.
 10. Verify final equipment locations for roughing-in.

3.2 JOINT CONSTRUCTION

- A. Chemical-Waste Piping Inside the Building:
1. Plastic-Piping Electrofusion Joints: Make polyolefin drainage-piping joints according to ASTM F 1290.
 2. Dissimilar-Material Piping Joints: Make joints using adapters compatible with both system materials.

3.3 HANGER AND SUPPORT INSTALLATION

- A. Pipe sizes in this article refer to aboveground, single-wall piping.
- B. Comply with requirements in Section 22 05 29 "Hangers and Supports for Plumbing Piping and Equipment" for installation of supports.
- C. Support horizontal piping and tubing within 12 inches of each fitting and coupling.
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced 1 size for double-rod hangers, to minimum of 3/8 inch.

3.4 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Make connections to existing piping so finished Work complies as nearly as practical with requirements specified for new Work.
- C. Use commercially manufactured wye fittings for sewerage piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
- D. Protect existing piping to prevent concrete or debris from entering while making connections. Remove debris or other extraneous material that may accumulate.
- E. Install piping adjacent to equipment to allow service and maintenance.

3.5 LABELING AND IDENTIFICATION

- A. Comply with requirements in Section 22 05 53 "Identification for Plumbing Piping and Equipment" for labeling of equipment and piping.
 - 1. Use detectable warning tape over ferrous piping.
 - 2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.6 FIELD QUALITY CONTROL

- A. Inspect interior of sewerage piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place and again at completion of Project.
 - 1. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between inspection points.
 - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
 - c. Crushed, broken, cracked, or otherwise damaged piping.
 - d. Hydrostatic Tests for Drainage Piping:
 - 1) No allowable leakage is allowed during 24-hour period.
 - 2) Close openings in system and fill with water.
 - 3) Purge air and refill with water.
 - 4) Disconnect water supply.
 - 5) Test and inspect joints for leaks.

- e. Air Tests for Drainage Piping: Comply with UNI-B-6.
 - 2. Leaks and loss in test pressure constitute defects that must be repaired.
 - 3. Submit separate reports for each test.
- B. Replace leaking sewerage piping using new materials, and repeat testing until leakage is within allowances specified.
- C. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- D. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- E. Chemical-waste piping will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

3.7 CLEANING

- A. Use procedures prescribed by authorities having jurisdiction or, if not prescribed, use procedures described below:
 - 1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
 - 2. Clean piping by flushing with potable water.

3.8 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below unless otherwise indicated.
- B. Single-Wall, Chemical-Waste Sewerage Piping: Use the following piping materials for each size range:
 - 1. NPS 1-1/2 to NPS 4: PP drainage pipe and fittings and electrofusion joints.
- C. Aboveground Chemical-Waste Piping: Use the following piping materials for each size range:
 - 1. NPS 1-1/2 to NPS 6: PP drainage piping and electrofusion joints.

END OF SECTION 226600

SECTION 23 31 13
DUCT CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Duct cleaning of existing supply, return and exhaust ductwork.

B. Related Sections:

- 1. Section 23 33 00 "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

PART 2 - PRODUCTS

- 2.1 Not applicable.

PART 3 - EXECUTION

3.1 DUCT CLEANING TESTS

- A. Clean existing duct system(s) before testing.

- B. Use service openings for entry and inspection.

- 1. Create new openings and install access panels appropriate for duct static-pressure class if required for cleaning access. Provide insulated panels for insulated or lined duct. Patch insulation and liner as recommended by duct liner manufacturer. Comply with Section 23 33 00 "Air Duct Accessories" for access panels and doors.
- 2. Disconnect and reconnect flexible ducts as needed for cleaning and inspection.
- 3. Remove and reinstall ceiling to gain access during the cleaning process.

- C. Particulate Collection and Odor Control:

- 1. When venting vacuuming system inside the building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron-size (or larger) particles.

2. When venting vacuuming system to outdoors, use filter to collect debris removed from HVAC system, and locate exhaust downwind and away from air intakes and other points of entry into building.

D. Clean the following components by removing surface contaminants and deposits:

1. Air outlets and inlets (registers, grilles, and diffusers) shall be replaced with new registers.
2. Supply, return, and exhaust ductwork, dampers, actuators, and turning vanes.
3. Dedicated exhaust and ventilation components and makeup air systems.

E. Mechanical Cleaning Methodology:

1. Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.
2. Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of duct sections so areas being cleaned are under negative pressure.
3. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts, duct liner, or duct accessories.
4. Clean fibrous-glass duct liner with HEPA vacuuming equipment; do not permit duct liner to get wet. Replace fibrous-glass duct liner that is damaged, deteriorated, or delaminated or that has friable material, mold, or fungus growth.
5. Provide drainage and cleanup for wash-down procedures.
6. Antimicrobial Agents and Coatings: Apply EPA-registered antimicrobial agents if fungus is present. Apply antimicrobial agents according to manufacturer's written instructions after removal of surface deposits and debris.

3.2 DUCT SEALING

- A. Re-seal all ductwork as required due to duct cleaning or where ductwork has come unsealed due to the age of the ductwork system.
- B. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

3.3 START UP

- A. Air Balance is not required. The equipment will be re-started to serve the facility.

END OF SECTION 23 31 13

SECTION 23 37 13
DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes ceiling- and wall-mounted diffusers, registers, and grilles.
- B. Refer the contract design drawings for the scope of work.
- C. Related Sections include the following:
 - 1. Division 23 Section "Duct cleaning".

1.3 DEFINITIONS

- A. Diffuser: Circular, square, or rectangular air distribution outlet, generally located in the ceiling and comprised of deflecting members discharging supply air in various directions and planes and arranged to promote mixing of primary air with secondary room air.
- B. Grille: A louvered or perforated covering for an opening in an air passage, which can be located in a sidewall or ceiling.
- C. Register: A combination grille and damper assembly over an air opening.

1.4 SUBMITTALS

- A. Product Data: For each model indicated, include the following:
 - 1. Data Sheet: For each type of air outlet and inlet, and accessory furnished; indicate construction, finish, and mounting details.
 - 2. Performance Data: Include throw and drop, static-pressure drop, and noise ratings for each type of air outlet and inlet.
 - 3. Schedule of diffusers, registers, and grilles indicating drawing designation, room location, quantity, model number, size, and accessories furnished.
 - 4. Assembly Drawing: For each type of air outlet and inlet; indicate materials and methods of assembly of components.
- B. Coordination Drawings: Reflected ceiling plans and wall elevations drawn to scale to show locations and coordination of diffusers, registers, and grilles with other items installed in ceilings and walls.

1.5 QUALITY ASSURANCE

- A. Product Options: Drawings and schedules indicate specific requirements of diffusers, registers, and grilles and are based on the specific requirements of the systems indicated. Other manufacturers' products with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."
- B. NFPA Compliance: Install diffusers, registers, and grilles according to NFPA 90A, "Standard for the Installation of Air-Conditioning and Ventilating Systems."

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

- A. Diffusers, registers, and grilles are scheduled at the end of this Section.

2.2 SOURCE QUALITY CONTROL

- A. Testing: Test performance according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb, according to manufacturer's written instructions, Coordination Drawings, original design, and referenced standards.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practicable. For units installed in lay-in ceiling panels, locate units in the center of the panel. Where architectural features or other items conflict with installation, notify Engineer for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connection to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

3.4 CLEANING

- A. After installation of diffusers, registers, and grilles, inspect exposed finish. Clean exposed surfaces to remove burrs, dirt, and smudges. Replace diffusers, registers, and grilles that have damaged finishes.

3.5 DIFFUSER, REGISTER AND GRILLE SCHEDULE

A. Lay in Ceiling Diffuser:

- 1. Products: Subject to compliance with requirements, modular removable core, 4 core, provide one of the following:
 - a. Kruger.
 - b. Anemostat Products; Dynamics Corp. of America.
 - c. Titus.
- 2. Material: Steel.
- 3. Finish: Baked enamel, white.
- 4. Duct Connection: Round. or Square.
- 5. Duct Connection Size: As shown on drawings.
- 6. Face Size: 24" x 24."
- 7. Maximum Noise-Criterion Rating: NC20.
- 8. Face Style: Square. Perforated.
- 9. Mounting: Lay in.
- 10. Pattern: Adjustable.
- 11. Dampers: Opposed blade.

B. Hard Ceiling or Duct Mount Diffusers: Is the same as lay in ceiling diffusers except:

- 1. Face Size: Frame size required for duct connection size.
- 2. Face Style: Square.
- 3. Mounting: Surface mount.
- 4. Accessories: Provide faces style to match mounting style.

- C. Lay in ceiling return or exhaust register is same as lay in ceiling diffuser except without adjustable pattern and removable core.

END OF SECTION 23 37 13

SECTION 26 01 00
ELECTRICAL GENERAL PROVISIONS

ARTICLE 1 SUMMARY

- 1.1 This Division of the specification outlines the provisions of the contract work to be performed under this Division.
- 1.2 This Section applies to and forms a part of each section of specifications in Division 26 and all work performed under Division 26, 27 and 28.
- 1.3 In addition, work in this Division is governed by the provisions of the bidding requirements, contract forms, general conditions and all sections under general requirements.
- 1.4 These specifications contain statements which may be more definitive or more restrictive than those contained in the General Conditions. Where these statements occur, they shall take precedence over the General Conditions.
- 1.5 Where the words 'provide' or 'provision' are used, it shall be definitely interpreted as 'furnishing and installing complete in operating condition'. Where the words 'as indicated' or 'as shown' are used, it shall mean as shown on contract drawings.
- 1.6 Where items are specified in the singular, this Division shall provide the quantity as shown on drawings plus any spares or extras mentioned on drawings or specifications. All specified and supplied equipment shall be new.

ARTICLE 2 CONTRACTOR QUALIFICATIONS

- 2.1 The Contractor shall have a current California C-10 Electrical Contractor's license and all individuals working on this project shall have passed the Department of Industrial Relations Division of apprenticeship Standards – "Electrician Certification Program."

ARTICLE 3 CODES, PERMITS AND FEES

- 3.1 Comply with all applicable laws, ordinances, rules, regulations, codes, or rulings of governmental units having jurisdiction as well as standards of NFPA and serving utility requirements.
- 3.2 Obtain permits, fees, inspections, meter and the like, associated with work in each section of this Division.
- 3.3 Installation procedures, methods and conditions shall comply with the latest requirements of the Federal Occupational Safety and Health Act (OSHA).

ARTICLE 4 EXAMINATION OF PREMISES

- 4.1 Examine the construction drawings and premises prior to bidding. No allowances will be made for not being knowledgeable of existing conditions.

ARTICLE 5 STANDARDS

- 5.1 The following standard publications of the latest editions enforced, and supplements thereto shall form a part of these specifications. All electrical work must, as a minimum, be in accordance with these standards.
- 5.1.1 2019 California Electrical Code (CEC), Part 3 Title 24 CCR.
 - 5.1.2 National Fire Protection Association.
 - 5.1.3 Underwriters' Laboratories, Inc. (UL).
 - 5.1.4 Certified Ballast Manufacturers' Association (CBM).
 - 5.1.5 National Electrical Manufacturers' Association (NEMA).
 - 5.1.6 Institution of Electrical & Electronics Engineers (IEEE).
 - 5.1.7 American Society for Testing & Materials (ASTM).
 - 5.1.8 National Board of Fire Underwriters (NBFU).
 - 5.1.9 National Board of Standards (NBS).
 - 5.1.10 American National Standards Institute (ANSI).
 - 5.1.11 Insulated Power Cable Engineers Association (IPECS).
 - 5.1.12 Electrical Testing Laboratories (ETL).
 - 5.1.13 National Electrical Safety Code (NESC).
 - 5.1.14 2019 California Building Code (CBC), Part 2, Title 24 CCR.
 - 5.1.15 2019 California Fire Code (CFC), Part 9, Title 24, CCR.
 - 5.1.16 2016 NFPA 72 with California State Amendments
 - 5.1.17 National Electrical Testing Association (NETA), 2010 or most current

ARTICLE 6 DEFINITIONS

- 6.1 Concealed: Hidden from sight, as in trenches, chases, hollow construction, or above furred spaces, hung ceilings - acoustical or plastic type, or exposed to view only in tunnels, attics, shafts, crawl spaces, unfinished spaces, or other areas solely for maintenance and repair.
- 6.2 Exposed, Non-Concealed, Unfinished Space: A room or space that is ordinarily accessible only to building maintenance personnel, a room noted on the 'finish schedule' with exposed and unpainted construction for walls, floors, or ceilings or specifically mentioned as 'unfinished'.
- 6.3 Finish Space: Any space ordinarily visible, including exterior areas.

ARTICLE 7 WORK AND MATERIALS

- 7.1 Unless otherwise specified, all materials must be new and of the best quality. Materials previously incorporated into other projects, salvaged, or refurbished are not considered new. Perform all labor in a thorough and workmanlike manner.

- 7.2 All materials provided under the contract must bear the UL label where normally available. Note that this requirement may be repeated under equipment specifications. In general, such devices as will void the label should be provided in separate enclosures and wired to the labeled unit in proper manner.

ARTICLE 8 SHOP DRAWINGS AND SUBMITTALS

- 8.1 Submit shop drawings and all data in accordance with Division 1 of these specifications and as noted below for all equipment provided under this Division.
- 8.2 Shop drawings submittals demonstrate to the Architect that the Contractor understands the design concept. The Contractor demonstrates their understanding by indicating which equipment and material they intend to furnish and install and by detailing the fabrication and installation methods of material and equipment he intends to use. If deviations, discrepancies, or conflicts between submittals and specifications are discovered either prior to or after submittals are processed, notify the Architect immediately.
- 8.3 Manufacturer's data and dimension sheets shall be submitted giving all pertinent physical and engineering data including weights, cross sections and maintenance instructions. Standard items of equipment such as receptacles, switches, plates, etc., which are cataloged items, shall be listed by manufacturer.
- 8.4 Index all submittals and reference them to these specifications. All submittal items shall be assembled and submitted, one for each specification section. (Multiple specification sections may be grouped together in one common submittal binder, as long as each individual section is clearly identified.) Partial or incomplete submittal sections will not be reviewed.

ARTICLE 9 EQUIPMENT PURCHASES

- 9.1 Arrange for purchase and delivery of all materials and equipment within 20 days after approval of submittals. All materials and equipment must be ordered in ample quantities for delivery at the proper time. If items are not on the project in time to expedite completion, the Owner may purchase said equipment and materials and deduct the cost from the contract sum.
- 9.2 Provide all materials of similar class or service by one manufacturer.

ARTICLE 10 COOPERATIVE WORK

- 10.1 Correct without charge any work requiring alteration due to lack of proper supervision or failure to make proper provision in time. Correct without charge any damage to adjacent work caused by the alteration.

- 10.2 Cooperative work includes: General supervision and responsibility for proper location and size of work related to this Division, but provided under the other sections of these specifications, and installation of sleeves, inserts, and anchor bolts for work under each section in this Division.

ARTICLE 11 VERIFICATION OF DIMENSIONS

- 11.1 Scaled and figured dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions, etc., and be responsible for properly fitting equipment and materials together and to the structure in spaces provided.
- 11.2 Drawings are essentially diagrammatic, and many offsets, bends, pull boxes, special fittings, and exact locations are not indicated. Carefully study drawings and premises in order to determine best methods, exact location, routes, building obstructions, etc. and install apparatus and equipment in manner and locations to avoid obstructions, preserve headroom, keep openings and passageways clear, and maintain proper clearances.

ARTICLE 12 CLOSING-IN OF UNINSPECTED WORK

- 12.1 Cover no work until inspected, tested, and approved by the Architect. Where work is covered before inspection and test, uncover it and when inspected, tested, and approved, restore all work to original proper condition at no additional cost to Owner.

ARTICLE 13 EXCAVATION AND BACKFILL

- 13.1 All excavation and backfill shall be in accordance with Division 1 of these specifications and as noted below.
- 13.2 Perform all necessary excavation, shoring, and backfilling required for the proper laying of all conduits inside the building and premises, and outside as may be necessary.
- 13.3 Excavate all trenches open cut, keep trench banks as nearly vertical as practicable, and sheet and brace trenches where required for stability and safety. Excavate trenches true to line and make bottoms no wider than necessary to provide ample work room. Grade trench bottoms accurately. Machine grade only to the top line of the conduits, doing the remainder by hand. Do not cut any trench near or under footings without first consulting the Architect. All trenches shall be done in accordance with OSHA standards and regulations.
- 13.4 Backfilling shall be done with each layer compacted before another layer is added. No stones or coarse lumps shall be laid directly on a conduit or conduits.
- 13.5 Trenches shall be filled with the specified material. Sod, if any, shall be removed in cut sections and replaced in same manners.

- 13.6 Provide pumps and drainage of all open trenches for purposes of installing electrical duct and wiring.
- 13.7 Perform all backfilling in accordance with the requirements of and under the direction of the Geotechnical Engineer.
- 13.8 Where new underground trenching is required on sites or in any area where existing underground utilities exist, the Contractor shall provide an independent professional utility locating service to locate exact vertical and horizontal locations of all existing utilities. Where existing utilities are found the Contractor shall hand dig those areas to avoid disruption. The Contractor shall be responsible for immediate repairs to existing underground utilities damaged during construction. The Contractor shall repair all existing asphalt, concrete and landscape surfaces damaged or removed during construction to match their original conditions. Where trenching extends through public streets or roadways, the Contractor shall notify underground service alert in addition to the independent locating service 48 hours before start of construction to determine location of existing utilities by calling (800) 422-4133.

ARTICLE 14 CONCRETE

- 14.1 Where used for structures to be provided under the contract such as bases, etc., concrete work, and associated reinforcing shall be as specified under Division 3 of these specifications.
- 14.2 See other sections for additional requirements for underground vaults, cable ducts, etc.

ARTICLE 15 ACCESSIBILITY

- 15.1 Install all control devices or other specialties requiring reading, adjustment, inspection, repairs, removal, or replacement conveniently and accessibly throughout the finished building.
- 15.2 All required access doors or panels in walls and ceilings are to be furnished and installed as part of the work under this Section. Refer to Division 1 of these specifications and as noted below.
- 15.3 Where located in fire rated assemblies, provide doors which match the rating of the assembly and are approved by the jurisdictional authority.
- 15.4 Refer to 'finish schedule' for types of walls and ceilings in each area and the architectural drawings for rated wall construction.
- 15.5 Coordinate work of the various sections to locate specialties requiring accessibility with others to avoid unnecessary duplication of access doors.

ARTICLE 16 FLASHING

- 16.1 Flash and counter flash all conduits penetrating roofing membrane as shown on Architectural drawings. All work shall be in accordance with Division 7 of these specifications.

ARTICLE 17 IDENTIFICATION OF EQUIPMENT

- 17.1 All electrical equipment shall be labeled, tagged, stamped, or otherwise identified in accordance with the following schedules:

17.1.1 General:

17.1.1.1 In general, the installed laminated nameplates as hereinafter called for shall also clearly indicate its use, areas served, circuit identification, voltage and any other useful data.

17.1.1.2 All auxiliary systems, including communications, shall be labeled to indicate function.

17.1.2 Lighting and Local Panelboards:

17.1.2.1 Panel identification shall be with white and black micarta nameplates. Letters shall be no less than 3/8" high.

17.1.2.2 Circuit directory shall be two column typewritten card set under glass or glass equivalent. Each circuit shall be identified by the room number and/or number of unit and other pertinent data as required.

17.1.3 Distribution Switchboards and Feeders Sections:

17.1.3.1 Identification shall be with 1" x 4" laminated white micarta nameplates with black lettering on each major component, each with name and/or number of unit and other pertinent data as required. Letters shall be no less than 3/8" high.

17.1.3.2 Circuit breakers and switches shall be identified by number and name with 3/8" x 1-1/2" laminated micarta nameplates with 3/16" high letters mounted adjacent to or on circuit breaker or switch.

17.1.4 Disconnect Switches, Motor Starters and Transformers:

17.1.4.1 Identification shall be with white micarta laminated labels and 3/8" high black lettering.

17.1.5 All communication system terminal boxes including T.V., telephone/intercom, security, fire alarm, clock, and computer networking shall be provided with white micarta laminated labels and 3/8" high black lettering.

ARTICLE 18 CONSTRUCTION FACILITIES

- 18.1 Furnish and maintain from the beginning to the completion all lawful and necessary guards, railings, fences, canopies, lights, warning signs, etc. Take all necessary precautions required by City, State Laws, and OSHA to avoid injury or damage to any persons and property.
- 18.2 Temporary power and lighting for construction purposes shall be provided under this Section. All work shall be in accordance with Division 1 of these specifications.

ARTICLE 19 GUARANTEE

- 19.1 Guarantee all material, equipment and workmanship for all sections under this Division in writing to be free from defect of material and workmanship for one year from date of final acceptance, as outlined in the general conditions. Replace without charge any material or equipment proven defective during this period. The guarantee shall include performance of equipment under all site conditions, conditions of load, installing any additional items of control and/or protective devices, as required.

ARTICLE 20 PATENTS

- 20.1 Refer to the General Conditions for Contractor's responsibilities regarding patents.

ARTICLE 21 PLUMBING (DIVISION 22) / HEATING, VENTILATING, AND AIR CONDITIONING (DIVISION 23) / ELECTRICAL – COORDINATION REQUIREMENTS

- 21.1 All electrical work performed for this project shall conform to the California Electrical Code, to Local Building Codes and in conformance with Division 22, 23, and 26 of these specifications, whether the work is provided under the “Plumbing”, “Heating, Ventilating, and Air Conditioning”, or the “Electrical” Division of these specifications. Where the Division 22 and/or Division 23 Contractor is required to provide electrical work, he shall arrange for the work to be done by a licensed Division 26 Contractor, using qualified electricians. The Division 22 and/or Division 23 Contractor shall be solely and completely responsible for the correct functioning of all equipment regardless of who provided the electrical work.
- 21.2 The work under Division 22 and/or Division 23 shall include the following:
 - 21.2.1 All motors required by mechanical equipment.
 - 21.2.2 All starters for mechanical equipment which are not provided under the electrical division as part of a motor control center or otherwise indicated on the electrical drawings.
 - 21.2.3 All wiring interior to packaged equipment furnished as an integral part of the equipment.

- 21.2.4 All control **wiring and conduit** for mechanical control systems.
- 21.2.5 All control systems required by mechanical equipment.
- 21.3 The work under Division 26 shall include the following:
 - 21.3.1 All power wiring and conduit; and conduit only for EMS control conductors between each building and the main control panel.
 - 21.3.2 Electrical disconnects as shown on the electrical drawings.
 - 21.3.3 Starters forming part of a motor control center.
- 21.4 All power wiring and conduit to equipment furnished under Division 22 and/or Division 23 shall be provided under Division 26. Control wiring and conduit, whether line voltage or low voltage, shall be provided under the division which furnishes the equipment.
- 21.5 Power wiring shall be defined as all wiring between the panelboard switchboard overcurrent device, motor control center starter or switch, and the safety disconnect switch or control panel serving the equipment. Also, the power wiring between safety disconnect switch and the equipment line terminals.
- 21.6 Control wiring shall be defined as all wiring, either line voltage or low voltage, required for the control and interlocking of equipment, including but not limited to wiring to motor control stations, solenoid valves, pressure switches, limit switches, flow switches, thermostats, humidistats, safety devices, smoke detectors, and other components required for the proper operation of the equipment.
- 21.7 All motor starters which are not part of motor control centers and which are required for equipment furnished under this Division shall be furnished and installed by the Division furnishing the equipment and power wiring connected under Division 26. Motor starters and control devices in motor control centers shall be furnished and installed under Division 26.
- 21.8 Division 26 Contractor shall make all final connections of power wiring to equipment furnished under this Division.
- 21.9 Wiring diagrams complete with all connection details shall be furnished under each respective Section.
- 21.10 Motor starters supplied by Plumbing and/or Heating, Ventilating and Air Conditioning shall be fused combination type minimum NEMA Size 1, and conform to appropriate NEMA standards for the service required. Provide NEMA type 3R/12 gasketed enclosures in wet locations. Provide all starters with appropriately sized overload protection and heater strips provided in each phase, hand/off auto switches, a minimum of 2 NO and NC auxiliary contacts as required, and an integral disconnecting means. For ½ horsepower motors and below, when control requirements do not dictate the use of a

starter, a manual motor starter switch with overload protection in each phase may be provided. Acceptable manufacturers are Allen Bradley, General Electric, Square D, Furnas and Cutler Hammer.

ARTICLE 22 EQUIPMENT ROUGH-IN

22.1 Rough-in all equipment, fixtures, etc. as designed on the drawings and as specified herein. The drawings indicate only the approximate location of rough-ins. Mounting heights of all switches, receptacles, wall mounted fixtures and such equipment must be coordinated with the Architectural Designs. The Contractor shall obtain all rough-in information before progressing with any work for rough-in connections. Minor changes in the contract drawings shall be anticipated and provided for under this Division of the specifications to comply with rough-in requirements.

ARTICLE 23 OWNER FURNISHED AND OTHER EQUIPMENT

23.1 Rough-in and make final connections to all Owner furnished equipment shown on the drawings and specified, and all equipment furnished under other sections of the specifications.

ARTICLE 24 EQUIPMENT FINAL CONNECTIONS

24.1 Provide all final connections for the following:

24.1.1 All equipment furnished under this Division.

24.1.2 Electrical equipment furnished under other sections of the specification.

24.1.3 Owner furnished equipment as specified under this Division.

ARTICLE 25 INSERTS, ANCHORS, AND MOUNTING SLEEVES

25.1 Inserts and anchors must be:

25.1.1 Furnished and installed for support of work under this Division.

25.1.2 Mounting of equipment that is of such size as to be free standing and that equipment which cannot conveniently be located on walls, such as motor starters, etc., shall be rigidly supported on a framework of galvanized steel angle of Unistrut or B-line systems with all unfinished edges painted.

25.1.3 Furnish and install all sleeves as required for the installation of all work under all Sections of this Division and for all communication systems including any communication systems described in this Section which are bid to the General Contractor. Sleeves through floors, roof, and walls shall be as described in "Conduit and Fittings" Section 26 05 33.

ARTICLE 26 SEISMIC ANCHORING

- 26.1 All switchgear and other free-standing electrical equipment or enclosures shall be anchored to the floor and braced at the top of the equipment to the structure. The Contractor shall submit drawings signed by the Contractors registered structural Engineer indicating method of compliance prior installation.
- 26.2 All sound systems, communication, signal or data networking equipment or enclosures shall be anchored to the structure. The Contractor shall submit drawings signed by the Contractors registered Structural Engineer indicating method of compliance prior to installation.

ARTICLE 27 RUST PROOFING

- 27.1 Rust proofing must be applied to all ferrous metals and shall be in accordance with Section 05500 of these specifications and as noted below.
 - 27.1.1 Hot-dipped galvanized shall be applied and after forming of angle-iron, bolts, anchors, etc.
 - 27.1.2 Hot-dipped galvanized coating shall be applied after fabrication for junction boxes and pull boxes cast in concrete.

ARTICLE 28 GENERAL WIRING

- 28.1 Where located adjacent in walls, outlet boxes shall not be placed back to back, nor shall extension rings be used in place of double boxes, all to limit sound transmission between rooms. Provide short horizontal nipple between adjacent outlet boxes, which shall have depth sufficient to maintain wall coverage in rear by masonry wall.
- 28.2 In those instances where outlet boxes, recessed terminal boxes, or recessed equipment enclosures are installed in a fire rated assembly, provide "Flamesafe FSD 1077" fire stopping pads or approved equal, over the outlet or box.
- 28.3 Complete rough-in requirements of all equipment to be wired under the contract are not indicated. Coordinate with respective trades furnishing equipment or with the Architect as the case may be for complete and accurate requirements to result in a neat, workmanlike installation.

ARTICLE 29 SEPARATE CONDUIT SYSTEMS

- 29.1 Each electrical and signal system shall be contained in a separate conduit system as shown on the drawings and as specified herein. This includes each power system, each lighting system, each signal system of whatever nature, telephone, standby system, sound system, control system, fire alarm system, etc.

- 29.2 Further, each item of building equipment must have its own run of power wiring. Control wiring may be included in properly sized conduit for equipment feeders of #6 AWG and smaller, having separate conduit for larger sizes.

ARTICLE 30 CLEANUP

- 30.1 In addition to cleanup specified under other sections, thoroughly clean all parts of the equipment. Where exposed parts are to be painted, thoroughly clean off any spattered construction materials and remove all oil and grease spots. Wipe the surface carefully and scrape out all cracks and corners.
- 30.2 Use steel brushes on exposed metal work to carefully remove rust, etc., and leave smooth and clean.
- 30.3 During the progress of the work, keep the premises clean and free of debris.

ARTICLE 31 PAINTING

- 31.1 Paint all unfinished metal as required in accordance with Division 1 of these specifications. (Galvanized and factory painted equipment shall be considered as having a sub-base finish.)

ARTICLE 32 GENERAL DEMOLITION REQUIREMENTS

- 32.1 Remove existing work and items which are required to be removed in such manner that minimum damage and disturbance is caused to adjacent and connection work scheduled to remain. Repair or replace existing work schedule.
- 32.2 Include preparation of existing areas to receive new materials and removal of materials and equipment to alter or repair the existing building as indicated and as specified.
- 32.3 Perform demolition exercising proper care to prevent injury to the public, workmen and adjoining property.
- 32.4 Perform the removal, cutting, drilling of existing work with extreme care and use small tools in order not to jeopardize the structural integrity of the building.
- 32.5 Rebuild to existing condition or better, existing work which has to be removed to allow the installation of new work as required.
- 32.6 Remove, protect and reinstall existing items as indicated. Replace materials scheduled for reuse which are damaged by the Contractor to the extent that they cannot be reused, with equal quality material, and installation.
- 32.7 Do not reuse in this project materials and items removed from existing site or building, except with specific written approval by the Architect in each case, unless such removed material or item is specifically indicated or specified to be reused.

- 32.8 Remove materials and equipment indicated to be salvaged for reinstallation and store to prevent damage and reinstall as the work progresses. Do not reuse in this project, other materials and equipment removed from existing site or building, except with specific written approval by the Architect in each case.
- 32.9 Patch areas requiring patching, including damage caused by removing, relocating or adding fixtures and equipment, damages caused by demolition at adjacent materials.
- 32.10 Do not stockpile debris in the existing building, without the approval of the Architect. Remove debris as it accumulates from removal operations to a legal disposal area.
- 32.11 Contractor to assume existing oil filled and dry transformers, oil switches, ballasts, lamps, wooden poles, cross arms, computers, computer monitors, and conductor insulation containing materials considered hazardous. Comply with local, state and federal regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution. Contractor shall be responsible for removal of the above hazardous materials where encountered. Include all costs for such removal as part of this contract.
- 32.12 All fluorescent, compact fluorescent, high intensity discharge, metal halide, mercury vapor, high and low-pressure sodium, and neon lamps are to be disposed of as required by the California Waste Rule Regulations as described in the California Code of Regulations, Title 22, Division 4.5 and Chapter 23.
- 32.13 **Communication System:** Where new communication systems, (including telephone, intercom, clock, security, fire alarm, data, multimedia, CATV or lighting controls) are installed to replace existing systems, unless where otherwise directed the existing systems shall remain fully operational until the new system has been installed and tested. Demolition of the existing systems shall include removal of all equipment and associated wiring and exposed conduits and providing new blank covers for all abandoned device locations.
- 32.14 **Salvage Power Equipment:** The Contractor shall carefully remove all existing switchboards, panelboards, transformers, and confirm in writing which items the Owner wishes to keep. These items shall be transported to the Owner's maintenance facilities by the Contractor. All remaining items shall be disposed of by the Contractor.
- 32.15 **Salvage Lighting Equipment:** The Contractor shall confirm in writing which items the Owner wishes to keep. These items shall be transported to the Owner's maintenance facilities by the Contractor. All remaining items shall be disposed of by the Contractor.
- 32.16 **Salvage Communication Equipment:** The Contractor shall carefully remove all communication devices (telephone, intercom, clock, security, fire alarm, data, multimedia, CATV or lighting controls) and box each type of devices separately. The Contractor shall deliver all items to the Owner's maintenance facility.

ARTICLE 33 PROJECT CLOSEOUT

- 33.1 Prior to completion of project, compile a complete equipment maintenance manual for all equipment supplied under sections of this Division, in accordance with Division 1 of these specifications and as described below.
- 33.2 Equipment Lists and Maintenance Manuals:
- 33.2.1 Prior to completion of job, Contractor shall compile a complete equipment list and maintenance manuals. The equipment list shall include the following items for every piece of material equipment supplied under this Section of the specifications:
- 33.2.1.1 Name, model, and manufacturer.
- 33.2.1.2 Complete parts drawings and lists.
- 33.2.1.3 Local supply for parts and replacement and telephone number.
- 33.2.1.4 All tags, inspection slips, instruction packages, etc., removed from equipment as shipped from the factory, properly identified as to the piece of equipment it was taken from.
- 33.3 Maintenance manuals shall be furnished for each applicable section of the specifications and shall be suitably bound with hard covers and shall include all available manufacturers' operating and maintenance instructions, together with "as-built" drawings to properly operate and maintain the equipment. The equipment lists and maintenance manuals shall be submitted in duplicate to the Architect for approval not less than 10 days prior to the completion of the job. The maintenance manuals shall also include the name, address, and phone numbers of all subcontractors involved in any of the work specified herein. Four copies of the maintenance manuals bound in single volumes shall be provided.

ARTICLE 34 RECORD DRAWINGS

- 34.1 The Division 26 Contractor shall maintain record drawings as specified in accordance with Division 1 of these specifications, and as noted below.
- 34.2 Drawings shall show locations of all concealed underground conduit runs, giving the number and size of conduit and wires. Underground ducts shall be shown with cross section elevations and shall be dimensioned in relation to permanent structures to indicate their exact location. Drawing changes shall not be identified only with referencing CORs and RFIs, the drawings shall reflect all of the actual additions or changes made. All as-built drawing information shall be prepared by the contractor in AutoCAD, updating the contract computer files as needed to reflect actual installed conditions for all site plans, lighting, power, communication, networking, audio visual, security or fire alarms systems included in the scope of work for this project.

- 34.3 One set of these record drawings shall be delivered to the Architect. The engineer will review documents for completeness and will not be responsible for editing contractor computer files.

ARTICLE 35 CHANGES AND EXTRA WORK

- 35.1 When **changes** in work are requested, the Division 26 Contractor shall provide unit prices for the work involved in accordance with Division 1 of these specifications, and the following:

35.1.1 The material Costs shall **not exceed** the latest edition of the "Trade Service" end column "C" price list. The materials prices may be higher only where the Contractor can produce invoices to substantiate higher material costs. The Contractor shall submit a print out copy of the trade service sheets with the change order to substantiate these values.

35.1.2 The labor Costs shall **not exceed** the latest edition of the "NECA Manual of Labor Units" **normal column**.

- 35.2 When **credits** in work are requested, the Division 26 Contractor shall provide unit prices for the work involved in accordance with Division 1 of these specifications, and the following:

35.2.1 The Material Costs shall **not be less than 80% of** the latest edition of the "Trade Service" end column price list. The materials prices may be lower only where the Contractor can produce invoices to substantiate lower material costs. Restocking fees may also be included in this amount where applicable.

35.2.2 The Labor Costs shall **not be less than 80% of** the latest edition of the "NECA Manual of Labor Units" **normal column**.

- 35.3 Conduit pricing for conduits of all types sized 3" or smaller.

When changes in the scope of work require the Contractor to estimate conduit Installations, they shall **NOT include labor values (only material cost may be included)** for any of the below items. The labor values for conduit installation represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

35.3.1 Couplings.

35.3.2 Set Screw or Compression Fittings, locknuts, Bushings and washers.

35.3.3 Conduit straps and associated screws or nails.

35.3.4 LB fittings or other specialty fittings or specialty mounting hardware may be included where needed.

35.4 Wire pricing for all types and sizes.

When changes in the scope of work require the Contractor to estimate wire installations, they shall **NOT include labor values (only material cost may be included)** for any of the below items. The labor values for wire installation represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

35.4.1 Locknuts, Bushings, tape, wire markers.

35.5 When changes in the scope of work require other equipment installations such as lighting fixtures, panelboards, switchboards, wiring devices, communications equipment etc. the Contractor shall **NOT include labor values (only material cost may be included)** for any of the below items. The labor values for these equipment items represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

35.5.1 Associated screws, nails, bolts, anchors or supports.

35.5.2 Locknuts, washers, tape.

35.6 The total labor hours for extra work will be required to be calculated as follows:

35.6.1 Change orders with 1 to 30 total labor hours

General Laborer	10%	of total labor hours
Journeyman	10%	of total labor hours
Foreman	80%	of total labor hours

35.6.2 Change orders with 31 to 100 total labor hours

General Laborer	20%	of total labor hours
Journeyman	40%	of total labor hours
Foreman	40%	of total labor hours

35.6.3 Change orders with over 100 total labor hours

General Laborer	30%	of total labor hours
Journeyman	50%	of total labor hours
Foreman	20%	of total labor hours

35.7 When change orders are issued which allow the work to be completed in the normal sequence of construction, the labor rates shall be based on the most current "Prevailing Wage" – straight time total hourly rate. When change orders require the Contractor to

work out of sequence the “Prevailing Wage”– daily overtime hourly rate shall apply. Special condition situations shall be reviewed on an individual basis for alternate hourly rate schedules.

- 35.8 Costs **will not** be permitted for additional supervision on site or office time for processing any change order other than the 10% overhead allowance as described in Division 1. Cost for special equipment required to install items for an individual change order are permitted and must be individually identified. Lump Sum cost for small tools or any other cost not specifically required for the change order are not permitted.
- 35.9 Contractor estimates shall be formatted to clearly identify each of the following:
- 35.9.1 Line item description of each type of material or labor item.
 - 35.9.2 Description of quantity for each item.
 - 35.9.3 Description of (material cost per / quantity).
 - 35.9.4 Description of (labor cost per / quantity).
 - 35.9.5 Description of total labor hour breakdown per Foreman, Journeyman or General Laborer as described above.

ARTICLE 36 ELECTRONIC FILES

- 36.1 The Contractor shall make a **written** request directly to Johnson Consulting Engineers for electronic drawing files. As a part of the written request, please include the following information:
- 36.1.1 Clearly indicate each drawing sheet needed (i.e., E1.1, E2.1, etc.).
 - 36.1.2 Identify the name, phone number, mailing address and e-mail address of the person to receive the files.
 - 36.1.3 Provide written confirmation and agreement with the requirements described for payment of computer files, as described below.
- 36.2 Detail or riser diagram sheets, or any other drawings other than floor plans or site plans, **will not be made available to the Contractor.**
- 36.3 Files will only be provided in the AutoCAD format in which they were created.

END OF SECTION

SECTION 26 05 19
POWER CONDUCTORS

PART 1 – GENERAL

- 1.1 Furnish and install wire and cable for branch circuits and feeders specified herein and as shown on the electrical drawings.
- 1.2 Submittals: Submit manufacturers' data for the following items:
 - 1.2.1 All cables and terminations
- 1.3 **Common submittal mistakes which will result in the submittals being rejected:**
 - 1.3.1 Not including all items listed in the above itemized description.
 - 1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining, or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.3 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed

PART 2 – PRODUCTS

- 2.1 Wire and cable Rated 120 volt to 600 volt.
 - 2.1.1 All wire and cable shall be new, 600 volt insulated copper, of types specified below for each application. All wire and cable shall bear the UL label and shall be brought to the job in unbroken packages. Wire insulation shall be the color as specified herein and shall be type THWN-2. Insulated conductors shall be installed in all exterior exposed raceways. Conductors for branch circuit lighting, receptacle, power and miscellaneous systems shall be a minimum of No. 12 AWG. Increase conductor size to No. 10 AWG for 120 volt circuits greater than 100 feet from the panel to the load and for 277 volt circuits greater than 200 feet from the panel to the load. Circuit home-runs indicated to be larger than No. 12 must be increased the entire length of the circuit, including equipment grounding conductor. Wire sizes No. 14 through No. 10 shall be solid. No. 8 and larger shall be stranded.
 - 2.1.2 Aluminum conductors will be permitted (only where specifically identified on the drawings. See "600 Volt Feeder Schedule") in sizes 2/0 or larger. Conductors shall be listed by Underwriters Laboratories (UL) and suitable for operation at 600 volts or less, at a maximum operating temperature of 90N C

maximum in wet or dry locations. Conductors shall be marked "SUN-RES". Aluminum alloy conductors shall be compact stranded conductors of STABILOY® (AA-8030) as manufactured by Alcan Cable or Listed equal. AA-8000 Series aluminum alloy conductor material shall be recognized by The Aluminum Association.

2.1.3 MC type armored cable reference Section 26 05 33.

2.2 Wire and cable for systems below 120 volts.

2.2.1 All low voltage and communications systems cables routed underground shall be provided with a moisture resistant outer jacket, West Penn "Aquaseal" or equal, unless otherwise specified.

PART 3 - EXECUTION

3.1 Wire and cable shall be pulled into conduits without strain using powdered soapstone, mineralac, or other approved lubricant. In no case shall wire be repulled if same has been pulled out of a conduit run for any purpose. No conductor shall be pulled into conduit until conduit system is complete, including junction boxes, pull boxes, etc.

3.2 All connections of wires shall be made as noted below:

3.2.1 Connections to outlets and switches: Wire formed around binding post of screw.

3.2.2 No. 10 wire and smaller: Circuit wiring connections to lighting fixtures and other hard wired equipment shall be made with pressure type solderless connectors, Buchanan, Scotchlock, Wing Nut, or approved equal. Alternate "WAGO" #773 series or "IDEAL" #32, 33, 34 and 39 series push wire style connectors are also acceptable.

3.3 All wiring shall be continuous without splicing unless where specifically noted on the drawings or where permitted below.

3.3.1 No. 10 wire and smaller above grade: Quantities as needed, connection made with pressure type solderless connectors, Scotchlock or equal.

3.3.2 No. 10 wire and smaller below grade: Quantities as needed, connection made with 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat shrink, sealant coated splice kit. Alternate products must be UL listed for direct burial/submersible and rated to (1000V).

3.3.3 No. 8 wire and larger above grade: Quantities only where indicated, 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat

shrink, sealant coated splice kit. Alternate products must be UL listed for direct burial/submersible and rated to (1000V).

3.3.4 No. 8 wire and larger below grade: Quantities only where indicated, 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat shrink, sealant coated splice kit. Alternate products must be UL listed for direct burial/submersible and rated to (1000V).

3.4 All wiring throughout shall be color coded as follows:

	<u>480 volt system</u>	<u>208 or 240 volt system</u>
A Phase	Brown	Black
B Phase	Orange	Red
C Phase	Yellow	Blue
Neutral	Grey	White
Ground	Green	Green

3.5 Wiring must be color coded throughout its entire length, except feeders may have color coded plastic tape at both ends and any other accessible point.

3.6 All control wiring in a circuit shall be color coded, each phase leg having a separate color, and with all segments of the control circuit, whether in apparatus or conduit, utilizing the same color coding.

3.7 At all terminations of control wiring, the wiring shall have a numbered T&B or Brady plastic wire marker.

3.8 Cables when installed are to be properly trained in junction boxes, etc., and in such a manner as to prevent any forces on the cable which might damage the cable.

3.9 All conductors to be installed into a common raceway, shall be pulled into the raceway at the same time.

3.10 All conductors shall be installed in such a manner as to not exceed the manufacturers' recommended pulling tension and bending radius. The equipment used for pulling must be specifically designed for the purpose. Motorized vehicles such as pickup trucks, are not acceptable.

END OF SECTION

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SECTION 26 05 26

GROUNDING

PART 1 – GENERAL

- 1.1 Furnish and install grounding and grounding conductors and electrodes as specified herein and as shown on the drawings.
- 1.2 Submit catalog data for all components.
- 1.3 **Common submittal mistakes which will result in the submittals being rejected:**
 - 1.3.1 Not including all items listed in the above itemized description.
 - 1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.3 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – EXECUTION

- 2.1 Grounding
 - 2.1.1 All panelboard cabinets, equipment, enclosures, and complete conduit system shall be grounded securely in accordance with pertinent sections of CEC Article 250. Conductors shall be copper. All electrically operated equipment shall be bonded to the grounded conduit system. All non-current carrying conductive surfaces that are likely to become energized and subject to personal contact shall be grounded by one or more of the methods detailed in CEC Article 250. All ground connections shall have clean contact surfaces. Install all grounding conductors in conduit and make connections readily accessible for inspection.
 - 2.1.2 Provide an insulated equipment grounding conductor in all branch circuit and feeder raceway systems, sized in accordance with CEC 250-1122.
 - 2.1.3 Provide an additional individual insulated grounding conductor for each circuit which contains an isolated ground receptacle or surge suppression receptacle.
 - 2.1.4 Grounding of metal raceways shall be assured by means of provisions of grounding bushings on feeder conduit terminations at the panelboard, and by

means of insulated continuous stranded copper grounding wire extended from the ground bus in the panelboard to the conduit grounding bushings.

2.1.5 Except for connections which access for periodic testing is required, make grounding connections which are buried or otherwise inaccessible by exothermite type process.

2.1.6 The following ohmic values shall be test certified for each item listed. A written report signed and witnessed by the project IOR shall be provided to the engineer. If the ohmic value listed cannot be obtained additional grounding shall be installed to reach the value listed.

2.1.6.1 Service.10 ohms.

2.1.6.2 Step down transformers and non-current carrying metal parts
. 25 ohms.

2.1.6.3 Manholes, handholes, etc.
. 10 ohms.

END OF SECTION

SECTION 26 05 33
CONDUIT AND FITTINGS

PART 1 – GENERAL

- 1.1 Furnish and install conduit and fittings as shown on the drawings and as specified herein.
- 1.2 Submit Manufacturer's data on the following:
 - 1.2.1 Conduit.
 - 1.2.2 Fittings
 - 1.2.3 Fire stopping Material.
 - 1.2.4 Surface Raceways.
 - 1.2.5 Type MC or MC-PCS cable, provide construction details and UL "E" number.
- 1.3 **Common submittal mistakes which will result in the submittals being rejected:**
 - 1.3.1 Not including all items listed in the above itemized description.
 - 1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.3 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

- 2.1 Rigid steel conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT) and flexible metallic conduit shall be steel, hot dipped galvanized after fabrication.
- 2.2 PVC conduit shall be Carlon or approved equal.
- 2.3 Liquid tight flexible metal conduit shall be Anaconda Sealtite type UA or approved equal. Fittings shall be Appleton, Crouse-Hinds, Steel City, T&B, or equivalent.
- 2.4 MC type armored cable, when utilized, shall be provided with the following:
 - 2.4.1 Comply with UL 1479 and CEC 330

- 2.4.2 90°C, copper, THHN conductors.
- 2.4.3 Minimum #12 insulated grounding conductor.
- 2.4.4 Conductors sized No. 10 and smaller shall be solid, No. 8 and larger shall be stranded.
- 2.4.5 Oversized (150%) neutrals or separate neutrals shall be provided.
- 2.4.6 Increase phase conductors to No. 10 AWG for 120 volt circuits greater than 100 feet from panel to load and for 277 volt circuits greater than 200 feet from panel to load. Where required increase conductor sizes for entire length of circuit.
- 2.4.7 Interlocked armored aluminum sheath.
- 2.4.8 AC or BX type armored cable shall not be substituted in lieu of MC type cable.
- 2.4.9 Color code cable according to cable type and configuration.
- 2.4.10 Acceptable manufacturers are AFC and Alflex.
- 2.5 MC-PCS luminary armored cable , when utilized, shall be provided with the following:
 - 2.5.1 Comply with UL 1479 and CEC 330
 - 2.5.2 90°C, copper, THHN conductors.
 - 2.5.3 Minimum #12 insulated grounding conductor.
 - 2.5.4 Lighting phase conductors sized No. 10 and smaller shall be solid, lighting control conductors shall be sized no. 16 solid.
 - 2.5.5 Interlocked armored aluminum sheath.
 - 2.5.6 AC or BX type armored cable shall not be substituted in lieu of MC type cable.
 - 2.5.7 Color code phase cable according to cable type and configuration. color code control conductors purple/gray.
 - 2.5.8 Acceptable manufacturers are AFC and Alflex.
- 2.6 Fire stopping material shall provide an effective seal against fire, heat, smoke and fire gases. Fire stopping material shall be tested to comply with ASTM E 814 and UL 1479. The submittal for this product shall include the UL listed system number and installation requirements for each type of penetration seal required for this project.

- 2.7 Each length of conduit shall be stamped with the name or trademark of the manufacturer and shall bear the UL label.
- 2.8 All plastic conduit shall be rigid, schedule 40, heavy wall PVC. All PVC conduit shall be UL listed. Underground utility company conduits shall comply with local utility co. requirements.
- 2.9 Plastic conduit shall be stored on a flat surface, and protected from the direct rays of the sun.

PART 3 – FITTINGS

- 3.1 All metallic fittings, including those for EMT, flexible conduit, or malleable iron. Die cast fittings of any other material are not permitted.
- 3.2 Locknuts shall be steel or malleable iron with sharp clean cut threads.
- 3.3 Entrance seals shall be O.Z. type FSK or equivalent.
- 3.4 Bushings and locknuts: Where conduits enter boxes, panels, cabinets, etc., they shall be rigidly clamped to the box by locknuts on the outside, and a lock nut and plastic bushing on the inside of the box. All conduits shall enter the box squarely.
- 3.5 Furnish and install insulated bushings as per CEC article No. 300 - 4 (F) on all conduits. The use of insulated bushings does not exclude the use of double locknuts to fasten conduit to the box.
- 3.6 Transition from plastic to steel conduits shall be with PVC female threaded adaptors.
- 3.7 Couplings and connectors for rigid steel or IMC conduit must be threaded, or compression type (set screw fittings are not permitted).
- 3.8 Couplings and connectors for EMT shall be compression, watertight. Set screw connectors are not acceptable, except for systems below 120 volts.
- 3.9 MC or MC-PCS type armored cable shall be provided with listed clamp type die cast zinc set screw connectors. Anti-short bushings shall be provided at all cable ends.
- 3.10 Connectors for flexible metal conduit shall be steel or malleable iron with screw provided to clinch the conduit into the adapter body. For sizes up to ¾" a screw-in, "Jake type," fitting may be used.
- 3.11 Install approved expansion fittings, or liquid tight flex conduit with a minimum 6" slack for conduits passing through all expansion and seismic joints.

PART 4 - EXECUTION

- 4.1 All branch circuits shall be installed concealed in walls or above ceilings or in concrete floor slabs. PVC conduits installed in concrete floor slabs shall transition to PVC coated rigid steel where conduits penetrate above finished grade or finished floor.
- 4.2 Conduit sizes for various numbers and sizes of wire shall be as required by the CEC, but not smaller than ½" for power wiring and ¾" for communications and fire alarm systems unless otherwise noted. Conduit in slab or below grade shall be ¾" minimum trade size, unless otherwise identified.
- 4.3 Conduit size shall be such that the required number and sizes of wires can be easily pulled in and the Contractor shall be responsible for the selection of the conduit sizes to facilitate the ease of pulling. Conduit sizes shown on the drawings are minimum sizes in accordance with appropriate tables in the CEC. If because of bends or elbows a larger conduit size is required, the Contractor shall so furnish without further cost to the Owner.
- 4.4 The Contractor shall be entirely responsible for the proper protection of this work from the other trades on the job. When conduit becomes bent or holes are punched through same, or outlets moved after being roughed-in, the Contractor shall replace same, without additional cost to the Owner.
- 4.5 Rigid steel conduit or IMC shall be used as follows:
 - 4.5.1 Exposed exterior locations.
 - 4.5.2 Exposed interior locations below eight feet above floor, except in electrical rooms and closets.
 - 4.5.3 In hazardous or classified areas as required by CEC.
- 4.6 EMT conduit shall be used for areas as follows:
 - 4.6.1 All interior communications, signal, and data networking systems.
 - 4.6.2 All interior power wiring systems where not required to be in rigid steel, IMC or flexible conduit.
- 4.7 Flexible conduit shall be used for areas as follows:
 - 4.7.1 To connect motors, transformers, and other equipment subjected to vibration or where specifically detailed on the drawings.
 - 4.7.2 Flexible conduit shall not be used to replace EMT in other locations where the conduit will be exposed.

- 4.7.3 Flexible metal conduit shall be ferrous. Installation shall be such that considerable slack is realized. The conduit shall contain separate code sized grounding conductor.
- 4.7.4 Liquid tight flexible conduit shall be used in conformance with CEC in lengths not to exceed 4'. For equipment connections, route the conduit at 90 degrees to the adjacent path for point of connection. The conduit shall contain separate code sized grounding conductor. Use liquid tight flexible conduit for all equipment connections exposed in possible wet, corrosive or oil contaminated areas, e.g., shops and outside areas.
- 4.8 MC armored cable may be used as follows:
 - 4.8.1 All branch circuit wiring for lighting and power circuits where permitted and installed in compliance with UL 1569 and CEC 330.
- 4.9 MC-PCS luminary armored cable may be used as follows:
 - 4.9.1 All Lighting branch circuit wiring for lighting circuits where permitted and installed in compliance with UL 1569 and CEC 300-22(c), 330. This cable permits conductors of control circuits to be placed in a cable with lighting power circuits or class 1 circuits.
 - 4.9.2 It shall not be considered an acceptable option to install lighting control class 1 circuits as an open wire installation.
- 4.10 MC and MC-PCS armored cable shall **not** be used for the following areas:
 - 4.10.1 Any exterior, underground or buried in concrete circuits.
 - 4.10.2 Any circuits feeding HVAC equipment or pumps or any circuit with 30 AMPs or greater overcurrent protection.
 - 4.10.3 Any exposed interior locations except in electrical, communication or mechanical equipment rooms.
 - 4.10.4 Any exposed interior damp/wet locations, kitchens, science classrooms, shop areas, or concealed in science classroom casework, unless provided with approved PVC jacket.
 - 4.10.5 Any hazardous rated area.
- 4.11 Plastic conduit shall be used for all exterior underground, in slab, and below slab on grade conduit installations. Install bell ends at all conduit terminations in manholes and pull boxes. Where plastic conduit transitions from below grade to above grade, no plastic conduit shall extend above finished exterior grade, or above interior finished floor level.

- 4.12 Plastic conduit joints shall be made up in accordance with the manufacturer's recommendations for the particular conduit and coupling selected. Conduit joint couplings shall be made watertight. Plastic conduit joints shall be made up by brushing a plastic solvent cement on the inside of a plastic fitting and on the outside of the conduit ends. The conduit and fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly.
- 4.13 All underground conduit depths shall be as detailed on the drawings or a minimum of 30" below finished grade (when not specifically detailed otherwise), for all exterior underground conduits. Where concrete slurry or concrete encasement is provided, include "Red" color dye in mixture.
- 4.14 All underground conduits for power systems (600v and higher), shall be concrete encased and a minimum of 48" below grade or as detailed on the drawings. Where concrete slurry or concrete encasement is provided, include "Red" color dye in mixture.
- 4.15 Conduit shall be continuous from outlet to outlet, cabinet or junction box, and shall be so arranged that wire may be pulled in with the minimum practical number of junction boxes.
- 4.16 All conduits shall be concealed wherever possible. All conduit runs may be exposed in mechanical equipment rooms, electrical equipment rooms, electrical closets, and in existing or unfinished spaces. No conduit shall be run exposed in finished areas without the specific approval of the Architect.
- 4.17 All raceways which are not buried or embedded in concrete shall be supported by straps, clamps, or hangers to provide a rigid installation. Exposed conduit shall be run in straight lines at right angles to or parallel with walls, beams, or columns. In no case shall conduit be supported or fastened to other pipes or installed to prevent the ready removal of other trades piping. Wire shall not be used to support conduit.
- 4.18 It shall be the responsibility of the Contractor to consult the other trades before installing conduit and boxes. Any conflict between the location of conduit and boxes, piping, duct work, or structural steel supports, shall be adjusted before installation. In general, large pipe mains, waste, drain, and steam lines shall be given priority.
- 4.19 Conduits above lay-in grid type ceilings shall be installed in such a manner that they do not interfere with the "lift-out" feature of the ceiling system. Conduit runs shall be installed to maintain the following minimum spacing wherever practical.
- 4.19.1 Water and waste piping not less than 3".
- 4.19.2 Steam and steam condensate lines not less than 12".
- 4.19.3 Radiation and reheat lines not less than 6".

- 4.20 Provide all necessary sleeves and chases required where conduits pass through floors or walls as part of the work of this section. Core drilling will only be permitted where approved by the Architect.
- 4.21 All empty conduits and surface mounted raceways shall be provided with a ¼" polypropylene plastic pull cord and threaded plastic or metal plugs over the ends. Fasten plastic "Dymo" tape label to exposed spare conduit to identify "power" or "communication" system, and to where it goes.
- 4.22 The ends of all conduits shall be securely plugged, and all boxes temporarily covered to prevent foreign material from entering the conduits during construction. All conduit shall be thoroughly swabbed out with a dry swab to remove moisture and debris before conductors are drawn into place.
- 4.23 Bending: Changes in direction shall be made by bends in the conduit. These shall be made smooth and even without flattening the pipe or flaking the finish. Bends shall be of as long a radius as possible, and in no case smaller than CEC requirements.
- 4.23.1 For power conduits for conductors (600v and below), provide minimum 36" radius (vertical) and 72" radius (horizontal) bends.
- 4.23.2 For power conduits for conductors (greater than 600v), provide minimum 72" radius (vertical) and 72" radius (horizontal) bends.
- 4.24 Supports: Conduit shall be supported at intervals as required by the California Electrical Code. Where conduits are run individually, they shall be supported by approved conduit straps or beam clamps. Straps shall be secured by means of toggle bolts on hollow masonry, machine screws or bolts on metal surfaces, and wood screws on wood construction. **[No perforated straps or wire hangers of any kind will be permitted. Where individual conduits are routed, or above ceilings, they shall be supported by hanger rods and hangers.]** Conduits installed exposed in damp locations shall be provided with clamp backs under each conduit clamp, to prevent accumulation of moisture around the conduits.
- 4.25 Where a number of conduits are to be run exposed and parallel, one with another, they shall be grouped and supported by trapeze hangers. Hanger rods shall be fastened to structural steel members with suitable beam clamps or to concrete inserts set flush with surface. A reinforced rod shall be installed through the opening provided in the concrete inserts. Beam clamps shall be suitable for structural members and conditions. Rods shall be galvanized steel 3/8" diameter minimum. Each conduit shall be clamped to the trapeze hanger with conduit clamps.
- 4.26 All concrete inserts and pipe clamps shall be galvanized. All steel bolts, nuts, washers, and screws shall be galvanized or cadmium plated. Individual hangers, trapeze hangers and rods shall be prime-coated.

- 4.27 Openings through fire rated floors/walls and/or smoke walls through which conduits pass shall be sealed by Fire stopping material to comply with Division 1 to seal off flame, heat, smoke and fire gases. Sleeves shall be provided for power or communication system cables which are not installed in conduits, and shall be sealed inside and out to comply with manufacturers UL system design details. Where multiple conduits and/or cable tray systems pass thru fire-rated walls at one location, the Contractor shall submit copies of the manufacturers UL system design details proposed for use on this project. All Fire stopping material shall have an hourly fire-rating equal to or higher than the fire rating of the floor or wall through which the conduit, cables, or cable trays pass.
- 4.28 Provide cap or other sealing type fitting on all spare conduits. Conduits stubbed into buildings from underground where cable only extends to equipment, the conduit/cable end shall be sealed to prevent moisture from entering the room or space.
- 4.29 All conduits which are part of a paralleled feeder or branch circuit shall be installed underground.
- 4.30 All conduits which are required as a part of systems specified in Divisions 27 or 28, or any other low voltage communication systems, shall be furnished and installed by the Division 26 Contractor.
- 4.30.1 The Contractor shall coordinate all conduit requirements with each system supplier prior to bid to determine special conduit system requirements.
- 4.30.2 The Contractor shall provide a pull rope in all conduits for these systems.
- 4.30.3 The Contractor shall provide conduit sleeves for all open cable installations thru rated walls or block walls. Provide conduit from each building main termination cabinet or backboard to the nearest accessible ceiling for access into all electrical or communications rooms.
- 4.31 In addition to the above requirements, the following requirements shall apply to all data networking conduits:
- 4.31.1 Flexible metal conduit may only be used where required at building seismic and/or expansion joints.
- 4.31.2 All underground conduits shall be provided with minimum 24" radius elbows (vertical) and 60" (horizontal).
- 4.31.3 No length of conduit above grade shall be installed to exceed 150 feet between pull boxes, or points of connection, unless where specifically detailed on the drawings.
- 4.31.4 No length of conduit shall be installed to exceed two 90 degree bends between pull boxes, or points of connection, unless where specifically detailed on the drawings.

- 4.32 Where surface raceways are installed in interior spaces, the Contractor shall take care to route in straight lines at right angles to or parallel with walls, beams, or columns. All raceways and device boxes shall be securely screwed to the finish surface with zinc screw “Auger” anchors Stk #ZSA1K by Gray Bar Electric or equal. Tape adhesive application will not be permitted.
- 4.33 The Contractor who installs surface raceway systems shall provide and install complete with wire retention clips, one for every (8) vertical feet or (5) horizontal feet or portion thereof. This Contractor shall also provide each raceway channel with pull strings.
- 4.34 It shall be the responsibility of the Contractor installing the raceway to coordinate the installation of raceway device plates and inserts with the communications or data contractors.
- 4.35 MC or MC-PCS cable shall be cut using a specific metallic sheath armor stripping tool. The use of hacksaws, dikes or any other tools not specifically designed to remove the armor sheath will not be permitted.
- 4.36 MC or MC-PCS cables installed in attic spaces or above lay-in ceilings shall be installed to be protected from physical damage. The cable shall be mounted along the sides or bottom of joists, rafters or studs.
- 4.37 Support wires used for supporting ceilings, lighting fixtures or other equipment items shall **not** be used to support MC or MC-PCS cables. Conduits, duct work, piping or any other equipment shall not be used to support or mount MC cables.
- 4.38 MC or MC-PCS cable supports, fasteners and clips shall be designed specifically for use with MC cables. Standard conduit supports, fasteners and clips, nails or other items are not permitted for installing MC cables.

END OF SECTION

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SECTION 26 05 34
OUTLET AND JUNCTION BOXES

PART 1 – GENERAL

- 1.1 Furnish and install electrical wiring boxes as specified and as shown on the electrical drawings.
- 1.2 Submit manufacturer's data for all items.
- 1.3 **Common submittal mistakes which will result in the submittals being rejected:**
 - 1.3.1 Not including all items listed in the above itemized description.
 - 1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.3 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

- 2.1 Boxes shall be as manufactured by Steel City, Appleton, Raco, or approved equal.
- 2.2 All boxes must conform to the provisions of Article 370 of the CEC. All boxes shall be of the proper size to accommodate the quantity of conductors enclosed in the box. Minimum box size shall be 4" square x 1-½" deep.
- 2.3 Boxes generally shall be hot dipped galvanized steel with knockouts. Boxes on exterior surfaces or in damp locations shall be corrosion resistant, cast ferrous and shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Boxes shall be Appleton Type FS, Crouse-Hinds, or the approved equal. Conduit bodies shall be corrosion resistant, cast malleable iron. Conduit bodies shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Conduit bodies shall be Appleton Unilets, Crouse-Hinds, or the approved equal. Where recessed, boxes shall have square cut corners.
- 2.4 Deep boxes shall be used in wall covered by wainscot or paneling and in walls or glazed tile, brick, or other masonry which will not be covered with plaster. Through the wall type boxes shall not be used unless specifically called for. All boxes shall be nongangable. Boxes in concrete shall be of a type to allow the placing of conduit without displacing the reinforcing bars. All lighting fixture outlet boxes shall be equipped with the proper fittings to support and attach a light fixture.

- 2.5 All light, switch, receptacle, fire alarm devices and similar outlets shall be provided with approved boxes, suitable for their function. Back boxes shall be furnished and installed as required for the equipment and/or systems under this contract.
- 2.6 Pull and junction boxes shall be code gauge boxes with screw covers. Boxes shall be rigid under torsional and deflecting forces and shall be provided with angle from framing where required. Boxes shall be 4" square with a blank cover in unfinished areas and with a plaster ring and blank cover in finished areas. Covers for flush mounted oversized boxes shall extend $\frac{3}{4}$ " past boxes all around. Covers for 4" square boxes shall extend $\frac{1}{4}$ " past box all around.
- 2.7 All terminal cabinets and junction boxes or equipment back boxes which are required as a part of systems specified in Divisions 27 or 28, or any other low voltage communication systems, shall be furnished and installed by the Division 26 Contractor.
- 2.7.1 The Division 26 Contractor shall coordinate all box requirements with each system supplier prior to bid to determine special cabinet or back box requirements. The Contractor shall also provide stainless steel blank cover plates for all low voltage systems installed for future equipment.
- 2.7.2 The Contractor shall provide all plywood backboards indicated on walls or inside equipment enclosures. All backboards shall be a minimum of $\frac{3}{4}$ " thick fire rated type plywood.
- 2.7.3 The Contractor shall coordinate exact rough in locations and requirements with each system supplier.
- 2.8 In addition to the above requirements, boxes for data networking wiring and equipment shall comply with the following:
- 2.8.1 All boxes shall be a minimum of 4-11/16" square x 2-1/8" deep.
- 2.8.2 Where pull boxes are required on individual conduits 1- $\frac{1}{4}$ " or smaller, provide 4-11/16" square x 2-1/8" deep boxes. Where pull boxes are required on conduits larger than 1- $\frac{1}{4}$ " for straight pull through, provide eight times the conduit trade size for box length. Where pull boxes are required on conduits larger than 1- $\frac{1}{4}$ " for an angle or a U-pull through installation, provide a minimum distance of six times the conduit trade size between the entering and exiting conduit run for each cable.
- 2.9 Recessed boxes installed in fire rated floors/walls and /or smoke walls shall be sealed by Fire stopping material to comply with Division 1 to seal off flame, heat, smoke and fire gases. The Contractor shall submit copies of the manufacturers UL system design details proposed for use on this project. All Fire stopping material shall have an hourly fire-rating equal to or higher than the fire rating of the floor or wall through which the conduit, cables, or cable trays pass.

PART 3 – EXECUTION

- 3.1 Boxes shall be installed where required to pull cable or wire, but in finished areas only by approval of the Architect. Boxes shall be rigidly attached to the structure, independent of any conduit support. Boxes shall have their covers accessible. Covers shall be fastened to boxes with machine screws to ensure continuous contact all around. Covers for surface mounted boxes shall line up evenly with the edges of the boxes.
- 3.2 Outlets are only approximately located on the plans and great care must be used in the actual location of the outlets by consulting the various detailed drawings and specifications. Outlets shall be flush with finished wall or ceiling, boxes installed symmetrically on such trim or fixture. Refer to drawings for location and orientation of all outlet boxes.
- 3.3 Furnish and install all plaster rings as may be required. Plaster rings shall be installed on all boxes where the boxes are recessed. Plaster rings shall be of a depth to reach the finished surface. Where required, extension rings shall be installed so that the plaster ring is flush with the finished surface.
- 3.4 All cabinets and boxes shall be secured by means of toggle bolts on hollow masonry; expansion shields and machine screws or standard precast inserts on concrete or solid masonry; machine screws or bolts on metal surfaces and wood screws on wood construction. All wall and ceiling mounted outlet boxes shall be supported by bar supports extending from the studs or channels on either side of the box. Boxes mounted on drywall or plaster shall be secured to wall studs or adequate internal structure.
- 3.5 Boxes with unused punched-out openings shall have the openings filled with factory-made knockout seals.
- 3.6 Where standby power and normal power are to be located in the same outlet box or 480V in a switch box, install partition barriers to separate the various systems.
- 3.7 All device boxes and junction boxes for fire alarm system shall be painted red and shall be 4-11/16" square by 2-1/8" deep. No exceptions.

END OF SECTION

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SECTION 26 08 00
COMMISSIONING OF ELECTRICAL SYSTEMS

PART 1 – GENERAL

RELATED DOCUMENTS

- 1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01, 27, 28 Specification Sections, apply to this Section.
- 1.2 Acceptance and start-up testing requirements for electrical power distribution equipment and systems. Contractor shall retain and pay for the services of a recognized, independent testing firm for the purpose of performing inspections and tests as herein specified and as required by code.
 - 1.2.1 The testing firm shall provide all material, equipment, labor, and technical supervision to perform such tests and inspections.
 - 1.2.2 It is the purpose of these tests to assure that all tested electrical equipment is operational and within industry and manufacturers tolerances, and is installed in accordance with design specifications.
 - 1.2.3 The tests and inspections shall determine suitability for start-up and energization.
 - 1.2.4 The following equipment shall be tested and calibrated:
 - 1.2.4.1 Low voltage switches, fuses, and circuit breakers, 100A frame and larger.
 - 1.2.4.2 Low voltage cables and feeders.
 - 1.2.4.3 Protective relays, instruments, and metering systems.

CODES, STANDARDS, AND REFERENCES

- 1.3 All inspections and tests shall be in accordance with the following codes and standards except as provided otherwise herein.
 - 1.3.1 ANSI/IEEE C2: National Electrical Safety Code (NESC).
 - 1.3.2 ANSI/NFPA 70: National Electrical Code, with California Amendments (CEC).
 - 1.3.3 ANSI/NFPA 70E: Standard for Electrical Safety in the Workplace.
 - 1.3.4 ANSI/NFPA 78: Lightning Protection Code.
 - 1.3.5 ANSI/NFPA 101: Life Safety Code.

- 1.3.6 American Society for Testing and Materials – ASTM.
- 1.3.7 Applicable State and Local Codes, Ordinances and Standards, including City of San Diego, San Diego Gas & Electric, and San Diego Unified School District.
- 1.3.8 California Code of Regulations (CCR), Title 8, Title 24.
- 1.3.9 Division 1, Section 019113, “General Commissioning Requirements”.
- 1.3.10 Institute of Electrical and Electronic Engineers – IEEE.
- 1.3.11 Insulated Cable Engineers Association – ICEA.
- 1.3.12 International Electrical Testing Association - NETA Accept: The NETA Acceptance Testing Specifications, latest edition.
- 1.3.13 National Electrical Manufacturers Association – NEMA.
- 1.3.14 Occupational Safety and Health Administration (OSHA) – 29 CFR 1910.7: OSHA Occupational Safety and Health Standards.

QUALIFICAITONS OF TESTING FIRM

- 1.4 All Inspections and tests shall utilize the following references:
 - 1.4.1 Project design specifications.
 - 1.4.2 Project design drawings
 - 1.4.3 Project list of equipment to be inspected and tested
 - 1.4.4 Manufacturer’s instruction manuals applicable to each particular equipment.
- 1.5 The testing firm shall be an independent testing organization with the experience and capability to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
- 1.6 The testing firm shall be regularly engaged in the testing of electrical equipment devices, installations, and systems, with at least five (5) years of documented experience.
- 1.7 The lead, on-site, technical person shall be currently certified by the International Electrical Association (NETA), or National Institute for Certification in Engineering Technologies (NICET) in electrical power distribution system testing.
- 1.8 The testing firm shall utilize engineers and technicians who are regularly employed by the firm for testing services.

- 1.9 The testing firm shall submit proof of the above qualifications with bid documents when requested.
- 1.10 The terms used herein, such as Testing Agency, Testing Contractor, Testing Laboratory, or Contractor Test Company, shall be construed to mean the testing firm.

SUBMITTALS

- 1.11 Provide submittals per Division 1, Section 013300, "Submittal Procedures".
- 1.12 Qualifications of testing firm and personnel.
- 1.13 Certified test reports.
- 1.14 Two copies of blank forms for checklists, test reports, and other related forms for Engineer's review and approval.

GENERAL REQUIREMENTS

- 1.15 Routine insulation resistance, continuity, and rotation tests for all distribution and utilization equipment shall be performed prior to and in addition to acceptance tests specified herein.
- 1.16 The Testing Firm shall notify the Engineer no fewer than 3 working days prior to commencement of any testing.
- 1.17 Any system, material, or workmanship, which is found defective on the basis of Acceptance Tests shall be reported to the Engineer with recommendations for corrective action.
- 1.18 The Testing Firm shall maintain a written record of all tests, and upon completion of project, shall assemble and certify a final test report.
- 1.19 The final Test Report shall be submitted on conclusion of all required tests and corrective measures.

SAFETY AND PRECAUTIONS

- 1.20 Safety practices shall include, but will not be limited to, compliance with the following requirements:
 - 1.20.1 Occupational Safety and Health Act.
 - 1.20.2 Accident Prevention Manual for Industrial Operations, National Safety Council.
 - 1.20.3 Applicable State and Local safety operating procedures.
 - 1.20.4 Owners' Safety Practices.

1.20.5 National Fire Protection Association – NFPA 70E.

1.20.6 American National Standards for Personnel Protection.

1.21 All tests shall be performed with apparatus de-energized. Exceptions must be thoroughly reviewed to identify safety hazards and adequate safeguards must be devised.

1.22 The Testing Firm shall have a designated safety representative on the project site to supervise the testing operations with respect to safety.

1.23 Test Report:

1.23.1 The test report shall include the following:

1.23.1.1 Summary of Project.

1.23.1.2 List of testing equipment used.

1.23.1.3 Calibration date of testing equipment and due date of next calibration.

1.23.1.4 Ambient temperature and humidity at time of test.

1.23.1.5 Listing of equipment tested.

1.23.1.6 Test results.

1.23.1.7 Recommendations.

1.23.2 Furnish original and four copies of the complete report to the Architect/District in accordance with requirements of Contract Documents.

INSPECTION AND TEST PROCEDURES

1.24 Contractor shall provide the Testing Firm, a copy of related contract documents such as drawings, specifications, engineer-reviewed submittals, coordination study report including all relay settings and other necessary information.

1.25 Contractor shall supply a suitable source of power to each site and location per testing firm requirements.

1.26 Contractor shall notify the testing firm when equipment becomes available for acceptance tests. Work shall be coordinated to expedite project scheduling.

1.27 Testing Firm shall review and evaluate all received documents and notify the Contractor and Engineer of any discrepancies in the documents and/or any other requirements immediately.

- 1.28 Testing Firm shall provide and comply with the following:
 - 1.28.1 Acceptance test procedures for each individual equipment listed in Part 1 of this section for Engineer review and approval prior to any test and after thorough evaluation of the system. Testing shall conform to the International Electrical Testing Association (NETA) specifications and standards for electrical power distribution equipment and systems and manufacturer's instructions.
 - 1.28.2 Refer to each individual specification section for testing requirements and comply.
 - 1.28.3 Inspect installed equipment and report any discrepancy and/or deficiency with respect to the contract documents and governing codes prior to testing.

SYSTEM FUNCTION TEST

- 1.29 Perform system function test upon completion of equipment tests as defined in this section. It is the purpose of system function tests to verify proper interaction of all sensing, processing, and action devices.
- 1.30 Implementation.
- 1.31 Submit manufacturers' data on all items:
 - 1.31.1 Develop test parameters for the purpose of evaluation performance of all integral components and their functioning as a complete unit within design requirements.
 - 1.31.2 Test all interlocking devices.
 - 1.31.3 Record the operation of alarms and indicating devices.
- 1.32 DEFICIENCIES
- 1.33 Submit manufacturers' data on all items.
 - 1.33.1 All deficiencies reported by the Testing Firm shall be corrected by the Contractor and Acceptance and System Function Tests shall be repeated to verify conformance with requirements.

PART 2 – PRODUCTS

- 2.1 Not applicable

PART 3 - EXECUTION

- 3.1 Not applicable

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SECTION 26 09 23
DIGITAL LIGHTING CONTROL SYSTEM

PART 1 – GENERAL

- 1.1 Furnish and install automatic lighting controls as shown on the drawings and as specified herein Submit manufacturers' data on all items.
- 1.2 Equipment shall be UL listed, comply with those portions of CEC as applicable to electrical wiring work and comply with those portions of NEMA or UL pertaining to types of electrical equipment and enclosures. The equipment shall also be certified by the California Energy Commission.
- 1.3 The manufacturer of the lighting control equipment shall have been actively engaged in the manufacture of the types and capacities required for the application for at least three years. It is the sole responsibility of the Division 26 contractor to ensure that submittals of material meets the performance specifications contained herein.
- 1.4 All components and assemblies shall be factory pre-tested and burned-in as a system for 48 hours prior to shipping.
- 1.5 Control Intent – Control Intent includes, but is not limited to:
 - 1.5.1 Defaults and initial calibration settings for such items as time delay, sensitivity, fade rates, etc.
 - 1.5.2 Initial sensor and switching zones
 - 1.5.3 Initial time switch settings
 - 1.5.4 Task lighting and receptacle controls
 - 1.5.5 Emergency Lighting control (if applicable)
 - 1.5.6 Manufacturer shall submit a point-to-point line diagram of the system configuration including all devices and accessories required to complete the system.
 - 1.5.7 Manufacturer shall submit data sheets on the components and system submitted, with descriptions of hardware and software components.

SYSTEM DESCRIPTION & OPERATION

- 1.6 The Lighting Control and Automation system as defined under this section covers the following equipment:

- 1.6.1 Digital Occupancy Sensors – Self-configuring, digitally addressable and calibrated occupancy sensors with LCD display and two-way active infrared (IR) communications
- 1.6.2 Digital Switches – Self-configuring, digitally addressable pushbutton on/off, dimming, and scene switches with two-way active infrared (IR) communications
- 1.6.3 Handheld remotes for personal control – One-button dimming, two-button on/off, or five-button scene remotes provide control using infrared communications. Remote may be configured in the field to control selected loads or scenes without special tools
- 1.6.4 Digital Daylighting Sensors – Single-zone closed loop, multi-zone open loop and single-zone dual-loop daylighting sensors with two-way active infrared (IR) communications can provide switching, bi-level, tri-level or dimming control for daylight harvesting
- 1.6.5 Digital Room Controllers – Self-configuring, digitally addressable one, two or three relay plenum-rated controllers for on/off control. Selected models include 0-10 volt or line voltage forward phase control dimming outputs and integral current monitoring capabilities
- 1.6.6 Digital Plug-Load Controllers – Self-configuring, digitally addressable, single relay, plenum-rated application-specific controllers. Selected models include integral current monitoring capabilities
- 1.6.7 Configuration Tools – Handheld remote for room configuration and relay panel programming provides two way infrared (IR) communications to digital devices and allows complete configuration and reconfiguration of the device / room from up to 30 feet away. Unit to have Organic LED display, simple pushbutton interface, and allow bi-directional communication of room variables and occupancy sensor settings. Computer software also customizes room settings
- 1.6.8 Digital Lighting Management (DLM) local network – Free topology, plug-in wiring system (Cat 5e) for power and data to room devices
- 1.6.9 Digital Lighting Management (DLM) segment network – Linear topology, BACnet MS/TP network (1.5 twisted pair, shielded,) to connect multiple DLM local networks for centralized control
- 1.6.10 Network Bridge – provides BACnet MS/TP-compliant digital networked communication between rooms, panels and the Segment Manager or building automation system (BAS) and automatically creates BACnet objects representative of connected devices.
- 1.6.11 Segment Manager – provides web browser-based user interface for system control, scheduling, power monitoring, room device parameter administration and reporting

- 1.6.12 Programming and Configuration software – Optional PC-native application capable of accessing DLM control parameters within a room, for the local network, via a USB adapter, or globally, for many segment networks simultaneously, via BACnet/IP communication
- 1.6.13 LMCP Digital Lighting Management Relay Panel – provides up to 8, 24, or 48 mechanically latching relays. Relays include a manual override and a single push-on connector for easy installation or removal from the panel. Panel accepts program changes from handheld configuration tool for date and time, location, holidays, event scheduling, button binding and group programming. Provides BACnet MS/TP-compliant digital networked communication between other lighting controls and/or building automation system (BAS)
- 1.6.14 Emergency Lighting Control Unit (ELCU) – allows a standard lighting control device to control emergency lighting in conjunction with normal lighting in any area within a building

LIGHTING CONTROL APPLICATIONS

- 1.7 Unless relevant provisions of the applicable local Energy Codes are more stringent, provide a minimum application of lighting controls as follows:
 - 1.7.1 Space Control Requirements – Provide occupancy/vacancy sensors with Manual- or Partial-ON functionality in all spaces except toilet rooms, storerooms, library stacks, or other applications where hands-free operation is desirable and Automatic-ON occupancy sensors are more appropriate. Provide Manual-ON occupancy/vacancy sensors for any enclosed office, conference room, meeting room, open plan system and training room. For spaces with multiple occupants, or where line-of-sight may be obscured, provide ceiling- or corner-mounted sensors and Manual-ON switches.
 - 1.7.2 Bi-Level Lighting – Provide multi-level controls in all spaces except toilet rooms, storerooms, library stacks, or applications where variable dimming is used
 - 1.7.3 Task Lighting / Plug Loads – Provide automatic shut off of non-essential plug loads and task lighting in all spaces except toilet rooms and storerooms. Provide Automatic-ON of plug loads whenever spaces are occupied. For spaces with multiple occupants a single shut off consistent with the overhead lighting may be used for the area
 - 1.7.4 Daylit Areas – Provide daylight-responsive automatic control in all spaces (conditioned or unconditioned) where daylight contribution is available as defined by relevant local building energy code:
 - 1.7.4.1 All luminaires within code-defined daylight zones shall be controlled separately from luminaires outside of daylit zones

- 1.7.4.2 Daytime setpoints for total ambient illumination (combined daylight and electric light) levels that initiate dimming shall be programmed in compliance with relevant local building energy codes
- 1.7.4.3 Multiple-leveled switched daylight harvesting controls may be utilized for areas marked on drawings
- 1.7.4.4 Provide smooth and continuous daylight dimming for areas marked on drawings. Daylighting control system may be designed to turn off electric lighting when daylight is at or above required lighting levels, only if system functions to turn lamps back on at dimmed level, rather than turning full-on prior to dimming.
- 1.7.5 Conference, meeting, training, auditoriums, and multipurpose rooms shall have controls that allow for independent control of each local control zone. Rooms larger than 300 square feet shall instead have at least four (4) pre-set lighting scenes unless otherwise specified. Occupancy / vacancy sensors shall be provided to extinguish all lighting in the space. Spaces with up to four moveable walls shall include controls that can be reconfigured when the room is partitioned.
- 1.8 Submit shop drawings and manufacturers' data for all components including:
 - 1.8.1 Manufacturer shall submit in bill-of-material form an itemized list of all materials supplied to meet the specification.
 - 1.8.2 Manufacturer shall submit dimensional drawings of lighting control panel(s).
 - 1.8.3 Manufacturer shall submit a point-to-point line diagram of the system configuration including all devices and accessories required to complete the system.
 - 1.8.4 Manufacturer shall submit data sheets on the components and system submitted, with descriptions of hardware and software components
 - 1.8.5 Composite wiring and/or schematic diagram of each control circuit as proposed to be installed
 - 1.8.6 Show exact location of all digital devices, including at minimum sensors, room controllers, and switches for each area on reflected ceiling plans. (Contractor must provide AutoCAD format reflected ceiling plans)
 - 1.8.7 Provide room/area details including products and sequence of operation for each room or area. Illustrate typical acceptable room/area connection topologies
 - 1.8.8 Network riser diagram including floor and building level details. Include network cable specification and end-of-line termination details, if required. Illustrate

points of connection to integrated systems. Coordinate integration with mechanical and/or other trades

QUALITY ASSURANCE

1.9 Manufacturer: Minimum 10 years' experience in manufacture of lighting controls

PROJECT CONDITIONS

1.10 Do not install equipment until following conditions can be maintained in spaces to receive equipment:

1.10.1 Ambient temperature: 0° to 40° C (32° to 104° F)

1.10.2 Relative humidity: Maximum 90 percent, non-condensing.

WARRANTY

1.11 Provide a five-year limited manufacturer's warranty on all room control devices and panels

MAINTENANCE

1.12 Spare Parts:

1.12.1 The contactor shall provide as a part of this contract additional Control modules of each type used, Switches of each type used, Daylight sensors, Ceiling mounted occupancy sensors, Wall mounted occupancy sensors, Room controller, etc, three (3) for each type. Any devices not required to be included during construction shall be delivered to the District at the completion of the project. The quantities of these devices shall be listed as a part of the Phase 1 submittals.

PART 2 – PRODUCTS

2.1 Acceptable Manufacturers: **NLight Controls to match existing system.**

Substitutions:

2.2 Bidder's wishing to obtain approval on manufacturers other than those specified in these specifications or on the drawings shall comply with the following procedures:

2.2.1 All substitution requests shall be submitted to the Architect / Engineer no less than 10 business days prior to the project bid opening date. Approvals when accepted will be issued in the form of an addendum to the contract. No consideration for substitutions will be provided after the award of the contract.

2.2.2 The substitution request must include a statement indicating how the substituted product may impact the completion of the project.

- 2.2.3 The substitution request must include a statement indicating the difference in price (both list price and Contractor price) between the specified product and the substitution.
- 2.2.4 The substitution request must include a detailed analysis indicating any differences between the specified product and the substitution.
- 2.2.5 Catalog literature for both the specified and the substitution shall be provided along with contact information of the manufacturer for the substituted product.
- 2.3 The contractor shall pay the Engineer (at their current standard hourly rates) for the time spent reviewing substitutions. These costs will be included as an addendum to be issued to all bidders to include in their proposals and must be paid to the Engineer within 60 days of award of the project.

DIGITAL LIGHTING CONTROLS

- 2.4 Furnish the Company's system which accommodates the square-footage coverage requirements for each area controlled, utilizing room controllers, digital occupancy sensors, switches, daylighting sensors and accessories which suit the lighting and electrical system parameters.

DIGITAL WALL SWITCH OCCUPANCY SENSORS

- 2.5 Wallbox mounted passive infrared PIR or dual technology (passive infrared and ultrasonic) digital occupancy sensor with 1 or 2 switch buttons
- 2.6 Digital Occupancy Sensors shall provide scrolling LCD display for digital calibration and electronic documentation. Features include the following:
 - 2.6.1 Digital calibration and pushbutton configuration for the following variables:
 - 2.6.1.1 Sensitivity – 0-100% in 10% increments
 - 2.6.1.2 Time delay – 1-30 minutes in 1 minute increments xx
 - 2.6.1.3 Test mode – Five second time delay
 - 2.6.1.4 Detection technology – PIR, Dual Technology activation and/or re-activation.
 - 2.6.1.5 Walk-through mode
 - 2.6.1.6 Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the DLM local network
 - 2.6.2 Programmable control functionality including:

- 2.6.2.1 Each sensor may be programmed to control specific loads within a local network
- 2.6.2.2 Sensor shall be capable of activating one of 16 user-definable lighting scenes.
- 2.6.2.3 Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically during the configurable period of time (default 10 seconds) after turning off.
- 2.6.2.4 On dual technology sensors, independently configurable trigger modes are available for both Normal (NH) and After Hours (AH) time periods. The retrigger mode can be programmed to use the following technologies:
 - 2.6.2.4.1 Ultrasonic and Passive Infrared
 - 2.6.2.4.2 Ultrasonic only
 - 2.6.2.4.3 Passive Infrared only
- 2.6.3 Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods
- 2.6.4 Two RJ-45 ports for connection to DLM local network
- 2.6.5 Two-way infrared (IR) transceiver to allow remote programming through handheld configuration tool and control by remote person controls.
- 2.6.6 Device Status LEDs including:
 - 2.6.6.1.1 PIR detection
 - 2.6.6.1.2 Ultrasonic detection
 - 2.6.6.1.3 Configuration mode
 - 2.6.6.1.4 Load binding
- 2.6.7 Assignment of occupancy sensor to a specific load within the room without wiring or special tools
- 2.6.8 Assignment of local buttons to specific loads within the room without wiring or special tools
- 2.6.9 Manual override of controlled loads

- 2.6.10 All digital parameter data programmed into an individual wall switch sensor shall be retained in non-volatile FLASH memory within the wall switch sensor itself. Memory shall have an expected life of no less than 10 years.
- 2.7 BACnet object information shall be available for the following objects:
 - 2.7.1 Detection state
 - 2.7.2 Occupancy sensor time delay
 - 2.7.3 Occupancy sensor sensitivity, PIR and Ultrasonic
 - 2.7.4 Button state
 - 2.7.5 Switch lock control
 - 2.7.6 Switch lock status
- 2.8 Units shall not have any dip switches or potentiometers for field settings
- 2.9 Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration will be required
- 2.10 Two-button wall switch occupancy sensors, when connected to a single relay dimming room controller, shall operate in the following sequence as a factory default:
 - 2.10.1 Left button
 - 2.10.1.1 Press and release – Turn load on
 - 2.10.1.2 Press and hold – Raise dimming load
 - 2.10.2 Right button
 - 2.10.2.1 Press and release – Turn off
 - 2.10.2.2 Press and hold – Lower diming load
- 2.11 Low voltage momentary pushbuttons shall include the following features:
 - 2.11.1 Load/Scene Status LED on each switch button with the following characteristics:
 - 2.11.1.1 Bi-level LED
 - 2.11.1.2 Dim locator level indicates power to switch
 - 2.11.1.3 Bright status level indicates that load or scene is active

2.11.2 The following button attributes may be changed or selected using a wireless configuration tool:

- 2.11.2.1 Load and Scene button function may be reconfigured for individual buttons (from Load to Scene, and vice versa).
- 2.11.2.2 Individual button function may be configured to Toggle, On only or Off only.
- 2.11.2.3 Individual scenes may be locked to prevent unauthorized change.
- 2.11.2.4 Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours.
- 2.11.2.5 Ramp rate may be adjusted for each dimmer switch.
- 2.11.2.6 Switch buttons may be bound to any load on a room controller and are not load type dependent; each button may be bound to multiple load

2.12 WattStopper part numbers: LMPW, LMDW. Available in white, light almond, ivory, grey, red and black; compatible with wall plates with decorator opening

DIGITAL WALL OR CEILING MOUNTED OCCUPANCY SENSOR

2.13 Wall or ceiling mounted (to suit installation) passive infrared (PIR), ultrasonic or dual technology digital (passive infrared and ultrasonic) occupancy sensor

2.14 Digital Occupancy Sensors shall provide graphic LCD display for digital calibration and electronic documentation. Features include the following:

2.14.1 Digital calibration and pushbutton configuration for the following variables:

- 2.14.1.1 Sensitivity – 0-100% in 10% increments
- 2.14.1.2 Time delay – 1-30 minutes in 1 minute increments
- 2.14.1.3 Test mode – Five second time delay
- 2.14.1.4 Detection technology – PIR, Ultrasonic or Dual Technology activation and/or re-activation.
- 2.14.1.5 Walk-through mode
- 2.14.1.6 Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the DLM local network.

- 2.14.2 Programmable control functionality including:
 - 2.14.2.1 Each sensor may be programmed to control specific loads within a local network.
 - 2.14.2.2 Sensor shall be capable of activating one of 16 user-definable lighting scenes.
 - 2.14.2.3 Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically within a configurable period of time (default 10 seconds) after turning off
 - 2.14.2.4 On dual technology sensors, independently configurable trigger modes are available for both Normal (NH) and After Hours (AH) time periods. The retrigger mode can be programmed to use the following technologies:
 - 2.14.2.4.1 Ultrasonic and Passive Infrared
 - 2.14.2.4.2 Ultrasonic or Passive Infrared
 - 2.14.2.4.3 Ultrasonic only
 - 2.14.2.4.4 Passive Infrared only
- 2.14.3 Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods.
- 2.14.4 One or two RJ-45 port(s) for connection to DLM local network
- 2.14.5 Two-way infrared (IR) transceiver to allow remote programming through handheld commissioning tool and control by remote personal controls
- 2.14.6 Device Status LEDs, which may be disabled for selected applications, including:
 - 2.14.6.1 PIR detection
 - 2.14.6.2 Ultrasonic detection
 - 2.14.6.3 Configuration mode
 - 2.14.6.4 Load binding
- 2.14.7 Assignment of occupancy sensor to a specific load within the room without wiring or special tools
- 2.14.8 Manual override of controlled loads

- 2.14.9 All digital parameter data programmed into an individual occupancy sensor shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years
- 2.15 BACnet object information shall be available for the following objects:
 - 2.15.1 Detection state
 - 2.15.2 Occupancy sensor time delay
 - 2.15.3 Occupancy sensor sensitivity, PIR and Ultrasonic
- 2.16 Units shall not have any dip switches or potentiometers for field settings
- 2.17 Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration will be required.
- 2.18 WattStopper product numbers: LMPX, LMDX, LMPC, LMUC, LMDC

DIGITAL WALL SWITCHES

- 2.19 Low voltage momentary pushbutton switches in 1, 2, 3, 4, 5 and 8 button configurations. Wall switches shall include the following features:
 - 2.19.1 Two-way infrared (IR) transceiver for use with personal and configuration remote controls.
 - 2.19.2 Removable buttons for field replacement with engraved buttons and/or alternate color buttons. Button replacement may be completed without removing the switch from the wall.
 - 2.19.3 Configuration LED on each switch that blinks to indicate data transmission.
 - 2.19.4 Load/Scene Status LED on each switch button with the following characteristics:
 - 2.19.4.1 Bi-level LED
 - 2.19.4.2 Dim locator level indicates power to switch
 - 2.19.4.3 Bright status level indicates that load or scene is active
 - 2.19.5 Dimming switches shall include seven bi-level LEDs to indicate load levels using 14 steps
 - 2.19.6 Programmable control functionality including
 - 2.19.6.1 Button priority may be configured to any BACnet priority level, from 1-16, corresponding to networked operation allowing local actions to utilize life safety priority.

- 2.19.6.2 Scene patterns may be saved to any button other than dimming rockers. Once set, buttons may be digitally locked to prevent overwriting of the preset levels
- 2.19.7 All digital parameter data programmed into an individual wall switch shall be retained in non-volatile FLASH memory within the wall switch itself. Memory shall have an expected life of no less than 10 years
- 2.20 BACnet object information shall be available for the following objects:
 - 2.20.1 Button state
 - 2.20.2 Switch lock control
 - 2.20.3 Switch lock status
- 2.21 Two RJ-45 ports for connection to DLM local network
- 2.22 Multiple digital wall switches may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration shall be required to achieve multi-way switching
- 2.23 The following switch attributes may be changed or selected using a wireless configuration tool:
 - 2.23.1 Load and Scene button function may be reconfigured for individual buttons (from Load to Scene, and vice versa)
 - 2.23.2 Individual button function may be configured to Toggle, On only or Off only.
 - 2.23.3 Individual scenes may be locked to prevent unauthorized change.
 - 2.23.4 Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours
 - 2.23.5 Ramp rate may be adjusted for each dimmer switch.
 - 2.23.6 Switch buttons may be bound to any load on a room controller and are not load type dependent; each button may be bound to multiple loads
- 2.24 WattStopper product numbers: LMSW-101, LMSW-102, LMSW-103, LMSW-104, LMSW-105, LMSW-108, LMDM-101. Available in white, light almond, ivory, grey, red and black; compatible with wall plates with decorator opening

HANDHELD REMOTE CONTROLS

- 2.25 Battery-operated handheld devices in 1, 2 and 5 button configurations for remote switching or dimming control. Remote controls shall include the following features:

- 2.25.1 Two-way infrared (IR) transceiver for line of sight communication with DLM local network within up to 30 feet
- 2.25.2 LED on each button confirms button press
- 2.25.3 Load buttons may be bound to any load on a room controller and are not load type dependent; each button may be bound to multiple loads
- 2.25.4 Inactivity timeout to save battery life
- 2.26 A wall mount holster and mounting hardware shall be included with each remote control
- 2.27 WattStopper part numbers: LMRH-101, LMRH-102, LMRH-105

DIGITAL PARTITION CONTROLS

- 2.28 Partition controls shall enable manual or automatic coordination of lighting controls in flexible spaces with up to four moveable walls by reconfiguring the connected digital switches and occupancy sensors
- 2.29 Four-button low voltage pushbutton switch for manual control.
 - 2.29.1 Two-way infrared (IR) transceiver for use with configuration remote control.
 - 2.29.2 Removable buttons for field replacement with engraved buttons and/or alternate color buttons. Button replacement may be completed without removing the switch from the wall
 - 2.29.3 Configuration LED on each switch that blinks to indicate data transmission.
 - 2.29.4 Each button represents one wall; Green button LED indicates status.
 - 2.29.5 Two RJ-45 ports for connection to DLM local network.
- 2.30 WattStopper part number: LMPS-104. Available in white, light almond, ivory, grey and black; compatible with wall plates with decorator opening
- 2.31 Contact closure interface for automatic control via input from limit switches on movable walls (by others).
 - 2.31.1 Operates on Class 2 power supplied by DLM local network.
 - 2.31.2 Includes 24VDC output and four input terminals for maintained third party contact closure inputs.
 - 2.31.2.1 Input max. sink/source current: 1-5Ma
 - 2.31.2.2 Logic input signal voltage High: >18VDC

2.31.2.3 Logic input signal voltage Low: <2VDC

2.31.3 Four status LEDs under hinged cover indicate if walls are open or closed; supports LMPS-104 as remote status indicator.

2.31.4 Two RJ-45 ports for connection to DLM local network.

2.32 WattStopper part number: LMIO-102

DIGITAL DAYLIGHTING SENSORS

2.33 Digital daylighting sensors shall work with room controllers to provide automatic switching, bi-level, or tri-level or dimming daylight harvesting capabilities for any load type connected to a room controller. Daylighting sensors shall be interchangeable without the need for rewiring

2.33.1 Closed loop sensors measure the ambient light in the space and control a single lighting zone

2.33.2 Open loop sensors measure incoming daylight in the space, and are capable of controlling up to three lighting zones

2.33.3 Dual loop sensors measure both ambient and incoming daylight in the space to insure that proper light levels are maintained as changes to reflective materials are made in a single zone

2.34 Digital daylighting sensors shall include the following features:

2.34.1 The sensor's internal photodiode shall only measure lightwaves within the visible spectrum. The photodiode's spectral response curve shall closely match the entire photopic curve. The photodiode shall not measure energy in either the ultraviolet or infrared spectrums. The photocell shall have a sensitivity of less than 5% for any wavelengths less than 400 nanometers or greater than 700 nanometers

2.34.2 Sensor light level range shall be from 1-6,553 footcandles (fc).

2.34.3 The capability of ON/OFF, bi-level or tri-level switching, or dimming, for each controlled zone, depending on the selection of room controller(s) and load binding to room controller(s).

2.34.4 For switching daylight harvesting, the photosensor shall provide a field-selectable deadband, or a separation, between the "ON Setpoint" and the "OFF Setpoint" that will prevent the lights from cycling excessively after they turn off.

2.34.5 For dimming daylight harvesting, the photosensor shall provide the option, when the daylight contribution is sufficient, of turning lights off or dimming lights to a field-selectable minimum level

- 2.34.6 Photosensors shall have a digital, independently configurable fade rate for both increasing and decreasing light level in units of percent per second.
- 2.34.7 Photosensors shall provide adjustable cut-off time. Cut-off time is defined by the number of selected minutes the load is at the minimum output before the load turns off. Selectable range between 0-240 minutes including option to never cut-off
- 2.34.8 Optional wall switch override shall allow occupants to reduce lighting level to increase energy savings or, if permitted by system administrator, raise lighting levels for a selectable period of time or cycle of occupancy
- 2.34.9 Integral infrared (IR) transceiver for configuration and/or commissioning with a handheld configuration tool, to transmit detected light level to wireless configuration tool, and for communication with personal remote controls
- 2.34.10 Configuration LED status light on device that blinks to indicate data transmission
- 2.34.11 Status LED indicates test mode, override mode and load binding.
- 2.34.12 Recessed switch on device to turn controlled load(s) ON and OFF.
- 2.34.13 BACnet object information shall be available for the following daylighting sensor objects, based on the specific photocell's settings:
 - 2.34.13.1 Day and night setpoints
 - 2.34.13.2 Off time delay
 - 2.34.13.3 On and off setpoints
 - 2.34.13.4 Up top three setpoints
 - 2.34.13.5 Operating mode – on/off, bi-level, tri-level or dimming
- 2.34.14 One RJ-45 port for connection to DLM local network

2.35 A choice of accessories to accommodate multiple mounting methods and building materials. The photosensors may be mounted on a ceiling tile, skylight light well, suspended lighting fixture or backbox. Standard tube photosensors accommodate mounting materials from 0-0.62" thickness (LMLS-400, LMLS-500). Extended tube photosensors accommodate mounting materials from 0.62"-1.25" thickness (LMLS-400-L, LMLS-500-L). Mounting brackets are compatible with J boxes (LMLS-MB1) and wall mounting (LMLS-MB2). LMLS-600 photosensor to be mounted on included bracket below skylight well

2.36 Any load or group of load in the room can be assigned to a daylighting zone

- 2.37 Each load within a daylighting zone can be individually enabled or disabled for discrete control) load independence)
- 2.38 All digital parameter data programmed into a photosensor shall be retained in non-volatile FLASH memory within the photosensor itself. Memory shall have an expected life of no less than 10 years

Closed loop digital photosensors shall include the following additional features:

- 2.39 An internal photodiode that measures light in a 100-degree angle, cutting off the unwanted light from bright sources outside of this cone.
- 2.40 Automatic self-calibration, initiated from the photosensor, a wireless configuration tool or a PC with appropriate software
- 2.41 Automatically establishes application-specific setpoints following self-calibration. For switching operation, an adequate deadband between the ON and OFF setpoints shall prevent the lights from cycling; for dimming operation a sliding setpoint control algorithm with separate Day and Night setpoints shall prevent abrupt ramping of loads
- 2.42 WattStopper Product Number: LMLS-400, LMLS-400-L

Open loop digital photosensors shall include the following additional features:

- 2.43 An internal photodiode that measures light in a 60-degree angle cutting off the unwanted light from the interior of the room
- 2.44 Automatically establishes application-specific setpoints following manual calibration using a wireless configuration tool or a PC with appropriate software. For switching operation, an adequate deadband between the ON and OFF setpoints for each zone shall prevent the lights from cycling; for dimming operation, a proportional control algorithm shall maintain the design lighting level in each zone
- 2.45 Each of the three discrete daylight zones can include any non-overlapping group of loads in the room
- 2.46 WattStopper Product Number: LMLS-500, LMLS-500-L

Dual loop photosensors shall include the following additional features:

- 2.47 Close loop portion of dual loop device must have an internal photodiode that measures light in a 100 degree angle, cutting off the unwanted light from sources outside.
- 2.48 Open loop portion of dual loop device must have an internal photodiode that can measure light in a 60 degree angle, cutting off the unwanted light from the interior of the room
- 2.49 Automatically establishes application-specific set-points following self-calibration. For switching operation, an adequate deadband between the ON and OFF setpoints shall

prevent the lights from cycling; for dimming operation a sliding setpoint control algorithm with separate Day and Night setpoints shall prevent abrupt ramping of load

- 2.50 Device must reference closed loop photosensor information as a base line reference. The device must be able to analyze the open loop photosensor information to determine if an adjustment in light levels is require
- 2.51 Device must be able to automatically commission setpoints each night to provide adjustments to electrical lighting based on changes in overall lighting in the space due to changes in reflectance within the space or changes to daylight contribution based on seasonal changes
- 2.52 Device must include extendable mounting arm to properly position sensor within a skylight well
- 2.53 WattStopper product number LMLS-600

DIGITAL ROOM CONTROLLERS AND PLUG – LOAD CONTROLLERS

- 2.54 Digital controllers for lighting and plug loads automatically bind the room loads to the connected devices in the space without commissioning or the use of any tools. Room and plug load controllers shall be provided to match the room lighting and plug load control requirements. The controllers will be simple to install, and will not have dip switches or potentiometers, or require special configuration for standard Plug n’ Go applications. The control units will include the following features:
 - 2.54.1 Automatic room configuration to the most energy-efficient sequence of operation based upon the devices in the room
 - 2.54.2 Simple replacement – Using the default automatic configuration capabilities, a room controller may be replaced with an off-the-shelf
 - 2.54.3 Multiple room controllers connected together in a local network must automatically prioritize each room controller, without requiring any configuration or setup, so that loads are sequentially assigned using room controller device ID’s from highest to lowest
 - 2.54.4 Device Status LEDs to indicate:
 - 2.54.4.1 Data transmission
 - 2.54.4.2 Device has power
 - 2.54.4.3 Status for each load
 - 2.54.4.4 Configuration status
 - 2.54.5 Quick installation features including:

- 2.54.5.1 Standard junction box mounting
- 2.54.5.2 Quick low voltage connections using standard RJ-45 patch cable
- 2.54.6 Based on individual configuration, each load shall be capable of the following behavior on power up following the loss of normal power
 - 2.54.6.1 Turn on to 100%
 - 2.54.6.2 Remain off
 - 2.54.6.3 Turn on to last level
- 2.54.7 Each load shall be configurable to operate in the following sequences based on occupancy:
 - 2.54.7.1 Auto-on/Auto-off (Follow on and off)
 - 2.54.7.2 Manual-on/Auto-off (Follow off only)
- 2.54.8 The priority of each load output shall be reversible, via digital configuration, so that on is off and off is on
- 2.54.9 BACnet object information shall be available for the following objects:
 - 2.54.9.1 Load status
 - 2.54.9.2 Electrical current
 - 2.54.9.3 Total watts per controller
 - 2.54.9.4 Schedule state – normal or after-hours
 - 2.54.9.5 Demand response control and cap level
 - 2.54.9.6 Room occupancy status
 - 2.54.9.7 Total room lighting and plug loads watts
 - 2.54.9.8 Total room watts/sq ft
 - 2.54.9.9 Force on/off all loads
- 2.54.10 UL 2043 plenum rated
- 2.54.11 Manual override and LED indication for each load
- 2.54.12 Dual voltage (120/277 VAC, 60 Hz), or 347 VAC, 60 Hz (selected models only).
120/277 volt models rated for 20A total load, derating to 16A required for some

dimmed loads (forward phase dimming); 347 volt models rated for 15A total load; plug load controllers carry application-specific UL 20 rating for receptacle control.

2.54.13 Zero cross circuitry each load

2.54.14 All digital parameter data programmed into an individual room controller or plug load controller shall be retained in non-volatile FLASH memory within the controller itself. Memory shall have an expected life of no less than 10 years.

2.55 On/Off Controllers shall include:

2.55.1 One or two relay configuration

2.55.2 Efficient 150 mA switching power supply

2.55.3 Three RJ-45 DLM local network ports with integral strain relief and dust cover

2.55.4 WattStopper product numbers: LMRC-101, LMRC-102

2.56 On/Off/Dimming enhanced Room Controllers shall include:

2.56.1 Real time current monitoring

2.56.2 Multiple relay configurations

2.56.2.1 One, two or three relays (LMRC-21 x series)

2.56.2.2 One or two relays (LMRC-22x series)

2.56.3 Efficient 250 mA switching power supply

2.56.4 Four RJ-45 DLM local network ports with integral strain relief and dust cover

2.56.5 Once dimming output per relay

2.56.5.1 0-10V Dimming - Where indicated, one 0-10 volt analog output per relay for control of compatible ballasts and LED drivers. The 0-10 volt output shall automatically open upon loss of power to the Room Controller to assure full light output from the controlled lighting. (LMRC-21x series)

2.56.5.2 Line Voltage, Forward Phase Dimming - Where indicated, one forward phase control line voltage dimming output per relay for control of compatible two-wire or three-wire ballasts, LED drivers, MLV, forward phase compatible ELV, neon/cold cathode and incandescent loads. (LMRC-22x series)

- 2.56.5.3 Each dimming output channel shall have an independently configurable minimum and maximum calibration trim level to set the dimming range to match the true dynamic range of the connected ballast or driver
- 2.56.5.4 The LED level indicators on bound dimming switches shall utilize this new maximum and minimum trim
- 2.56.5.5 Each dimming output channel shall have an independently configurable minimum and maximum trim level to set the dynamic range of the output within the new 0-100% dimming range defined by the minimum and maximum calibration trim
- 2.56.5.6 Calibration and trim levels must be set per output channel
- 2.56.5.7 Devices that set calibration or trim levels per controller are not acceptable
- 2.56.5.8 All configuration shall be digital. Devices that set calibration or trim levels per output channel via trim pots or dip-switches are not acceptable
- 2.56.6 Each load shall have an independently configurable preset on level for Normal Hours and After Hours events to allow different dimmed levels to be established at the start of both Normal Hours and After Hours events
- 2.56.7 Fade rates for dimming loads shall be specific to bound switch buttons, and the load shall maintain a default value for any bound buttons that do not specify a unique value
- 2.56.8 The following dimming attributes may be changed or selected using a wireless configuration tool:
 - 2.56.8.1 Establish preset level for each load from 0-100%
 - 2.56.8.2 Set high and low trim for each load
 - 2.56.8.3 Set lamp burn in time for each load up to 100 hours
- 2.56.9 Override button for each load provides the following functions:
 - 2.56.9.1 Press and release for on/off control
 - 2.56.9.2 Press and hold for dimming control
- 2.57 WattStopper product numbers: LMRC-211, LRMC-212, LMRC-221, LMRC-222
- 2.58 Plug Load Room Controllers shall include the following:

- 2.58.1 One relay configuration with additional connection for unswitched load
- 2.58.2 Configurable additive time delay to extend plug load time delay beyond occupancy sensor time delay (e.g. a 10 minute additive delay in a space with a 20 minute occupancy sensor delay ensures that plug loads turn off 30 minutes after the space is vacated)
- 2.58.3 Factory default operation is Auto-on/Auto-off, based on occupancy
- 2.58.4 Real time current monitoring of both switched and un-switched load (LMPL-201 only)
- 2.58.5 Efficient switching power supply
 - 2.58.5.1 150mA (LMPL-101)
 - 2.58.5.2 250mA (LMPL-201)
- 2.58.6 RJ-45 DLM local network ports
 - 2.58.6.1 Three RJ-45 ports (LMPL-101)
 - 2.58.6.2 Four RJ-45 ports (LMPL-201)

2.59 Wattstopper product numbers: LMPL-101, LMPL-201

DLM LOCAL NETWORK (Room Network)

- 2.60 The DLM local network is a free topology lighting control physical connection and communication protocol designed to control a small area of a building
- 2.61 Features of the DLM local network include:
 - 2.61.1 Plug n’ Go® automatic configuration and binding of occupancy sensors, switches and lighting loads to the most energy-efficient sequence of operation based upon the device attached
 - 2.61.2 Simple replacement of any device in the network with a standard off the shelf unit without requiring commissioning, configuration or setup
 - 2.61.3 Push n’ Learn® configuration to change the automatic configuration, including binding and load parameters without tools, using only the buttons on the digital devices in the local network
 - 2.61.4 Two-way infrared communications for control by handheld remotes, and configuration by a handheld tool including adjusting load parameters, sensor configuration and binding, within a line of sight of up to 30 feet from a sensor, wall switch or IR receiver

- 2.62 Digital room devices connect to the local network using pre-terminated Cat 5e cables with RJ-45 connectors, which provide both data and power to room devices. Systems that utilize RJ-45 patch cords but do not provide serial communication data from individual end devices are not acceptable
- 2.63 If manufacturer's pre-terminated Cat 5e cables are not used for the installation, the contractor is responsible for testing each cable following installation and supplying manufacturer with test results
- 2.64 WattStopper Product Number: LMRJ-Series

DLM SEGMENT NETWORK (Room to Room Network)

- 2.65 The segment network shall be a linear topology, BACnet-based MS/TP subnet to connect DLM local networks (rooms) and LMCP relay panels for centralized control
 - 2.65.1 Each connected DLM local network shall include a single network bridge (LMBC-300), and the network bridge is the only room-based device that is connected to the segment network
 - 2.65.2 Network bridges, relay panels and segment managers shall include terminal blocks, with provisions for separate "in" and "out" terminations, for segment network connections
 - 2.65.3 The segment network shall utilize 1.5 twisted pair, shielded, cable supplied by the lighting control manufacturer. The maximum cable run for each segment is 4,000 feet. Conductor-to-conductor capacitance of the twisted pair shall be less than 30 pf/ft and have a characteristic impedance of 120 Ohms
 - 2.65.4 Network signal integrity requires that each conductor and ground wire be correctly terminated at every connected device
 - 2.65.5 Substitution of manufacturer-supplied cable must be pre-approved: Manufacturer will not certify network reliability, and reserves the right to void warranty, if non-approved cable is installed, and if terminations are not completed according to manufacturer's specific requirements
 - 2.65.6 Segment networks shall be capable of connecting to BACnet-compliant BAS (provided by others) either directly, via MS/TP, or through NB-ROUTERS, via BACnet/IP or BACnet/Ethernet. Systems whose room-connected network infrastructure require gateway devices to provide BACnet data to a BAS are unacceptable
- 2.66 WattStopper Product Number: LM-MSTP, LM-MSTP-DB

CONFIGURATION TOOLS

- 2.67 A wireless configuration tool facilitates optional customization of DLM local networks using two-way infrared communications, while PC software connects to each local network via a USB interface
- 2.68 Features and functionality of the wireless configuration tool shall include but not be limited to:
 - 2.68.1 Two-way infrared (IR) communication with DLM IR-enabled devices within a range of approximately 30 feet
 - 2.68.2 High visibility organic LED (OLED) display, pushbutton user interface and menu-driven operation
 - 2.68.3 Must be able to read and modify parameters for room controllers, occupancy sensors, wall switches, daylighting sensors, network bridges and relay panels, and identify room devices by type and serial number
 - 2.68.4 Save up to eight occupancy sensor setting profiles, and apply profiles to selected sensors
 - 2.68.5 Temporarily adjust light level of any load(s) on the local network, and incorporate those levels in scene setting. Set room mode for testing of Normal Hours (NH) and After Hours (AH) parameter settings
 - 2.68.6 Adjust or fine-tune daylighting settings established during auto-configuration, and input light level data to complete configuration of open loop daylighting controls
 - 2.68.7 Set room mode for testing of Normal Hours (NH) and After Hours (AH) parameter settings
 - 2.68.8 Verify status of building level network devices
- 2.69 WattStopper Product Numbers: LMCT-100, LMCI-100/LMCS-100

NETWORK BRIDGE

- 2.70 The network bridge module connects a DLM local network to a BACnet-compliant segment network for communication between rooms, relay panels and a segment manager or BAS. Each local network shall include a network bridge component to provide a connection to the local network room devices. The network bridge shall use industry standard BACnet MS/TP network communication and an optically isolated EIA/TIA RS-485 transceiver
 - 2.70.1 The network bridge shall be provided as a separate module connected on the local network through an available RJ-45 port
 - 2.70.2 Provide Plug n' Go operation to automatically discover room devices connected to the local network and make all device parameters visible to the segment

manager via the segment network. No commissioning shall be required for set up of the network bridge on the local network

2.70.3 The network bridge shall automatically create standard BACnet objects for selected room device parameters to allow any BACnet-compliant BAS to include lighting control and power monitoring features as provided by the DLM room devices on each local network. BACnet objects will be created for the addition or replacement of any given in-room DLM device for the installed life of the system. Products requiring that an application-specific point database be loaded to create or map BACnet objects are not acceptable. Systems not capable of providing BACnet data for control devices via a dedicated BACnet Device ID and physical MS/TP termination per room are not acceptable. Standard BACnet objects shall be provided as follows:

- 2.70.3.1 Read/write the normal or after hours schedule state for the room
- 2.70.3.2 Read the detection state of each occupancy sensor
- 2.70.3.3 Read the aggregate occupancy state of the room
- 2.70.3.4 Read/write the On/Off state of loads
- 2.70.3.5 Read/write the dimmed light level of loads
- 2.70.3.6 Read the button states of switches
- 2.70.3.7 Read total current in amps, and total power in watts through the room control
- 2.70.3.8 Read/write occupancy sensor time delay, PIR sensitivity and ultrasonic sensitivity settings
- 2.70.3.9 Activate a preset scene for the room
- 2.70.3.10 Read/write daylight sensor fade time and day and night setpoints
- 2.70.3.11 Read the current light level, in footcandles, from interior and exterior photosensors and photocells
- 2.70.3.12 Set daylight sensor operating mode
- 2.70.3.13 Read/write wall switch lock status
- 2.70.3.14 Read watts per square foot for the entire controlled room
- 2.70.3.15 Write maximum light level per load for demand response mode

2.70.3.16 Read/write activation of demand response mode for the room

2.70.3.17 Activate/restore demand response mode for the room

2.71 Wattstopper product number: LMBC-300

SEGMENT MANAGER

2.72 For networked applications, the Digital Lighting Management system shall include at least one segment manager to manage network communication. It shall be capable of serving up a graphical user interface via a standard web browser utilizing either unencrypted TCP/IP traffic via a configurable port (default is 80) or 256 bit AES encrypted SSL TCP/IP traffic via a configurable port (default is 443)

2.73 Each segment manager shall have integral support for at least three segment networks. Segment networks may alternately be connected to the segment manger via external routers and switches, using standard Ethernet structured wiring. Each router shall accommodate one segment network. Provide the quantity of routers and switches as shown on the plans

2.74 Operational features of the Segment Manager shall include the following:

2.74.1 Connection to PC or LAN via standard Ethernet TCP/IP via standard Ethernet TCP/IP with the option to use SSL encrypted connections for all traffic

2.74.2 Easy to learn and use graphical user interface, compatible with Internet Explorer 8, or equal browser. Shall not require installation of any lighting control software to an end-user PC

2.74.3 Log in security capable of restricting some users to view-only or other limited operations

2.74.4 Automatic discovery of DLM devices and relay panels on the segment network(s). Commissioning beyond activation of the discovery function shall not be required to provide communication, monitoring or control of all local networks and lighting control panels

2.74.5 After discovery, all rooms and panels shall be presented in a standard navigation tree format. Selecting a device from the tree will allow the device settings and operational parameters to be viewed and changed by the use

2.74.6 Ability to view and modify room device operational parameters. It shall be possible to set device parameters independently for normal hours and after hours operation including sensor time delays and sensitivities, and load response to sensor including Manual-On or Auto-On

2.74.7 Ability to set up schedules for rooms and panels, view and override current status of panel channels and relays and assign relays to groups. Schedules shall

automatically set controlled zones or areas to either a normal hour or after hours mode of operation. Support for a minimum of 100 unique schedules, each with up to four-time events per day. Support for annual schedules, holiday schedules and unique date-bound schedules

2.74.8 Ability to group rooms and loads for common control by schedules, switches or network commands

2.74.9 Ability to monitor connected load current and display power consumption for areas equipped with room controllers incorporating the integral current monitoring feature

2.74.10 Provide capabilities for integration with a BAS via BACnet protocol. At a minimum, the following points shall be available to the BAS via BACnet IP connection to the segment manager: room occupancy state; room schedule mode; room switch lock control; individual occupancy sensor state; room lighting power; room plug-load power; load ON/OFF state; load dimming level; panel channel schedule state; panel relay state; and Segment Manager Group schedule state control

2.74.11 The Segment Manager shall allow access and control of the overall system database via Native Niagara AX FOX connectivity. Systems that must utilize a Tridium Niagara controller in addition to the programming, scheduling and configuration server are not acceptable

2.75 Segment Manager shall support multiple DLM rooms as follows

2.75.1 Support up to 120 network bridges and 900 digital in-room devices (LMSM-3E)

2.75.2 Support up to 300 network bridges and 2,200 digital in room devices, connected via network routers and switches (LMSM-6E)

2.76 WattStopper Product Numbers: LMSM-3E, LMSM-6E, NB-ROUTER, NB-SWITCH, NB-SWITCH-8, NB-SWITCH-16

PROGRAMMING, CONFIGURARION AND DOCUMENTATION SOFTWARE

2.77 PC-native application for optional programming of detailed technician-level parameter information for all DLM products, including all parameters not accessible via BACnet and the handled IR configuration tool. Software must be capable of accessing room-level parameter information locally within the room when connected via the optional LMCI-100 USB programming adapter, or globally for many segment networks simultaneously utilizing standard BACnet/IP communication. Additional parameters exposed through this method include but are not limited to:

2.77.1 Occupancy sensor detection LED disable for performance and other aesthetic spaces where blinking LEDs present a distraction.

- 2.77.2 Six occupancy sensor action behaviors for each controlled load, separately configurable for normal hours and after hours modes. Modes include: No Action, Follow Off Only, Follow On Only, Follow On and Off, Follow On Only with Override Time Delay, Follow Off Only with Blink Warn Grace Time, Follow On and Off with Blink Warn Grace Time.
 - 2.77.3 Separate fade time adjustments per load for both normal and after hours from 0 - 4 hours.
 - 2.77.4 Configurable occupancy sensor re-trigger grace period from 0 - 4 minutes separate for both normal hours and after hours.
 - 2.77.5 Separate normal hours and after hours per-load button mode with modes including: Do nothing, on only, off only, on and off.
 - 2.77.6 Load control polarity reversal so that on events turn loads off and vice versa.
 - 2.77.7 Per-load DR (demand response) shed level in units of percent.
 - 2.77.8 Load output pulse mode in increments of 1second.
 - 2.77.9 Fade trip point for each load for normal hours and after hours that establishes the dimmer command level at which a switched load closes its relay to allow for staggered On of switched loads in response to a dimmer
- 2.78 Generation of reports at the whole file, partial file, or room level. Reports include but are not limited to:
- 2.78.1 Device list report: All devices in a project listed by type.
 - 2.78.2 Load binding report: All load controller bindings showing interaction with sensors, switches, and daylighting.
 - 2.78.3 BACnet points report: Per room Device ID report of the valid BACnet points for a given site's BOM.
 - 2.78.4 Room summary report: Device manifest for each room, aggregated by common BOM, showing basic sequence of operations.
 - 2.78.5 Device parameter report: Per-room lists of all configured parameters accessible via hand held IR programmer for use with O&M documentation.
 - 2.78.6 Scene report: All project scene pattern values not left at defaults (i.e. 1 = all loads 100%, 2 = all loads 75%, 3 = all loads 50%, 4 = all loads 25%, 5-16 = same as scene 1).
 - 2.78.7 Occupancy sensor report: Basic settings including time delay and sensitivity(ies) for all occupancy sensors

- 2.79 Network-wide programming of parameter data in a spreadsheet-like programming environment including but not limited to the following operations
 - 2.79.1 Set, copy/paste an entire project site of sensor time delays.
 - 2.79.2 Set, copy/paste an entire project site of sensor sensitivity settings.
 - 2.79.3 Search based on room name and text labels.
 - 2.79.4 Filter by product type (i.e. LMRC-212) to allow parameter set by product.
 - 2.79.5 Filter by parameter value to search for product with specific configurations
- 2.80 Network-wide firmware upgrading remotely via the BACnet/IP network
 - 2.80.1 Mass firmware update of entire rooms
 - 2.80.2 Mass firmware update of specifically selected rooms or areas
 - 2.80.3 Mass firmware upgrade of specific products
- 2.81 WattStopper Product Number: LMCS-100, LMCI-100

LMCP LIGHTING CONTROL PANELS

- 2.82 Provide lighting control panels in the locations and capacities as indicated on the plans and schedules. Each panel shall be of modular construction and consist of the following components:
 - 2.82.1 Enclosure/Tub shall be NEMA 1, sized to accept an interior with 1 - 8 relays, 1 - 24 relays and 6 four-pole contactors, or 1 - 48 relays and 6 four-pole contactors
 - 2.82.2 Cover shall be configured for surface or flush wall mounting of the panel as indicated on the plans. The panel cover shall have a hinged and lockable door with restricted access to line voltage section of the panel
 - 2.82.3 Interior assembly shall be supplied as a factory assembled component specifically designed and listed for field installation. The interior construction shall provide total isolation of high voltage (Class 1) wiring from low voltage (Class 2) wiring within the assembled panel. The interior assembly shall include intelligence boards, power supply, DIN rails for mounting optional Class 2 control devices, and individually replaceable latching type relays. The panel interiors shall include the following features
 - 2.82.3.1 Removable, plug-in terminal blocks with connections for all low voltage terminations
 - 2.82.3.2 Individual terminal block, override pushbutton, and LED status light for each relay

- 2.82.3.3 Direct wired switch inputs associated with each relay shall support 2-wire momentary switches only
- 2.82.3.4 Digital inputs (four RJ-45 jacks) shall support 1-, 2-, 3-, 4-, and 8-button digital switches; digital IO modules capable of receiving 0-5V or 0-10V analog photocell inputs; digital IO modules capable of receiving momentary or maintained contact closure inputs or analog sensor inputs; digital daylighting sensors; and digital occupancy sensors. Inputs are divided into two separate digital networks, each capable of supplying 250mA to connected devices
- 2.82.3.5 True relay state shall be indicated by the on-board LED and shall be available to external control devices and systems via BACnet
- 2.82.3.6 Automatically sequenced operation of relays to reduce impact on the electrical distribution system when large loads are controlled simultaneously
- 2.82.3.7 Group and pattern control of relays shall be provided through a simple keypad interface from a handheld IR programmer. Any set of relays can be associated with a group for direct on/off control or pattern (scene) control via a simple programming sequence using the relay override pushbuttons and LED displays for groups 1-8 or a handheld IR programmer for groups 1-99
- 2.82.3.8 Relay group status for shall be provided through LED indicators for groups 1-8 and via BACnet for groups 1-99. A solid LED indicates that the last group action called for an ON state and relays in the group are on or in a mixed state
- 2.82.3.9 Single-pole latching relays with modular plug-in design. Relays shall provide the following ratings and features:

Electrical

- 2.82.3.9.1 30 amp ballast at 277V
- 2.82.3.9.2 20 amp ballast at 347V
- 2.82.3.9.3 20 amp tungsten at 120V
- 2.82.3.9.4 30 amp resistive at 347V
- 2.82.3.9.5 1.5 HP motor at 120V
- 2.82.3.9.6 14,000 amp short circuit current rating (SCCR) at 347V

- 2.82.3.9.7 Relays shall be specifically UL 20 listed for control of plug-loads
- Mechanical
- 2.82.3.9.8 Replaceable, ½" KO mounting with removable Class 2 wire harness
- 2.82.3.9.9 Actuator on relay housing provides manual override and visual status indication, accessible from Class 2 section of panel
- 2.82.3.9.10 Dual line and load terminals each support two #14 - #12 solid or stranded conductors
- 2.82.3.9.11 Tested to 300,000 mechanical on/off cycles
- 2.83 Isolated low voltage contacts provide for true relay status feedback and pilot light indication
- 2.84 Power supply shall be a multi-voltage transformer assembly with rated power to supply all electronics, occupancy sensors, switches, pilot lights, and photocells as necessary to meet the project requirements. Power supply to have internal over-current protection with automatic reset and metal oxide varistor protection
- 2.85 Where indicated, lighting control panels designated for control of emergency lighting shall be provided with factory installed provision for automatic by pass of relays controlling emergency circuits upon loss of normal power. Panels shall be properly listed and labeled for use on emergency lighting circuits and shall meet the requirements of UL924 and NFPA 70 - Article 700
- 2.86 Integral system clock shall provide scheduling capabilities for panel-only projects without DLM segment networks or BAS control
 - 2.86.1 Each panel shall include digital clock capability able to issue system wide automation commands to up to (11) eleven other panels for a total of (12) twelve networked lighting control panels. The clock shall provide capability for up to 254 independent schedule events per panel for each of the ninety-nine system wide channel groups
 - 2.86.2 The clock capability of each panel shall support the time-based energy saving requirements of applicable local energy codes
 - 2.86.3 The clock module shall provide astronomic capabilities, time delays, blink warning, daylight savings, and holiday functions and will include a battery back up for the clock function and program retention in non-volatile FLASH memory. Clocks that require multiple events to meet local code lighting shut off requirements shall not be allowed

- 2.86.4 The clock capability of each panel shall operate on a basis of ON/OFF or Normal Hours/After Hours messages to automation groups that implement pre-configured control scenarios. Scenarios shall include:
 - 2.86.4.1 Scheduled ON / OFF
 - 2.86.4.2 Manual ON / Scheduled OFF
 - 2.86.4.3 Astro ON / OFF (or Photo ON / OFF)
 - 2.86.4.4 Astro and Schedule ON / OFF (or Photo and Schedule ON / OFF)
- 2.86.5 The user interface shall be a portable IR handheld remote control capable of programming any panel in the system (LMCT-100)
- 2.86.6 The clock capability of each panel shall employ non-volatile memory and shall retain user programming and time for a minimum of 10 years
- 2.86.7 Schedules programmed into the clock of any one panel shall be capable of executing panel local schedule or Dark/Light (photocell or Astro) events for that panel in the event that global network communication is lost. Lighting control panels that are not capable of executing events independently of the global network shall not be acceptable
- 2.87 The lighting control panel can operate as a stand-alone system, or can support schedule, group, and photocell control functions, as configured in a Segment Manager controller, via a segment network connection
- 2.88 The lighting control panel shall support digital communications to facilitate the extension of control to include interoperation with building automation systems and other intelligent field devices. Digital communications shall be RS485 MS/TP-based using the BACnet® protocol
 - 2.88.1 The panel shall have provision for an individual BACnet device ID and shall support the full 2²² range (0 – 4,193,304). The device ID description property shall be writable via the network to allow unique identification of the lighting control panel on the network
 - 2.88.2 The panel shall support MS/TP MAC addresses in the range of 0 – 127 and baud rates of 9600k, 38400k, 76800k, and 115.2k bits per second
 - 2.88.3 Lighting control relays shall be controllable as binary output objects in the instance range of 1 – 64. The state of each relay shall be readable and writable by the BAS via the object present value property
 - 2.88.4 Lighting control relays shall report their true on/off state as binary input objects in the instance range of 1 – 64

- 2.88.5 The 99 group Normal Hours/After Hours control objects associated with the panel shall be represented by binary value objects in the instance range of 201 – 299. The occupancy state of each channel group shall be readable and writable by the BAS via the object present value property. Commanding 1 to a channel group will put all relays associated with the channel into the normal hours mode. Commanding 0 or NULL shall put the relays into the after hours mode
- 2.88.6 Setup and commissioning of the panel shall not require manufacturer-specific software or a computer. All configuration of the lighting control panel shall be performed using standard BACnet objects or via the handheld IR programming remote. Provide BACnet objects for panel setup and control as follows:
 - 2.88.6.1.1 Binary output objects in the instance range of 1 – 64 (one per relay) for on/off control of relays
 - 2.88.6.1.2 Binary value objects in the instance range of 1 -99 (one per channel) for normal hours/after hours schedule control
 - 2.88.6.1.3 Binary input objects in the instance range of 1 – 64 (one per relay) for reading true on/off state of the relays
 - 2.88.6.1.4 Analog value objects in the instance range of 101 – 199 (one per channel group) shall assign a blink warn time value to each channel. A value of 5 shall activate the blink warn feature for the channel and set a 5-minute grace-time period. A value of 250 shall activate the sweep feature for the channel and enable the use of sweep type automatic wall switches
- 2.88.7 The description property for all objects shall be writable via the network and shall be saved in non-volatile memory within the panel
- 2.88.8 The BO and BV 1 – 99 objects shall support BACnet priority array with a relinquish default of off and after hours respectively. Prioritized writes to the channel BV objects shall propagate prioritized control to each member relay in a way analogous to the BACnet Channel object described in addendum aa. (<http://www.bacnet.org/Addenda/Add-135-2010aa.pdf>)
- 2.88.9 Panel-aggregate control of relay Force Off at priority 2 shall be available via a single BV5 object. Force On at priority 1 shall be available via a single BV4 object
- 2.88.10 Lockout of all digital switch buttons connected to a given panel shall be command-able via a single BV2 object. The lock status of any connected switch station shall be represented as BV101-196

2.89 WattStopper Product Number: LMCP8, LMCP24 or LMCP48

USER INTERFACE

- 2.90 Each lighting control panel system shall be supplied with at least (1) handheld configuration tool (LMCT-100). As a remote programming interface the configuration tool shall allow setup, configuration, and diagnostics of the panel without the need for software or connection of a computer. The user interface shall have the following panel-specific functions as a minimum:
- 2.90.1 Set network parameters including panel device ID, MS/TP MAC address, baud rate and max master range.
 - 2.90.2 Relay Group creation of up to 99 groups. Group creation shall result in programming of all seven key relay parameters for member relays. The seven parameters are as follows: After-hours Override Time Delay, Normal Hours Override Time Delay, Action on Transition to Normal Hours, Action on Transition to After Hours, Sensor Action During Normal Hours, Sensor Action During After Hours, Blink-Warn Time for After Hours.
 - 2.90.3 Program up to 254 separate scheduled events. Events shall occur on seven day intervals with each day selectable as active or inactive, and shall be configurable as to whether the event is active on holidays. Holidays are also defined through the User Interface.
 - 2.90.4 Program up to 32 separate Dark/Light events. Events shall have a selectable source as either calculated Astro with delay, or a digital IO module with an integral 0-5V or 0-10V analog photocell. Dark/Light events shall occur on seven day intervals with each day selectable as active or inactive, and shall be configurable as to whether the event is active on holidays.
 - 2.90.5 Button binding of digital switches to groups shall be accessible via the handheld IR remote and accomplished from the digital switch station.
 - 2.90.6 Programming of panel location information shall be accomplished by the handheld IR remote and include at a minimum LAT, LON, DST zone, and an approximate city/state location.
 - 2.90.7 An additional handheld IR remote may optionally be specified to be permanently mounted to the panel interior via a retractable anti-theft lanyard to allow for convenient programming of the panel while assuring that the handheld programmer is always present at that panel. An unlimited number of handheld IR remotes may also be purchased for facilities staff as determined by the end user's representative.
- 2.91 WattStopper Product Number: LMCT-100

EMERGENCY LIGHTING CONTROL DEVICES

- 2.92 Emergency Lighting Control Unit – A UL 924 listed device that monitors a switched circuit providing normal lighting to an area. The unit provides normal ON/OFF control of emergency lighting along with the normal lighting. Upon normal power failure the emergency lighting circuit will close, forcing the emergency lighting ON until normal power is restored. Features include:
 - 2.92.1 120/277 volts, 50/60 Hz, 20 amp ballast rating
 - 2.92.2 Push to test button
 - 2.92.3 Auxiliary contact for remote test or fire alarm system interface
- 2.93 WattStopper Product Numbers: ELCU-100, ELCU-200

PART 3 - EXECUTION

PRE-INSTALLATION MEETING

- 3.1 A factory authorized manufacturer’s representative shall provide the electrical contractor a functional overview of the lighting control system prior to installation. The contractor shall schedule the pre-installation site visit after receipt of approved submittals to review the following:
 - 3.1.1 Confirm the location and mounting of all digital devices, with special attention to placement of occupancy and daylighting sensors.
 - 3.1.2 Review the specifications for low voltage control wiring and termination.
 - 3.1.3 Discuss the functionality and configuration of all products, including sequences of operation, per design requirements.
 - 3.1.4 Discuss requirements for integration with other trades

CONTRACTOR INSTALLATION AND SERVICES

- 3.2 Contractor to install all devices and wiring in a professional manner. All line voltage connections to be tagged to indicate circuit and switched legs
- 3.3 Contractor to install all room/area devices using manufacturer’s factory-tested Cat 5e cable with pre-terminated RJ-45 connectors. If pre-terminated cable is not used for room/area wiring, the contractor is responsible for testing each field-terminated cable following installation, and shall supply the lighting controls manufacturers with test results. Contractor to install any room to room network devices using manufacturer-supplied LM-MSTP network wire. Network wire substitution is not permitted and may result in loss of product warranty per DLM SEGMENT NETWORK section of specification.

Low voltage wiring topology must comply with manufacturer's specifications. Contractor shall route network wiring as shown in submittal drawings as closely as possible, and shall document final wiring location, routing and topology on as built drawings

- 3.4 Install the work of this Section in accordance with manufacturer's printed instructions unless otherwise indicated. Before start up, contractor shall test all devices to ensure proper communication
- 3.5 Calibrate all sensor time delays and sensitivity to guarantee proper detection of occupants and energy savings
 - 3.5.1 Adjust time delay so that controlled area remains lighted while occupied
- 3.6 Provide written or computer-generated documentation on the configuration of the system including room by room description including:
 - 3.6.1 Sensor parameters, time delays, sensitivities, and daylighting setpoints.
 - 3.6.2 Sequence of operation, (e.g. manual ON, Auto OFF. etc.)
 - 3.6.3 Load Parameters (e.g. blink warning, etc)
- 3.7 Post start-up tuning – After 30 days from occupancy contractor shall adjust sensor time delays and sensitivities to meet the Owner's requirements. Provide a detailed report to the Architect / Owner of post start-up activity

FACTORY SERVICES

- 3.8 Upon completion of the installation, the manufacturer's factory authorized representative shall start up and verify a complete fully functional system
- 3.9 The electrical contractor shall provide both the manufacturer and the electrical engineer with three weeks written notice of the system start up and adjustment date
- 3.10 Upon completion of the system start up, the factory-authorized technician shall provide the proper training to the owner's personnel on the adjustment and maintenance of the system

COMMISSIONING SUPPORT SERVICES

- 3.11 On this project, a commissioning agent will be hired to verify the installation and programming of all building systems, which includes the lighting control system. Manufacturer should include an extra day of technician's time to review the functionality and settings of the lighting control hardware with the commissioning agent, including reviewing submittal drawings and ensuring that instructions on how to configure each device are readily available. Manufacturer is NOT responsible for helping the commissioning agent inspect the individual devices. It will be the commissioning agent's responsibility to create and complete any forms required for the commissioning

process, although the manufacturer or contractor may offer spreadsheets and/or printouts to assist the agent with this task.

- 3.12 The commissioning agent shall work with the electrical contractor during installation of the lighting control hardware to become familiar with the specific products. The agent may also accompany the manufacturer's technicians during their start-up work to better understand the process of testing, calibration and configuration of the products. However, the contractor and manufacturer shall ensure that interfacing with the agent does not prevent them from completing the requirements outlined in the contract documents

END OF SECTION

SECTION 26 24 16
PANEL BOARDS

PART 1 – GENERAL

- 1.1 Furnish and install branch circuit panel boards as specified herein and as indicated on the drawings. Submit manufacturers' data on all items.
- 1.2 Submit manufacturers' data on all panel boards and components including:
 - 1.2.1 Enclosures and covers
 - 1.2.2 Breakers
 - 1.2.3 Surge Protective Device (SPD) equipment
 - 1.2.4 Incident energy level calculations
 - 1.2.5 Common submittal mistakes which will result in the submittals being rejected:
 - 1.2.5.1 Not arranging the circuit breakers in panels to match the orientations indicated on the drawings. In other words, if a 30 amp breaker is shown on the drawing in Space #2, this must be the location it appears on the submittal schedule. Standard factory arrangements will not be accepted.
 - 1.2.5.2 Not including all items listed in the above itemized description.
 - 1.2.5.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.2.5.4 Not including actual manufacturer's catalog information of proposed products.
 - 1.2.5.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

- 2.1 The interrupting rating of circuit breakers shall be 10,000 amps for the 120/208 system and 14,000 amp for 277/480 volt systems. Refer to drawings for higher interrupting rating requirements. All components and equipment enclosures shall be manufactured by the same manufacturer. Circuit breakers shall be permitted to be series rated to limit the available fault current to no more than the above ratings.

- 2.2 All panels shall be fully bussed. Recessed panel enclosures shall be a maximum of 20" wide and 5-3/4" deep for all panels 600 amp rated and less.
- 2.3 All busses shall be tin-plated aluminum and shall be located in the rear of the panelboard cabinet. Individual circuit breakers shall be bolt on type and removable from the cabinet without disturbing the bussing in any way. All panel boards shall contain ground busses.
- 2.4 Panel covers shall be door in door style, with one lock. Door lock shall allow access to breakers only. Access to wireways without removal of cover shall be permitted by (non removable) screws behind the locked door. Panel cover shall be provided with full length piano hinge. All locks for all panels provided in this project shall be keyed alike.
- 2.5 Each panel shall have a two-column circuit index card set under glass or glass equivalent on the inside of the door. Each circuit shall be identified as to use and room or area. Areas shall be designated by room numbers. Room numbers shown on the drawings may change and contractor shall verify final room numbers with the architect prior to project completion.
- 2.6 Tandem mounted or wafer type breakers are not acceptable.
- 2.7 Multiple breakers shall have one common trip handle or be internally connected. Handle ties are not acceptable.
- 2.8 Breaker arrangements shown in the drawings shall be maintained. The circuit breakers in panels must match the orientations indicated on the drawings. In other words, if a 30 amp breaker is shown on the drawing in Space #2, this must be the location it appears on the submittal schedule. Standard factory arrangements will not be accepted.
- 2.9 Where conductor sizes exceed the standard breaker lug wire range, or where multiple conductors per phase are required, the panelboard manufacturer shall provide the breaker with suitable lugs for terminating the specified conductors.
- 2.10 Acceptable manufacturers are Square D, Eaton, Siemens or General Electric.
- 2.11 Equipment manufactured by any other manufacturers not specifically listed in Section 2.10 are not considered equal, or approved for use on this project.

Surge Protective Device (SPD)

- 2.12 Surge Protective Device (SPD) panelboards, shall be provided with an integrated circuit breaker panelboard and parallel connected suppression / filter system in a single enclosure. The SPD panelboard shall meet the following parameters: IEEE C62.41.1, IEEE C62.41.2, IEEE C62.45, UL 1283 and the UL 1449, Third Edition, effective September 29, 2009.
- 2.13 The panelboard shall be UL 67 Listed and the SPD shall be UL 1449 labeled as Type 1 or Type 2 or as Type 4 intended for Type 1 or Type 2 applications. SPD shall be factory installed integral to the panel board.

2.14 The SPD panelboard shall be top or bottom feed according to requirements. A circuit directory shall be located inside the door.

2.15 SPD shall meet or exceed the following criteria:

2.15.1 For standard areas supply SPD having 100kA per phase surge current capacity. For mountain and desert areas (areas with over 5 lightning strikes per year), SPD shall have a per phase surge current capacity of 200kA.

2.15.2 UL 1449 – Third Edition Revision; effective September 29, 2009, Voltage Protection Ratings shall not exceed the following:

<u>VOLTAGE</u>	<u>L-N</u>	<u>L-G</u>	<u>N-G</u>	<u>L-L</u>	<u>MCOV</u>
208Y/120	700V	700V	700V	1200V	150V
480Y/277	1200V	1200V	1200V	2000V	320V

2.15.3 SPD shall be UL labeled with 100kA Short Circuit Current Rating (SCCR).

2.16 UL 1449 - Third Edition Revision; effective September 29, 2009, Voltage Protection Ratings shall not exceed the following:

<u>VOLTAGE</u>	<u>L-N</u>	<u>L-G</u>	<u>N-G</u>	<u>L-L</u>	<u>MCOV</u>
208Y/120	700V	700V	700V	1200V	150V
480Y/277	1200V	1200V	1200V	2000V	320V

2.17 SPD shall be UL labeled with a minimum 100kVA short circuit rated (SCCR).

2.18 UL 1449 Listed Maximum Continuous Operating Voltage (MCOV) (verifiable at UL.com):

<u>System Voltage</u>	<u>Allowable System Voltage Fluctuation (%)</u>	<u>MCOV</u>
208Y/120	25%	150V
480Y/277	15%	320V

2.19 SPD shall incorporate a UL 1283 listed EMI/RFI filter with minimum attenuation of - 50dB at 100 kHz. No filtering is required for a 100kA SPD.

2.20 Suppression components shall be heavy duty 'large block' MOVs, each exceeding 30mm diameter.

2.21 Type 4 SPD shall include a serviceable, replaceable module.

2.22 SPD shall be equipped with the following diagnostics:

2.22.1 Visual LED diagnostics including a minimum of one green LED indicator per phase, and one red service LED.

2.22.2 No other test equipment shall be required for SPD monitoring or testing before or after installation.

- 2.23 SPD shall have a response time no greater than 1/2 nanosecond
- 2.24 SPD shall have a 10 year warranty
- 2.25 The SPD panelboard shall have removable interior
- 2.26 The SPD panelboard main bus shall be aluminum and rated for the load current required
- 2.27 The SPD panelboard shall include a 200% rated neutral assembly with copper neutral bus
- 2.28 The unit shall be provided with a safety ground bus

(SPD) Quality Assurance

- 2.29 Manufacturer Qualifications: Engage a firm with at least 5 years experience in manufacturing transient voltage surge suppressors.
- 2.30 Manufacturer shall be ISO 9001 or 9002 certified.
- 2.31 The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of ten (10) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.
- 2.32 The SPD shall be compliant with the Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC.

PART 3 – EXECUTION

- 3.1 Painting of panelboard covers in finished areas shall be done by the general contractor.
- 3.2 Provide a spare 3/4" conduit stubbed to an accessible area for each of every three (3) spares or spaces provided in recessed panel boards.
- 3.3 All lugs shall be torque tested in the presence of the inspector of record.

Arc Flash and Shock Hazard

- 3.4 The Contractor is to provide, and submit to the engineer for approval, incident energy level calculations as determined using the methodologies described in NFPA 70E or IEEE standard 1584-2002.
 - 3.4.1 All studies shall be performed by “Emerson Electric” (858) 695-9551, MTA (858) 472-0193, or Terra Power Solutions (858) 380-8170. Studies performed by manufactures or other engineering or testing companies must submit qualifications for approval by Johnson Consulting Engineers, 7 days prior to bid for this project.

- 3.5 A warning label, as specified in the above standard, shall be placed on each switchboard, panelboard, and safety switch indicating the incident energy levels on the equipment to warn qualified personnel in accordance with NFPA 70E, section 110.16 Labels shall be laminated white micarta with black lettering on each. Letters shall be no less than 3/8" high.
- 3.6 The incident level calculations for each piece of equipment shall be given to the owner and maintained on file by the maintenance department
- 3.7 The design goal is to minimize the incident energy to which a maintenance employee may be exposed.

END OF SECTION

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SECTION 26 27 26
SWITCHES AND RECEPTACLES

PART 1 – GENERAL

- 1.1 Furnish and install all wiring devices as shown on drawings and as herein specified. Unless otherwise noted, device and plate numbers shown are Hubbell and shall be considered the minimum standard acceptable. Other acceptable manufacturers are Pass and Seymour, Leviton, General Electric and Bryant.
- 1.2 Submit manufacturers' data on all items.
- 1.3 **Common submittal mistakes which will result in the submittals being rejected:**
 - 1.3.1 Not correctly indicating ampacity rating of proposed devices.
 - 1.3.2 Not including all items listed in the above itemized description.
 - 1.3.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.4 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

- 2.1 All switches shall be of the quiet mechanical type, Specification Grade, 20 amp, 120/277 volt AC as follows:

	<u>HUBBELL</u>	<u>LEVITON</u>	<u>PASS & SEYMOUR</u>
Single Pole	CS120	CS1202	CS20AC1
Two Pole	CS1222	CS2202	CSB20AC2
Three-way	CS320	CS3202	CS20AC3
Key Switch	HBL1221L	1221-2 L	PS20AC1-L

- 2.2 All switches shall have the "on" and the "off" position indicated on the handle. If switches of higher ampere ratings are required, they shall be of similar type and quality as those shown above. Groups of switches shown at one location shall be installed under a single plate up to a maximum of six where more than six switches are shown coordinate arrangement with the Architect.
- 2.3 Dimmer switches for incandescent lamp loads shall be square-law type, slide control dimmer with OFF position, Lutron or Hubbell "Nova-T" Series NT-600 (0-500 watt load), NT-1000 (501-900 watt load), NT-1500 (901-1500 watt load), or equal (no known equal).

- 2.4 All convenience receptacles and special outlets throughout shall be grounding type. Convenience receptacles shall be side wired, parallel slot, two pole, three wire, 20 amp as follows:

	<u>HUBBELL</u>	<u>LEVITON</u>	<u>PASS & SEYMOUR</u>
Duplex	5352	5362	PS5362
GFCI	GFR5362	7899	2097
Isolated Ground	IG5362	5362IG	IG6300
Tamper Proof	8300SG	TR63H	

- 2.5 All safety or tamper proof receptacles shall have no exposed external current carrying metal parts, and shall have integral wiring leads suitable for two or three wire installations.
- 2.6 Special receptacles shall be as noted on the drawings.
- 2.7 Weatherproof plates shall be designed to meet CEC Article 410-57, wet location listed with cover "open." Where weatherproof receptacles have been identified to be provided with locking covers, the cover shall be as manufactured by Pass & Seymour #4600-8 or Cole Lighting 310 Series. Rough-in requirements vary between manufacturers. Contractor to field verify requirements prior to installation.
- 2.8 All plates throughout shall be stainless steel. Where wiring devices are installed in concrete block walls, provide oversized 3-1/2" x 5" coverplates.
- 2.9 All devices shall be white unless otherwise noted or a special purpose outlet.
- 2.10 Unless where specifically detailed on the drawings, floor boxes shall be PVC suitable for concrete poured floors of minimum 3-1/2" depth, with a modular design to gang two or three sections together.
- 2.10.1 Carlon #E976 series or approved equal
- 2.10.2 Provide brass cover with brass carpet flange unless otherwise detailed.

PART 3 – EXECUTION

- 3.1 Switches for room lighting shall be located no more than 12" center line from door jamb at plus 48" center line above finished floor or +46" to top of devices where located over casework, reference CBC Figure 11B-5D.
- 3.2 All receptacles shall be mounted at plus 18" to center line above finished floor unless noted or shown otherwise. All receptacles shall be installed with the ground pin up, at the top of the receptacle to comply with IEEE 602-1986.
- 3.3 Furnish and install wall plates for all wiring devices, and outlet boxes, including special outlets, sound, communication, signal, and telephone outlets, etc. as required. All cover plates shall be appropriate for type of device.

END OF SECTION

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SECTION 26 28 16
DISCONNECTS

PART 1 – GENERAL

- 1.1 Furnish and install all disconnect switches as shown on the drawings and as required by the CEC.
- 1.2 Submit manufacturers' data for all disconnects and fuses.
 - 1.2.1 Disconnects
 - 1.2.2 Fuses
- 1.3 **Common submittal mistakes which will result in the submittals being rejected:**
 - 1.3.1 Not including all items listed in the above itemized description.
 - 1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.3 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

- 2.1 Acceptable manufacturers shall be Square D, Cutler Hammer, Siemens or General Electric.
- 2.2 Equipment manufactured by any other manufacturers not specifically listed in Section 2.1 are not considered equal, or approved for use on this project.
- 2.3 All switches shall be heavy-duty type, externally operated, quick-make, quick-break, rated 600 volts or 240 volts as required, with the number of poles and ampacity as noted. All switches for motors shall be HP rated. Switches shall have NEMA-Type 1 enclosures, except switches located where exposed to outdoor conditions shall have NEMA Type 3R enclosure. Switches generally shall be fused except where noted to be non-fused on the drawings.
- 2.4 Where fuses are indicated, fuses shall be Bussman or Littlefuse (no known equal). Fuses shall be current limiting type with time delay characteristics to suit the equipment served.

PART 3 – EXECUTION

- 3.1 Mount all switches to structure or U-channel support. U-channel supports shall be cleaned and painted to prevent rust.
- 3.2 Switches shall be accessible with proper clearances in front per CEC 110-16.
- 3.3 All lugs shall be torque tested in the presence of the inspector of record.
- 3.4 Arc Flash and Shock Hazard
 - 3.4.1 The contractor is to provide, and submit to the engineer for approval, incident energy level calculations as determined using the methodologies described in NFPA 70E or IEEE standard 1584-2002.
 - 3.4.2 A warning label, as specified in the above standard, shall be placed on each switchboard, panelboard, and safety switch indicating the incident energy levels on the equipment to warn qualified personnel in accordance with NFPA 70E, section 110.16 Labels shall be laminated white micarta with black lettering on each. Letters shall be no less than 3/8" high.
 - 3.4.3 The incident level calculations for each piece of equipment shall be given to the owner and maintained on file by the maintenance department.
 - 3.4.4 The design goal is to minimize the incident energy to which a maintenance employee may be exposed and in no case more than 8 cal./cm².

END OF SECTION

SECTION 26 51 14
LED LIGHTING FIXTURES AND LAMPS

PART 1 – GENERAL

- 1.1 Furnish and install all lighting fixtures with lamps as specified and as shown on the drawings. Fixtures shall be complete including canopies, hanger, diffusers, ballasts, etc.
- 1.2 Submit manufacturer's data for each fixture type including the following:
 - 1.2.1 Lighting fixture catalog data and photometry.
 - 1.2.2 Lamp catalog data for each fixture type.
 - 1.2.3 Driver catalog data for each fixture type.
 - 1.2.4 Fixture warranty.
- 1.3 **Common submittal mistakes which will result in the submittal being rejected:**
 - 1.3.1 Not including lamp and driver information for each fixture type.
 - 1.3.2 Not including all items listed in the above itemized description.
 - 1.3.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.4 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PRODUCT SUBSTITUTION

- 1.4 All substitutions or alternate fixtures to those indicated on the project fixture schedule shall be submitted for approval (7) business days prior to the project bid date. Approvals when accepted will be issued in the form of an addendum. No consideration for substitutions will be provided after the award of the contract.
 - 1.4.1 The substitution request must include a statement indicating the difference in price of both the specified and alternate product, both contractor and list price. The substitution request must include a comparison of the total fixture wattage, total fixture lumens, fixture efficiency and warranty comparison.
 - 1.4.2 When proposing to substitute lighting fixture and/or fixture retrofit, a point by point photometric calculation of a typical application as used in this project shall be included. A calculation of the specified and the proposed alternate shall be included.

PART 2 – PRODUCTS

- 2.1 All catalog numbers are given for manufacturer's identification and shall not relieve Contractor from responsibility of full conformance to all applicable written description requirements governing material and fabrication, either in the general or specific sections. Where catalog numbers are indicated as modified, no modification will be required if the standard unit fully conforms to descriptive requirements in the Specifications and matches specified ceiling.
- 2.2 All fixtures of the same type shall be of one manufacturer and of identical finish and appearance. All fixtures and component parts shall bear the UL label.
- 2.3 All steel parts shall be phosphate treated in multistage power spray system for corrosion resistance and paint adhesion. Final finish shall be electrostatically applied baked white enamel of not less than 87 pct. reflectance on reflecting surfaces.
- 2.4 Each fixture shall have a continuous light-seal gasket seated in such manner as to prevent any light leak through any portion or around any edge of the trim frame.
- 2.5 Diffusers shall be framed in a hinged, continuous assembly. Diffuser frame latches shall be spring-loaded or cam-operated.
- 2.6 All recessed fixtures shall be provided with frames appropriate for the type of ceiling involved. No fixtures shall be ordered until the ceiling construction has been verified by the Contractor.

MINIMUM LUMINARY REQUIREMENTS

- 2.7 Electrical Components, Devices and Accessories: Listed and labeled as defined in NFPA 70 by a qualified testing agency, and marked for intended location and application.
- 2.8 Recessed Fixtures: Comply with NEMA LE 4.
- 2.9 CRI of **minimum 80 CCT of 4100 K.**
- 2.10 Rated lamp life of 50,000 hours minimum.
- 2.11 Lamps dimmable from 100 percent to 0 percent of maximum light output.
- 2.12 Nominal Operating Voltage: **120 V / 277 V ac**

PART 3 – EXECUTION

- 3.1 All lighting fixtures shall be supported as follows:
 - 3.1.1 From the outlet box by means of a metal strap where its weight is less than five pounds.
 - 3.1.2 From its outlet box by means of a hickey or other threaded connection where its weight is from five to fifty pounds.

- 3.1.3 Directly from the structural slab or joists where its weight exceeds fifty pounds.
- 3.1.4 Lighting fixtures shall be supported independent of the ceiling system or additional ceiling support must be added to carry the weight of the lighting fixtures. Recessed lighting fixtures supported from ceiling grid tees shall be furnished with hold down clips in conformance with CEC 410 - 16, spring clips will not be permitted. All fixtures which the manufacturer has not provided UL approved clips, must be attached to the fixture and ceiling grid by metal screws.
- 3.2 Furnish and install supplementary blocking and support as required to support fixture from structural members. Contractor shall submit proposed blocking method for all suspended lighting fixtures for approval prior to rough in.
- 3.3 Suspended and/or pendant mounted fixtures shall be provided with four aircraft safety cables extending in opposite directions, attached to the fixture, and supported from a structural member. The contractor shall submit proposed fixture mounting and aircraft cable attachment methods for approval prior to fixture rough in.
- 3.4 Class 1 wiring to the fixture must be installed either conduit or type MC-PCS cabling no open wiring shall be permitted.
- 3.5 Chain suspension may be used only where specifically permitted on the drawings. Chain shall be heavy duty, nickel or cadmium plated, suitable for weight of specific fixture.
- 3.6 Shop drawings shall be furnished for each fixture type. Catalog cuts, illustrating conformance with specifications, will be acceptable for standard units. Shop drawings shall indicate materials, assembly, finish and dimensions.
- 3.7 Photometric data shall be furnished for any fixture substituted for those listed on the schedule.
- 3.8 Any driver which produces a greater than normal amount of noise shall be replaced by the contractor. Normal will be determined by the level of sound produced by other similar fixtures operating in the area.

END OF SECTION

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SECTION 26 90 90
ELECTRICAL CLOSEOUT

PART 1 – GENERAL

- 1.1 Upon completion of the electrical work, the entire installation shall be tested by the Contractor, and demonstrated to be operating satisfactorily to the Architect, Engineer, Inspector and Owner.
- 1.2 All testing and corrections shall be made prior to demonstration of operation to the Architect, Engineer, Inspector and Owner.
- 1.3 In addition to the demonstration of operation, the Contractor is also required to review the content and quality of instructions provided on items demonstrated with the Architect, Engineer, Inspector and Owner.

PART 2 – EXECUTION

- 2.1 Wiring shall be tested for continuity, short circuits and/or accidental grounds. All systems shall be entirely free from “grounds,” “short circuits,” and any or all defects.
- 2.2 Motors shall be operating in proper rotations, and control devices functioning properly. Check all motor controllers to determine that properly sized overload devices are installed, and all other electrical equipment for proper operation.
- 2.3 Tests and adjustments shall be made prior to acceptance of the electrical installation by the Architect, and a certificate of inspection and acceptance of the electrical installation by local inspection authorities shall be provided.
- 2.4 All equipment or wiring provided which tests prove to be defective or operating improperly shall be corrected or replaced promptly, at no additional cost to the Owner.
- 2.5 Test all motor and feeder circuits with a “megger” tester to determine that insulation values conform to Section 110-20, California Electrical Code (CED). Test reports must be submitted and approved by the engineer before final acceptance.
- 2.6 Test all grounding electrode connections to assure a resistance of no more than 10 ohms is achieved. Augment grounding until the ohmic value stated above is achieved. Provide certified test results to the Architect, Engineer and Inspector.

END OF SECTION

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SECTION 27 01 00
COMMUNICATIONS GENERAL PROVISIONS

ARTICLE 1 - SUMMARY

- 1.1 This Division of the specifications outlines the provisions of the contract work to be performed as a sub contract under the Division 26 scope of work. Reference the Division 26 Electrical General Provisions for scope of work and general requirements.
- 1.2 In addition, work in this Division is governed by the provisions of the bidding requirements, contract forms, general conditions and all sections under Division 1 requirements.

END OF SECTION

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SECTION 27 10 00

VOICE / DATA / IP INTERCOM-CLOCK INFRASTRUCTURE

PART 1 – GENERAL

- 1.1 Include all labor, equipment and materials necessary for providing a complete networking infrastructure system as described herein and/or as indicated on the drawings.
- 1.2 Related specification sections:
 - 1.2.1 Section 26 01 00 - General Provisions
 - 1.2.2 Section 26 05 33 - Conduit and Fittings
 - 1.2.3 Section 26 05 19 - Conductors
 - 1.2.4 Section 26 05 34 – Outlet and Junction Boxes
- 1.3 Approved Products and minimum contractor certifications
 - 1.3.1 All components shall be manufactured by one of approved manufacturers, the installing contractor must have the accompanying certification from the product manufacturer for installation of a “Warranted System” as required by each manufacturer and as indicated in these specifications. **Acceptable manufacturers are:**
 - 1.3.2 **TYCO**
 - 1.3.2.1 Installing contractor must be **Commscope or AMP** certified to install this system.
 - 1.3.2.2 **Pursuant to Public Contract Code Section 3400(b), the materials, products, things or services in this Specifications section are designated by specific brand name or trade name for the purposes of matching other products in existing District projects to establish District-wide uniform, complete and compatible systems in order to facilitate the most technologically competitive and feasible education for school children in the District. A copy of the District findings and Resolution in accordance with Public Contract Code Section 3400(b) is available upon written request at the District.**
 - 1.3.3 Systems or components as manufactured by any other manufacturers which, are not specifically listed in 1.3.2 are **not** approved for use on this project. Specified system warranties are to be established between the component manufacturers and the owner, warranties between the cable manufacturer or installing contractor and the owner are not considered equal.

- 1.3.4 Installing contractor qualifications: Firms and their personnel must be regularly engaged in the installation of data networking cabling and equipment for systems of similar type and scope. The contractor must have a full service office able to respond to emergency callouts during the warranty period. The contractor must also provide complete installation of all wiring and devices or equipment. Subcontracts with electrical contractors or other warranted or non-warranted contractors for supervised installation of any part of this system are not approved. All conduit and standard back boxes will be furnished and installed by the electrical contractor. Specialty boxes will be furnished by the equipment supplier and installed by the electrical contractor.
- 1.3.5 Equipment qualifications: It is the intent of these specifications that each bidder provides all hardware, components and installation services that are necessary to ensure a fully operational Augmented Category-6 wiring system including warranties, proposed in the EIA/TIA Category-6A and the ISO Class E drafts.
- 1.3.6 **Warranty: Warranty shall be a full “Performance Warranty” installed by a “Certified Contractor” as specified by one of the approved manufacturer’s A “Component Warranty” will not be considered equal.** All components, labor, and 'Link Performance Criteria" shall be warranted by one of the approved manufacturers. Warranty shall be to the customer for 25-years (some warranty programs may be greater, this is a minimum requirement) after Customer acceptance and sign-off of the completed system. **The contractor must provide documentation from one of the approved manufacturers as indicated in Section 1.3.2 indicating their qualifications for installation of this system in compliance with the manufacturers warranty requirements as a warranted contractor.**
- 1.4 In order to ensure project cohesion, a single point of contact is required to provide a “TURNKEY” solution. The work covered under this section of the specification consists of furnishing all labor; cabling; equipment; supplies; materials, and training. The Contractor will perform all operations necessary for the “TURNKEY” and fully completed installation in accordance with the specifications herein. As such, the successful contractor must be factory trained on all aspects of system hardware. The successful Contractor shall be a California licensed C7 or C10 premise wiring contractor as defined in this specification. Subcontractors may not be utilized in the implementation of the plant wiring installation or certification process. The contractor shall provide a licensed, qualified electrical contractor for installation of all conduits, outlet and junction boxes, trenching and pull box installations.
- 1.5 The drawings indicate a schematic routing of cables above ceilings. The Contractor shall field-verify the most appropriate routing of all above-ceiling cable prior to bid. Where cables penetrate through walls a conduit sleeve shall be provided. **Where cables pass through fire rated walls, the conduit sleeve shall be sealed to maintain the rating of the wall assembly.**

- 1.6 Phase I Submittal shall be made **within (20) working days** after the award of the contract by the District. This submittal shall include the following:
- 1.6.1 Complete bills of quantities, including all materials, components, devices, and equipment required for this work. The bills of quantities shall be tabulated respective of each and every system as specified, and shall contain the following information for each Section listed:
 - 1.6.1.1 Description and quantity of each item.
 - 1.6.1.2 Manufacturer's Name and Model Number.
 - 1.6.1.3 Manufacturer's Specification Sheet.
 - 1.6.2 Include with submittals all warranty information and a description of support and maintenance services to be provided. Also include all licenses and maintenance agreements required for continued operation of the equipment.
- 1.7 Phase II submittal shall be provided **within (20) working days** after the approval of the Phase I submittals and prior to any fabrication or field conduit installations. All shop drawings shall be engineered and drawn on a CAD System. Each submission shall include 'D' or 'E' size print copies to match the contract drawings, and (1) Phase II submittals drawings shall include the following.
- 1.7.1 MDF or IDF equipment or rack elevations will be required to be provided including, cable routing and position of all components.
 - 1.7.2 Provide labeling plan which identifies the proposed scheme for identifying all components including Racks, patch panels (fiber and copper), ports and cables (fiber and copper).
- 1.8 The contractor shall make a **written** request directly to Johnson Consulting Engineers for electronic drawing files. As a part of the written request, please include the following information:
- 1.8.1 Clearly indicate each drawing sheet needed (i.e., E1.1, E2.1, etc.).
 - 1.8.2 Identify the name, phone number, mailing address and e-mail address of the person to receive the files.
 - 1.8.3 Provide written confirmation and agreement with the requirements described for payment of computer files, as described below.
 - 1.8.4 Detail or riser diagram sheets, or any other drawings other than floor plans or site plans, **will not be made available to the contractor.**
 - 1.8.5 Files will only be provided in the AutoCAD format in which they were created (i.e., version 14 or version 2000i).

- 1.8.6 Requests for files will be processed as soon as possible; a minimum of 7 working days should be the normal processing time. The contractor shall be completely responsible for requesting the files in time for their use.
- 1.8.7 CAD files will be made available via e-mail or on disk, depending on the quantity of files requested. The contractor requesting the files will be required to pay \$50.00 per drawing plan, or \$300.00 maximum, whichever is less.

PART 2 - PRODUCTS

- 2.1 Equipment racks have been detailed on the drawings and additional component information requirements have been described in the MDF or IDF products sections. The following is a list of approved manufacturers for each type of rack system.
 - 2.1.1 Alternate equipment manufacturers other than those indicated will not be reviewed or approved for use on this project.
 - 2.1.2 **(Open Frame) 4-Post** shall be manufactured by B-Line, Chatsworth CPI or Middle Atlantic. Reference drawing details and specifications for complete requirements.

Main Distribution Frame (Existing)

- 2.1 The Main Distribution Frame shall be the central wiring and equipment location for the infrastructure systems. The contractor shall include the following items at this location.
 - 2.1.1 **Data Infrastructure Fiber Optic Feed Cables** - Fiber optic termination equipment (rack mounted), including all associated installation hardware. The equipment must have sufficient number of ports to connect all fibers in every cable terminated at this location. Provide 25% spare capacity for future wiring requirements. All fiber feed cables shall be terminated in a single fiber optic patch panel up to 144 strands. Additional strands shall be terminated in the largest size required to contain the remaining fibers. Data fiber optic feed patch panels shall be terminated separately from the feed cables for the voice switch.
 - 2.1.2 MDF equipment mounting rack is existing. Provide all accessories whether shown on drawings or in specifications.
 - 2.1.3 Additional items required for the MDF are as follows:
 - 2.1.3.1 Fiber optic patch cord optical fibers shall be 50/125um micron laser-optimized multimode optical glass for dual operation at 850nm and 1300nm wave length. Fiber optic patch cords shall be terminated with duplex SC connectors on both ends with ceramic ferrules. Each IDF closet requires (2) patch cords for connection to the Data

Infrastructure MDF Rack. All patch cords shall be Aqua (Lt.Blue) in color. Patch cords shall be 10 feet (3-meters) in length.

2.1.3.2 Provide a Leviton Recloseable Storage Ring, Outside Plant (24" diameter) 48900-OFR

2.1.3.3 Provide all other items as detailed on the drawings.

Intermediate Distribution Frame

2.2 The Intermediate Distribution Frame shall be a secondary wiring and equipment location for the data networking system. The contractor shall include the following items at this location.

2.2.1 Provide 8'-0" high x 3/4" thick, as detailed on drawings, flame resistant plywood mounting backboard, painted with fire resistant paint white or color to match. Contractor shall provide minimum one side finish grade plywood. **Backboard shall be mounted with finish side out, regardless of location of fire rating stamp. Once stamp has been confirmed by the IOR, the stamps can be painted over. Do not leave any portion of the backboard unpainted.**

2.2.2 Fiber optic termination equipment (rack mounted), including all associated installation hardware for fiber feed cables. The equipment must have sufficient number of ports to connect all fibers in every cable terminated at this location. Provide 25% spare capacity for future installation. All fiber optic patch panels shall be provided fully loaded with SC bulkheads. Patch panel shall be 24-port patch panel minimum.

2.2.3 Augmented Category-6A Commscope Modular Patch Panel (rack mounted), with RJ45 style connectors for terminating all twisted pair cable from each Voice/Data/IP Page outlet served from this location. The patch panels shall be installed as a fully loaded kit, complete with edge connectors, housings, panel assembly and connector faceplates. Provide a minimum of 25% spare capacity for future wiring requirements. All patch panels shall be 16 or 32 port panel assemblies. Provide cable support bars at the rear of each patch panel TYCO #557548-1. Terminate the data cables from the audio-visual systems in the same patch panels.

2.2.4 Provide 24-port, RJ45, single pair per port, voice patch panel for the extension of the voice feed cable from the termination blocks on the backboard to the equipment rack. Provide 25-Pair tail from the punch blocks to the equipment rack. See the drawing details for additional requirements. All pairs shall be tested for continuity and polarity back to the Campus MDF Room.

2.2.5 Provide equipment mounting rack or enclosure as detailed in the drawings. Provide ladder rack bracing at top of rack back to wall and seismic bolting to

floor and wall as shown on detail drawings. Provide all accessories whether shown on drawings or in specifications. Rack shall be furnished with the following accessories:

- 2.2.5.1 Provide (1) adjustable full depth vented shelf for each four post Quadrarack.
- 2.2.5.2 Provide full length vertical wire managers, CPI Part #30161-703, on each side of each rack section, or between racks for full height four-post Quadraracks.
- 2.2.5.3 (1) Grounding kit connect grounding conductor to nearest ground buss bar. CPI Part #41016-001 or equal.
- 2.2.5.4 Provide horizontal wire managers between each patch panel. Provide (2) spare managers per rack section. Horizontal managers must be a minimum of (2) RMU in height. CPI Part # 12542-x19 or equal.
- 2.2.5.5 (2) horizontal rack mounted surge arrest style power strips "APC" #NET9RM with guarded master on-off switch where shown on drawings. Provide with minimum 15-foot cord.
- 2.2.5.6 Provide an uninterruptible power supply, 120 volt, rack-mounted at the IDF location. UPS shall be provided with backplane configuration containing;

Output receptacles (minimum)

- 2.2.5.7 Backplane total - (6) NEMA 5-15R and (2) NEMA 5-20R receptacles, 120 volt non-locking.

Input receptacle (minimum)

- 2.2.5.8 (1) 30-amp, 120 volt, locking, NEMA L5-30P plug installed on 8'-0" power cord.
- 2.2.5.9 APC" Smart-UPS Model #SMX2200RMLV2U with Optional Network Card Model #AP9631 with environmental monitoring capability

2.2.6 Additional items required at each IDF closet are as follows:

- 2.2.6.1 Fiber optic patch cord optical fibers shall be 50/125um micron laser-optimized multimode optical glass for dual operation at 850nm and 1300nm wave length. Fiber optic patch cords shall be terminated with duplex SC connectors on both ends with ceramic ferrules. Each IDF closet requires (2) patch cords for connection to the Data

Infrastructure MDF Rack. All patch cords shall be Aqua (Lt.Blue) in color. Patch cords shall be 10 feet (3-meters) in length.

- 2.2.6.2 Provide (1) Recloseable Storage Ring, Outside Plant (24" diameter) 48900-OFR
- 2.2.6.3 Provide (white) Augmented Category-6 (patch panel end) patch cords with pre-molded boot, provide quantity equal to 50% of the total voice/data cable drops or ports provided. Verify with Customer all ports which will be activated. All patch cords to be installed by contractor. Allow for 15% of total copper patch cords required to be (7) feet in length, and all remaining patch cords shall be (4) feet in length. Patch cords shall be in compliance with the manufacturer's "Link" warranty requirements.
- 2.2.6.4 Provide (color per detail drawings and station insert color) Augmented Category-6 (patch panel end) patch cords with pre-molded boot, provide quantity equal to 100% of the total IP Clock/Speakers, Wireless Access Points, LCD Projector/Audio-Visual and IP camera cable drops or ports provided. Verify with Customer all ports which will be activated. All patch cords to be installed by contractor. All patch cords shall be (4) feet in length, unless otherwise shown in the drawings or specifications. Patch cords shall be in compliance with the manufacturer's "Link" warranty requirements.
- 2.2.6.5 Provide (blue) Augmented Category-6 (workstation end) patch cords with pre-molded boot, provide quantity equal to 50% of the total voice/data cable drops or ports provided. Verify with Customer all ports which will be activated. All patch cords to be installed by contractor. Provide for 10% of total copper patch cords required to be (15) feet in length and all remaining patch cords shall be (10) feet in length. Patch cords shall be in compliance with the manufacturer's "Link" warranty requirements.
- 2.2.6.6 Provide (color per detail drawings and station insert color) Augmented Category-6 (workstation end) patch cords with pre-molded boot, provide quantity equal to 100% of the total Wireless Access Points, LCD Projector/Audio-Visual and IP camera cable drops or ports provided. Verify with Customer all ports which will be activated. All patch cords to be installed by Contractor. All patch cords shall be (2) feet in length, unless otherwise shown in the drawings or specifications. Patch cords shall be in compliance with the manufacturer's "Link" warranty requirements. Patch cords for the IP Clock/Speakers is shown in the paging section of this specification.
- 2.2.6.7 Provide all other items as detailed on the drawings.

2.3 Campus Indoor/Outdoor Fiber Optic Feed Cable

- 2.3.1 Provide one continuous fiber optic cable routed from the Main Distribution Frame fiber patch panel to each Intermediate Distribution Frame fiber patch panel, and/or other locations as shown on the drawings.
- 2.3.2 Fiber optic cable shall be rated for indoor/outdoor and riser applications. Construction shall consist of; all dielectric, indoor/outdoor Riser Rated Tight Buffer Style, flame retardant PVC or PE jacket, rated OFNR, Outer and Inner Layer of Dielectric Strength Yarns with central member constructed of Dielectric Strength Yarns, dry water-blocking compound, and blank fillers as required. Fiber shall be small form factor type fiber for use in existing conduit and pathways and shall not exceed an Overall Outside Diameter (OD) of .350". Central tube or loose tube type fiber will not be considered equal
- 2.3.3 Provide 24-strand multimode fiber feed cable, as shown on the riser diagram, to the IDF location from the existing MDF Room on campus. Feed cables shall be clearly defined and labeled per the detail drawings. Additional labeling on the fiber optic patch panel is required to identify which system the feed cable is servicing.
- 2.3.4 Cable shall contain one or all types of fibers listed below:
 - 2.3.4.1 Provide Multimode 50/125 micron fiber optic glass, (minimum OM4 laser-optimized grade) for dual mode operation at 850 nm and 1300 nm wave lengths. Maximum attenuation at 3.0dB/km @ 850nm and 1.0dB/km @ 1310nm. Quantity of fibers as per detail drawings. Minimum gigabit Ethernet distance guarantee of 1100 meters @ 850nm and 600 meters @ 1300nm. Minimum 10 gigabit Ethernet distance guarantee of 550 meters @ 850nm/1300nm. Fiber shall be ISO-TIA Standard OM4 rated.
 - 2.3.4.2 Refer to drawings for cable types required. Refer to acceptable cables section for additional information and approved manufacturers.
- 2.3.5 Each fiber optic cable shall contain the quantity of strands of optical fibers as detailed on the drawings. **A pull string shall be placed with all fiber cable at the time of installation. Outdoor rated fiber runs in excess of 150 feet shall be provided with a minimum 1/4" pull rope for future access. All empty and spare site conduits shall be provided with a minimum 1/4" pull rope for future access.**
- 2.3.6 All fibers in a multi-fiber cable shall be fully operational within the required performance characteristics. If any individual fiber does not meet the minimum standards, the entire cable must be replaced, end to end, including connectors, without any additional expense to the customer.

2.3.7 Acceptable cables shall be:

Commscope brands Cat6A

Above glass types are an example of product names per manufacturer. Confirm requirements for indoor/outdoor fiber cable with riser drawings and site plans. Part numbers for composite style cable will vary greatly. Confirm part numbers with manufacturer.

2.4 Voice/Data/IP Page Station Cable

2.4.1 Provide one Augmented Category-6, 4-pair, unshielded twisted pair (UTP) cable from the nearest IDF to each RJ45 data outlet port indicated on the drawings. Dual port outlets will require two such cables. Four port outlets will require four cables. All UTP cable shall be blue in color. Contractor shall be responsible for providing the correct color per the drawings.

2.4.2 Augmented Category 6 cables shall be copper wire, individually insulated and color coded.

2.4.3 The cables shall be UL or ETL rated and UL verified in compliance with proposed Category-6A.

2.4.4 The cables shall be UL or ETL rated and UL verified in compliance with proposed Category-6A.

Commscope brands Cat6A

2.5 IDF to MDF Voice Feed Cables

2.5.1 Provide multi-pair UTP Category 5e cable from each IDF to the MDF as indicated on drawings. Cable must be 24 AWG, 22 AWG will not be approved as an acceptable equal.

2.5.2 For voice feed cables, terminate all pairs on 66-type termination blocks in the IDF closet and on 110-Type termination blocks at the MDF Room. Follow standard voice color codes for termination.

2.5.3 All voice feed cables will be tagged on the incoming cable with a typed permanent label with information as to its origin, house pair count, and cable destination. All 66-type blocks shall be labeled with type written labels that fit between the termination blocks (e.g., clear snap-on covers, adhesive labels and holders). Pairs shall be identified a minimum of every 5 pair on the block.

2.5.4 Provide distribution rings for the 110-type blocks mounted at the MDF location.

- 2.5.5 In the IDF closet, the voice feed cable shall be spliced through directly to the patch panel in the equipment rack. See the drawing details for additional requirements.
- 2.5.6 Ground and bond feed cables at one end of cable to aluminum shield with approved "bullet bond" type ground lug and #10 AWG green ground wire. Connect ground wire to closet ground buss bar.
- 2.5.7 Acceptable manufacturers shall be: General Cable or Essex #ARMM type Series for indoor riser cable applications.
- 2.5.8 Acceptable manufacturers shall be General Cable #ANMW type or Superior Essex Sealpic series for outdoor cable applications.

Maximum cable outside diameters shall be as follows:

25 Pair–	.61 in.
50 Pair–	.77 in.
100 Pair –	.99 in.
200 Pair–	1.29 in.

- 2.5.9 Data contractor is responsible for providing the telephone equipment vendor with detailed feed cable documentation as well as identifying all of the physical cable in the MDF and IDF locations. **Contractor shall have all installation, termination and documentation of voice feed cable completed, and released to the telephone equipment vendor, a minimum of three weeks prior to the cut-over date set by the District.**
- 2.5.10 Data contractor is responsible for testing port connectivity from the punch blocks in the IDF closets to the main feed cable blocks in the MDF Room. Test all pairs for continuity and polarity. **All testing must be completed a minimum of three weeks prior to the cut-over date set by the District.**

2.6 Voice/Data/IP Speaker Outlets

- 2.6.1 Unshielded twisted pair data outlets shall be an RJ45 Enhanced performance type 8-position / 8 conductor modular jacks, single port, dual port, four port or quantity as indicated on the floor plans. All outlets shall be wired in an EIA/TIA 568B configuration. All "ACO" type outlets shall comply with Category-6 performance requirements and all "110-Connect" type outlet inserts shall comply with Augmented Category-6 performance requirements.
- 2.6.2 Provide "ACO" edge connector type installation kits and inserts for all voice/data locations, with the exception of the wall mount telephone outlets. The data locations that are routed to the IP Cameras, IP Clock/Speakers, Wireless Access Points and LCD/Audio-Visual data locations shall be provided with 110-Connect modular termination inserts and faceplates.

- 2.6.3 All fax/modem locations shall be provided as data outlets. Requirements shall be the same as a single port data outlet as shown on the Technology Legend.
- 2.6.4 For single port voice outlet locations intended for wall telephone connections, a wall telephone type faceplate with attachment studs shall be provided. The wall telephone jack shall be 8-pin, RJ45 type and use IDC wire terminations only. Provide SYSTIMAX GigaSPEED X10D® Series Category-6A insert, white in color, Part # 760092429 within stainless steel wall plate faceplate Part # 1-OE-A5-PHONE-DP. Screw terminal type jacks will not be accepted as an alternative.
- 2.6.5 IP Clock/Speakers - Provide SYSTIMAX GigaSPEED X10D® Series, single port, small surface mounted box Part # 1116697-1, in ivory, for IP Clock/Speaker data outlets. Provide one, gray, 110 SL series Category-6A insert, Part # 760092437 with strain relief cap, in faceplate for IP Clock/Speaker data locations. Mount data outlet in back of IP Speaker enclosure.
- 2.6.6 LCD/Audio-Visual - Provide SYSTIMAX GigaSPEED X10D® Series, Dual port faceplate, in white, for Audio-Visual data outlets. Provide yellow, SL series Category-6A insert, Part # 760092387 with strain relief cap, in faceplate for Audio-Visual data locations. Mount data outlets as shown on the floor plans and details.
- 2.6.7 Wireless Access Points - Provide SYSTIMAX GigaSPEED X10D® Series, Dual port faceplate, in ivory, for Wireless Access Point data outlets. Provide black, SL series Category-6A insert, Part # 760092361 with strain relief cap, in faceplate for Wireless data locations. Mount data outlets as shown on the floor plans and details.
- 2.6.8 IP Cameras - Provide SYSTIMAX GigaSPEED X10D® Series, no faceplate, for IP Camera data outlets. Provide Red, SL series Category-6A insert, Part # 760092379 with strain relief cap, in faceplate for Wireless data locations. Mount data outlets as shown on the floor plans and details.
- 2.6.9 For single port data outlet locations, the faceplates shall have space for two connections with one port fully operational for connection to all of the specified protocols. The second port shall be covered by a blank plate.
- 2.6.10 For dual port data outlet locations, the faceplates shall have space for two connections with both ports fully operational for connection to all of the specified protocols.
- 2.6.11 For triple port data outlet the faceplates shall have space for four connections with three ports fully operational for connection to all of the specified protocols. The fourth port shall be covered by a blank plate.

- 2.6.12 For quad port data outlet the faceplates shall have space for four connections with all four ports fully operational for connection to all of the specified protocols.
- 2.6.13 All data outlet faceplates shall be electrical ivory in color and shall have a unique sequential identification number applied to faceplate. Hand written labels are not permitted. Faceplates, with the exception of wall telephone outlets and IP Speakers shall include label windows. All color schemes shall be approved by the customer prior to installation.
- 2.6.14 **Colored inserts are required for this project. Refer to the detail drawings for the exact color scheme to be provided. Inserts submitted that do not follow the color and identification requirements will be rejected. Inserts installed that do not follow the color coding as shown in the detail drawings will be replaced at the Contractor's expense.**
- 2.6.15 **All labels will be installed under label windows with the exception of IP Speakers and wall telephone outlets. Labels adhered to the surface of the faceplate will not be accepted unless as shown as an exception above.** Contractor must provide clear laminating type of cover material over the surface mounted labels where used.
- 2.6.16 Reference the drawings for special outlet configurations or plate requirements

2.7 Paging Speakers and Horns

- 2.7.1 The IP- and analog based intercom speakers and horns are existing and shall be protected in place. New analog and digital cabling shall be ran to the all speakers by the Contractor.
- 2.7.2 All exterior loudspeaker circuits shall operate balanced to ground. Bonding shall be provided to assure equal potential measurement between the chassis of all amplifiers, power supplies, etc. Bond to the ground bus bar.
- 2.7.3 Each exterior horn location cable shall be home run to the IDF rack/cabinet. Provide 1-pair, 18 gauge CMR rated speaker cable to each horn location. Terminate speaker cable on terminal strips or punch blocks.
- 2.7.4 Provide a (2) foot long, CAT-6, UTP patch cord, gray in color, for each speaker location to connect to the ethernet drop located in the enclosure. Provide patch cords for 100% of IP Speaker/clock locations. Provide (3) spare patch cords, deliver all Patch cords to the District IT Department.
- 2.7.5 IP speakers/clock and horns shall be connected to the powered ethernet switch in the IDF Room or cabinet. Provide 4-foot long, Category-6 UTP patch cords, gray in color. Provide patch cords for 100% of IP Speaker/horn/zone controller

locations. Provide (3) spare patch cords, deliver all patch cords to the District IT Department.

- 2.7.6 All speaker/clock connections to be terminated at the data patch panel. Speakers must be patched to a powered switch in the IDF to allow for proper operation.
- 2.7.7 Contractor shall be responsible for testing all paging speakers and horns and insuring the proper volume levels are set on the paging devices and amplifiers. Provide (4) man hours (not including travel time) for re-adjustment of the paging speakers and horns volume levels per the District's requirements 4 weeks from the final sign-off of the modernization project. Travel time to and from the site shall be included in the service.

PART 3 - INSTALLATION

- 3.1 Upon completion of 10% of the cabling installation, the contractor shall notify the engineer for an inspection of the methods and types of materials used on the project. The contractor shall give a minimum of 72 hours notification to the engineer for the inspection. The contractor will be given a written review of the findings, so if adjustments are required, they can be done before the project proceeds.
- 3.2 Pull strings will be provided with all cable runs including but not limited to; conduit stub ups, conduit sleeves, cable trays, open wiring routes, innerduct, and point-to-point conduits. Pull strings shall be free from cable bundles in open wiring routes. Pull strings shall not be substituted for pull ropes.
- 3.3 Velcro cable management straps are required on all Category-6 cable bundles, the last 20 feet or upon entry into equipment closet, a maximum of 12" apart. Cable bundles shall also be routed through cable management or "D" rings in the equipment closet.
- 3.4 Data contractor shall supply protective bushings or slide on rings at the ends of all exposed conduits used for the data system cabling. This is to include all conduits installed for any future data cabling requirements. Contractor shall submit planned protection bushing prior to installation of cabling for approval.
- 3.5 Velcro cable management straps are required on the rear of the equipment racks and on the patch cords within the vertical cable managers. Straps shall be a maximum of 12" apart.
- 3.6 Every fiber in every fiber optic cable must be terminated at both ends on a fiber patch panel in the IDF closet or on a faceplate in the classroom location. Termination shall be accomplished using Duplex SC type connectors with a long strain relief boot, except for fiber ran to station locations where a short boot shall be used.

- 3.7 All SC connectors shall be of the same manufacture to ensure compatibility. Polarity of fiber strands must be observed at all times.
- 3.8 Labeling
- 3.8.1 Each cable **run shall be permanently labeled at each end** with a unique sequential number which corresponds to a similar number provided for each data outlet and punch down point. A printed label shall be placed at each of the following locations;
- 3.8.1.1 On the cable at the rear of the patch panel or termination block. Requires the use of a self laminating wrap around label. Brady Label self laminating 1.2" by 1.5" wrap around label Part # 29689 (**NO ACCEPTABLE EQUAL**).
- 3.8.1.2 On each cable in the j-box behind the faceplate location. Requires the use of a self laminating wrap around label. Brady Label self laminating 1.2" by 1.5" wrap around label Part # 29689 (**NO ACCEPTABLE EQUAL**).
- 3.8.1.3 On the face of the patch panel, provide a 3/4" by 3/4" label with a letter or number identifying the patch panel designation.
- 3.8.1.4 On the face of the faceplate in the label holder window.
- 3.8.2 Hand written labels are not permitted. Where cable ID includes room number identification the contractor shall obtain written verification of actual room numbers prior to beginning labeling (numbers on plans do not always match actual room numbers). Cable pulling cross reference lists will not be accepted with final documentation.
- 3.8.3 Each patch panel port shall be identified with a unique sequential labeling scheme. Port identification labeling pattern shall be consistent throughout the project.
- 3.8.4 All faceplates shall be identified with permanent printed labels. Labels must not be subject to removal by incidental contact. Contractor shall be responsible for replacing defective labeling for a period of one year from date of final sign-off of project.
- 3.8.5 All fiber optic and UTP feed cables shall be identified with a permanent, water resistant, printed labels. Labeling information shall include closet identifications, quantity of conductors (UTP) or strands (fiber) and house pair designations (UTP). Cables shall be labeled at the following locations in the IDF/MDF; at conduit entrance point and prior to entering either punch blocks or patch panels. See details for additional requirements.

- 3.8.6 Labeling will follow recommended EIA/TIA standards or as requested by the customer. Contractor will confirm labeling pattern prior to final identification or testing. All test results will be identified by the final labeling scheme.
- 3.8.7 All fiber optic cables and/or innerduct shall be tagged with fiber optic warning tags in every manhole or pullbox. Fiber warning tags shall also be placed at each end of the cable in the termination closets in clear view. A minimum of (3) tags are required at each end. Fiber warning tags shall be placed on fiber optic cable and/or innerduct routed through open ceiling environments at increments no less than 15 feet apart.
- 3.8.8 Refer to detail drawings for additional labeling requirements.
- 3.9 Where open wiring cables are run through the ceiling space (only permitted where specifically noted on the drawings), the wire shall be bundled together and supported above the ceiling.
- 3.10 All cables must be fastened to the building structure via “j-hooks” or an approved Category 6A suspension system, and not directly in contact with ceiling system. For “j-hooks” maximum fill capacity is as follows: 1-5/16" hooks – 35 cables; 2" hooks - 60 cables; 4" hooks - 120 cables. For quantities beyond 120 cables use a sling support system such as “Erico Cable Cat” or equal. Maximum fill capacity 200 cables. D-rings, “Caddy #WMX cable hangar”, “Caddy Bridle Rings”, drive rings or any other type of wire ring support is not allowed.
- 3.11 Where cables pass through a fire-resistant portion of the structure, conduit sleeves shall be provided to maintain the rating of the wall penetrated. Sealing of all penetrations with an approved fire barrier is required. Conduits and sleeves must remain accessible for future use. Permanent sealants may not be used to seal sleeves and conduits.
- 3.12 Fiber optic cables connecting to equipment racks shall be installed with not less than 20 feet of slack cable between the rack and the terminal backboard. See drawings for fiber optic service loop requirements.
- 3.13 Provide 6 inches of cable slack at computer data system outlets inside conduit box.
- 3.14 In an accessible ceiling area, provide a 10 foot (circle 8 configuration) service loop above the data/voice outlet locations. Service loop must be tied up off of ceiling tiles or ceiling surface. Neatly coil cable without exceeding minimum bend radius limitations. Do not provide length in excess of 15 feet. May cause improper test results.
- 3.15 The minimum bending radius for all cables and the maximum pulling tension shall not exceed manufacturer's recommendations.
- 3.16 Cables installed in manholes and pullboxes on terminal backboards shall be installed on wall mounted cable support racks.

- 3.17 Provide a full 360 degree loop of cable around manhole and pullbox interiors.
- 3.18 Cable pulling shall use a split mesh grip over the cable jacket. Connection directly to optical fibers and copper wire conductors shall not occur.
- 3.19 When pulled through conduits, cable pulling lubricants shall be continuously applied to all cables and be specifically approved by the manufacturer.
- 3.20 Where cables are pulled through or pulled from a center of run, pull without splices or terminations, lead out the cables at all manholes, pullboxes, and conduits, taking care to feed them in again by hand for the next run.
- 3.21 For each cable pull where a cable direction change is required, flexible feed-in tubes, pullout devices, multi-segmented sheaves, etc., shall be used to ensure proper cable pulling tensions and side wall pressures. Cables shall not be pulled directly around a short right angle bend. Any device or surface the cable comes in contact with when under pull-in tension shall have a minimum radius 50% greater than the final specified minimum installed cable bending radius. The maximum possible size radius sheaves and feed-in tubes, usable in the available working space, shall be provided in all situations, to ensure the minimum possible cable sidewall pulling pressure. Do not use devices with multi-segment "roller" type sheaves.
- 3.22 Cable lengths over 250 feet shall be machine pulled, not hand pulled. Cables shall be pulled in a continuous, smooth operation without jerking or stop-start motion after initiation of pull. Maximum cable pulling speed shall be less than 50 feet per minute. Minimum pulling speed shall be greater than 15 feet per minute.
- 3.23 When pulling cable through conduit, cables shall be pulled straight into or out of the raceway without bends at the raceway entrance or exit. Pull in cable from the end having the sharpest bend (i.e., bend shall be closest to the reel.) Keep pulling tension to minimum by liberal use of lubricant, hand turning of reel, and slack feeding of cable into duct entrance. Employ not less than one man at reel and one at manhole or pullbox during this operation. Cables shall be pulled directly from cable reels.
- 3.24 All cables shall be new and extend continuous from each MDF or IDF backboard or rack to all voice/data outlets or other equipment locations.
- 3.25 Where cables are not installed in a conduit or other raceway system, they shall not be routed parallel with other line voltage equipment or wiring (120 volt and above) within 36" or within 12" of line voltage equipment or wiring where crossing. Where Flooded Enhanced Category-5 cables or outdoor rated fiber optic cables are routed exposed through ceilings for more than 50'-0", install in innerduct or EMT conduit system.

PART 4 - TESTING

- 4.1 All Category-6A cables shall be point to point (link) tested after installation/termination and verified to operate at minimum 1000Mbps. Performance of installed cables shall satisfy all current addendums to the EIA/TIA 568A standard for Category-6A wiring. In addition, testing shall satisfy all proposed amendments to the existing ISO/IEC requirements. The wiring shall support all specified communication protocols. Testing shall support the Category-6A requirements by the EIA/TIA.
- 4.2 Upon completion of testing cable links, the Contractor shall supply a copy of the original database files downloaded from the tester in original format on disk. Contractor shall provide with database files an original copy of the tester's manufacturer software program (included in original cost) for record management and archiving, in a Windows format (e.g., MicroTest's software program - ScanLink ver.)
 - 4.2.1 10 PC for Windows, WaveTek's software program-LTRM ver.1.07, etc). The manufacturer's software program will be used by the engineer to review all test results, and then turned over to the customer to keep as their record copy with the final approved test results. Provide (3) copies of tests on disk.
- 4.3 Contractor will repair or replace cable runs or connecting hardware that do not meet specified criteria.
- 4.4 Multimode fiber optic cables shall be tested bi-directionally at 850nm and 1300nm. Single mode fiber optic cable shall be tested bi-directionally at 1310nm and 1550nm. All fiber strands shall be tested with a power meter and light source as well as an OTDR (Optical Time Domain Reflectometer). OTDR fiber tests for runs under 100 meters are not required. All fiber test results shall contain final source and destination information that matches IDF or MDF labeling shown on drawings. Fiber test results shall be submitted as hard copy and on floppy disk in Microsoft Excel format.
- 4.5 Test procedures shall comply with EIA/TIA 526-14 Method B. Test results shall meet the minimum following criteria:
 - 4.5.1 Fiber optic test results shall not exceed 2db attenuation loss in addition to inherent loss published by manufacturer tested at minimum 2000 Mhz for 850nm and 500 Mhz for 1300nm for the fiber optic cable.
 - 4.5.2 Test all voice/data cables minimum Category-6A UTP cable to test results for "Link Testing" requirements @ 250 Mhz per current EIA/TIA draft requirements. Any cables which do not meet these minimum requirements shall be replaced or repaired at no cost to the customer.
- 4.6 End to end attenuation termination points measure the power loss between end points from both directions.
- 4.7 End to end attenuation testing shall be performed with a temporary test jumper cable at each end of the installed fiber cable. The test jumper shall be the same size as the

installed cable. The measured attenuation of the test jumpers, test connectors, and test interconnection sleeve between the two test jumpers shall be less than 1dB as calibrated at the time of the test at indicated wave lengths and frequencies.

- 4.8 Provide (3) hard bound copies of “E-size” drawings and (1) file copy in AutoCAD format copy of floor plan drawings of each building on a USB flash drive. These drawings shall include all outlet locations, major cable routes and outlet and cable identification numbers. Provide detailed elevations of each MDF or IDF locating all equipment and connections.

END OF SECTION

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SECTION 27 20 00
INTEGRATED AUDIO/VISUAL SYSTEM

PART 1 – GENERAL

SUMMARY

- 1.1 The Contractor shall furnish all labor, project management, materials, tools, equipment, and resources necessary for the installation, startup, and testing of the system shown on the plans and described in the specifications.
- 1.2 Related Specification Sections:
 - 1.2.1 Section 26 01 00 -General Provisions
 - 1.2.2 Section 26 05 33 -Conduit and Fitting
 - 1.2.3 Section 26 05 19 -Conductors
 - 1.2.4 Section 26 05 34 -Outlet and Junction Boxes
- 1.3 The Contractor shall furnish and install the system as defined by the plans and specifications. The Contractor must demonstrate to the Owner that the system is complete and complies with all operational requirements set forth in the plans and specifications.
- 1.4 The work covered under this section of the specifications consists of furnishing all labor, equipment, supplies and materials, and in performing all operations necessary for the turnkey and fully completed installation of an audio/ video system in accordance with the specifications and accompanying drawings, except as specifically noted otherwise.
- 1.5 Cables for the system shall be pulled through the conduit systems furnished by the building contractor. The 27 20 00 Contractor shall be responsible for providing all cables required and for coordinating and supervising the cable installation. The 27 20 00 Contractor shall be responsible for ensuring the integrity of the cables before and after installation.
- 1.6 Work Excluded:
 - 1.6.1 Excluded from this work shall be any and all general construction services regarding masonry and general carpentry services. Those services are to be provided and installed by the general contractor.
 - 1.6.2 Conduit/raceways, sleeves, cable trays, electrical boxes, hand holes, pullboxes, etc. required for the system shall be furnished and installed by the Electrical Contractor. The conduit/raceways and electrical boxes furnished and installed under Electrical Contractor shall conform with the requirements of the drawings and specifications for the system.

- 1.7 In order to ensure project cohesion a single point of contact is required to provide a "TURNKEY" solution. The work covered under this section of the specification consists of furnishing all labor; cabling; equipment; software; supplies; materials and training. The contractor will perform all operations necessary for the "TURNKEY" and fully completed installation in accordance with the specifications herein. As such, the successful contractor must be factory trained on all aspects of system hardware. The successful contractor shall be a California licensed C7 or 10 premise wiring contractor as defined in this specification. Subcontractors may not be utilized in the implementation of the plant wiring installation.
- 1.8 Approval to bid shall not release the Contractor from full specification compliance requirements. Final system acceptance testing shall govern final system acceptance and compliance with the specifications.
- 1.9 Failure to provide a functional equivalent shall result in the removal of the alternate system at the contractor's expense.
- 1.10 These specifications contain statements which may be more definitive or more restrictive than those contained in the General Conditions. Where these statements occur, they shall take precedence over the General Conditions.
- 1.11 Where the words 'provide' or 'provision' is used, it shall be definitely interpreted as 'furnishing and installing complete in operating condition'. Where the words 'as indicated' or 'as shown' are used, it shall mean as shown on contract drawings.
- 1.12 Where items are specified in the singular, this division shall provide the quantity as shown on drawings plus any spares or extras mentioned on drawings or specifications. All specified and supplied equipment shall be new.

DEFINITIONS

- 1.13 Concealed: Hidden from sight, as in trenches, chases, hollow construction, or above furred spaces, hung ceilings - acoustical or plastic type, or exposed to view only in tunnels, attics, shafts, crawl spaces, unfinished spaces, or other areas solely for maintenance and repair.
- 1.14 Exposed, Non-Concealed, Unfinished Space: A room or space that is ordinarily accessible only to building maintenance personnel, a room noted on the 'finish schedule' with exposed and unpainted construction for walls, floors, or ceilings or specifically mentioned as 'unfinished'.
- 1.15 Finish Space: Any space ordinarily visible, including exterior areas.

Contractor Qualifications

- 1.16 The successful bidder shall be a California licensed C7 or C10 premise wiring contractor as defined in this specification. Subcontractors may not be utilized in the implementation of the installation or programming.

- 1.17 The successful bidder shall have design staff with CTS certification and Extron Advanced A/V Certifications.
- 1.18 The successful bidder shall have installation staff with CTS certification and Extron Advanced A/V Certifications.
- 1.19 All bidders must provide a listing of two similar size projects having the same scope of work using the proposed information delivery equipment. This listing shall be complete with facility names, completion dates, names of contacts, and their telephone numbers. Referenced projects must have been completed in the past 18 months.
- 1.20 The bidder shall have a factory trained service department the service department shall be on call 24 hours a day, 365 days a year, to arrive and initiate onsite service the specified equipment upon (24) hours notice.
- 1.21 The Contractor shall employ factory-trained technical/service personnel for service and maintenance of the system. Their résumés will be required. The factory-trained technical/service personnel shall have a minimum of two years experience installing the proposed system. The Bidder shall submit the names and copies of the certificates issued by the factory. The bidder shall instruct the Owner's technical personnel in the operation, care, and maintenance of the system.

CODE COMPLIANCE

- 1.22 All material and equipment shall be clearly listed, labeled, or certified by Underwriters Laboratories, Inc. All power supplies and computers shall be clearly UL Listed. Any system which is not UL Listed at time of bid will be rejected.
- 1.23 All acceptable systems shall be approved under Part 15, Subpart B, Section 15.107b of the FCC Rules and Regulations. Bidders must provide the FCC Registration Number of the proposed system. Systems that are not in compliance with the FCC will not be considered. Any system that is not FCC compliant at time of bid will be rejected. All equipment must be clearly labeled with FCC compliance stickers.
- 1.24 The system shall be installed in accordance with local and national electrical codes.
- 1.25 The manufacturer and contractor shall provide the Owner with a release for use of all copyright materials, corporate logos, and corporate trademarks at time of bid.

SUBMITTALS

- 1.26 Index all submittals and reference to these specifications. All submittal items shall be assembled and submitted in a single complete binder per submittal group. Partial submittals will not be reviewed. Submit items in groups as indicated below: All submittals, warranty information, close - out documents, and as built documents must be submitted independently for owner, in order to provide record documentation for the project owner.

- 1.27 Group # 1 Submittal shall be made within (20) working days after the award of the contract. This submittal shall include the following:
- 1.27.1 Complete bills of quantities, including all materials, components, devices, and equipment required for this work. The bills of quantities shall be tabulated respective of each and every system as specified, and shall contain the following information for each item listed:
 - 1.27.1.1 Quantity of each type of equipment item
 - 1.27.1.2 Description of each item
 - 1.27.1.3 Manufacturer's Name and Model Number
 - 1.27.1.4 Manufacturer's Specification Sheet
 - 1.27.1.5 Equipment items which have individual components will require that all component parts be listed individually.
 - 1.27.1.6 Description of any specialty backbox requirements
 - 1.27.1.7 All wiring types required for installation of this system
 - 1.27.1.8 Copy of equipment warranty
 - 1.27.1.9 Spare parts shall be listed individually to verify proposed quantity
- 1.28 Group # 2 Submittal shall be provided within (20) working days after the approval of the Group # 1 submittals and prior to any fabrication or field conduit installations. All shop drawings shall be engineered and drawn on a CAD System. Contractor shall make the request for drawings in writing directly to Johnson Consulting Engineers, confirmation of the request and a release form will be forwarded to the contractor to include a signed copy with payment prior to release of files. Detail or riser diagram sheets or any other drawings other than floor or site plans, will not be made available to the contractor. Phase II Submittals drawings shall include the following:
- 1.28.1 Furnish complete shop drawings for all systems specified. Each drawing shall have a descriptive title and all sub parts of each drawing shall be completely described. All drawings shall have the name of the project, architect, consultant, and electronics contractor in the title block.
 - 1.28.2 Furnish complete scaled drawings of all equipment racks, consoles, special assemblies, etc. Each drawing shall show all equipment with its manufacturer and model number.
 - 1.28.3 Furnish complete scaled installation drawings detailing locations of all equipment such as control panels, plug panels, video monitors, video projectors, equipment racks, speakers, etc. All conduits with cable quantities and types and all terminal block locations shall be shown also.
 - 1.28.4 Provide single line riser diagrams of all racks, consoles, control panels, speaker assemblies, etc. Each drawing shall delineate circuit numbers for all cables and terminal connections. Provide typical wiring termination for all devices.
- 1.29 All equipment items referenced by manufacturer name and model number shall be the only approved product to be furnished for use on this project. Where alternate items are acceptable (or approved alternate) will be noted with the product description.

- 1.30 Products as manufactured by “Extron” have been specified to coordinate with an existing facility and other contracts to be issued for this project. Alternate products will not be approved.

SEISMIC ANCHORING

- 1.31 All sound systems, A/V equipment or enclosures shall be anchored to the structure. Where details have not been provided on the drawings, anchorage shall comply with CBC Section 1632A and Table 16-A0. The contractor shall submit drawings signed by the contractor’s registered structural engineer indicating method of compliance prior installation.

CLEANUP

- 1.32 In addition to cleanup specified under other sections, thoroughly clean all parts of the equipment. Where exposed parts are to be painted, thoroughly clean off any spattered construction materials and remove all oil and grease spots. Wipe the surface carefully and scrape out all cracks and corners.
- 1.33 Use steel brushes on exposed metal work to carefully remove rust, etc., and leave smooth and clean.
- 1.34 During the progress of the work, keep the premises clean and free of debris.

GENERAL COORDINATION

- 1.35 The A/V drawings may reference components by manufacturer which conflict with the written specification requirements, where this occurs the written specifications shall be followed.

DEMO

- 1.36 Contractor is required to remove all existing AV cabling extending to the projector from the AV cabinet and teaching island in each room. There are existing HDMI, VGA, S-Video, and composite video cabling. Protect projector, mount assembly and the ceiling mounted audio speaker with power supply in place after removing cabling and before the wall construction begins.

PART 2 — PRODUCTS

2.1 Science Building AV Classrooms and Science Lecture

- 2.1.1 The typical classroom will be getting (1) new projection screen for each projector and (2) new HDMI faceplates and HDMI cabling from the teachers LO location to the existing ceiling projector. Contractor will provide an audio return from the projector audio output feeding into a new RDL ST-DA3

- 2.1.2 Line Level Distribution Amplifier - 1x3 . This will split the line level output to (2) channels, one to the existing ceiling speaker and the second channel shall feed the 3.5 mm wallplate for the ALS The existing projector mount and extension pole will remain.
- 2.1.3 Contractor will provide (2) new HDMI cables from each LO location on the floorplans to the projector location. The LO locations will have (2) single decora wallplates containing a single HDMI and (1) 3.5mm audio pass-through plate for return audio for the ALS. All decora plates and covers shall be white in color.
 - 2.1.3.1 Extron wallplate model # WPD 110 A HDMI w/Audio Captive Screw and Control with HDMI Female to HDMI Female connector on 10" pigtail.
 - 2.1.3.2 (2) Extron 4K HDMI 2.0 cable HD Pro Plenum Series HDMI Premium High Speed Optical Cables – HD Pro P/35 or P/50 lengths. Science Lecture locations will require a 50” + cable, field verify length before acquiring (or approved equal by Vanco).
 - 2.1.3.3 (1) 3.5 mm Male to Male Stereo Audio Cable 35’ or 50’ by C2G (or approved equal by Kramer) length will be determined off of actual field condition necessities . This will be connected to the “audio-out” from the projector feeding the wallplate.
 - 2.1.3.4 (1) 3.5mm decora wallplate (pass-through) by Extron model # WPD 101 3.5 mm labeled ‘ALS feed’.
 - 2.1.3.5 (1) RDL ST-DA3 stick-on distribution amplifier, this will be installed inside the existing locking projector mount assembly with the power cable feeding up the projector pole and plugged into the existing power feed above ceiling. Contractor must balance the audio inputs and outputs for proper volume levels.
 - 2.1.3.6 (1) RDL PS-24AS 24 Vdc Switching Power Supply, North American AC Plug, 500 mA, dc Plug
- 2.1.4 Contractor will provide a new wall mounted manual projection screen in each classroom location shown on the plans. Science lecture will have two one for each projector. This will include wall mounting brackets, ‘S’ hooks and all necessary hardware. Anchors will be installed into backing furnished by others. Contractor must coordinate the proper layout for backing with the framing contractor. Screen must be installed to align image from existing projector.
 - 2.1.4.1 Provide (1) Da-Lite Model ‘C’ with CSR projection screen in each classroom space. Wide (16:10) format; 60’ x 90” or 113” diagonal size; Matte White screen surface.
 - 2.1.4.2 Provide (1) pair of Da-Lite screen mounting and extension brackets Da-Lite model # 40932 for each screen installed.

- 2.1.5 The image from the projector must align with the projection screen and fill the new screen image area completely with no keystone correction or quick cornering.

2.2 ALS Systems

- 2.2.1 Provide (4) portable complete ALS systems, (2) floating for Standard Classrooms and (2) for the Science/Lecture area. The existing projectors shall be outfitted with an 'audio output' cable consisting of a 3.5 mm audio cable from the projector to a wall plate adjacent to the teachers LO location in each space. The Contractor shall provide a complete portable, compliant ALS system with all necessary hardware, cabling, wall plates, connectors, and wall placards. Each classroom and assembly area shall have an 'Assistive Listening Devices available' wall plate mounted in a conspicuous area, refer to the Architectural details of the drawings for details on this. The Assistive Listening Systems shall be provided in accordance with CBC Section 11B-219 and shall comply with CBC Section 11B-706.
- 2.2.2 Per ADA Assistive Listening System CBC Section 11B-706.3 – “The minimum number of receivers to be provided shall be equal to 4% of the total number of seats, but in no case less than two. 25% minimum of receivers provided, but no fewer than two, shall be hearing aid compatible. If the system provided is limited to specific areas or seats, then such areas or seats shall be within a 50-foot viewing distance of, and have a complete view of the stage or playing area per CBC Section 11B-219.4
- 2.2.3 For the Science/Lecture area provide (2) FM ADA KIT 37 complete systems consisting of the following:
 - 2.2.3.1 (1) PPA T46 transmitter
 - 2.2.3.2 (4) PPA R37 receivers
 - 2.2.3.3 (4) HED 027 headphones
 - 2.2.3.4 (1) MIC 090 lapel microphone
 - 2.2.3.5 (1) MIC 049 desktop conference mic
 - 2.2.3.6 (1) CCS 029 system carry case
 - 2.2.3.7 (2) NKL 001 neckloops
 - 2.2.3.8 (1) BAT KT6 charger kit
 - 2.2.3.9 (5) BAT 026-2 AA rechargeable batteries
 - 2.2.3.10 (1) CHG 3502 Battery Charger

2.2.3.11 (1) IDP 008 ADA wall plaque-permanently mounted on wall-confirm location with Architect.

2.2.4 For the Standard Classroom areas there will be (2) complete systems shared for these spaces, so each room will receive a permanent wall placard but share (2) FM ADA KIT 37 ALS kits with the following:

2.2.4.1 (1) **IDP 008 ADA wall plaque for each Classroom** permanently mounted on wall (confirm location with Architect).

2.2.4.2 (1) PPA T46 transmitter

2.2.4.3 (4) PPA R37 receivers

2.2.4.4 (4) HED 027 headphones

2.2.4.5 (1) MIC 090 lapel microphone

2.2.4.6 (1) MIC 049 desktop conference mic

2.2.4.7 (1) CCS 029 system carry case

2.2.4.8 (2) NKL 001 neckloops

2.2.4.9 (5) BAT 001-2 AA alkaline batteries

2.3 **Audio/Video Patch Cables**

2.3.1 All patch cables must be factory manufactured. Do not substitute cable assemblies with a different manufacturer than shown in the specifications.

2.3.2 All HDMI cables must be

2.3.2.1 48 Gbps bandwidth

2.3.2.2 Supports resolutions up to 8K@60Hz, 4:4:4 Chroma and 4K@120Hz

2.3.2.3 Enables transmission of High Dynamic Range (HDR) video

2.3.2.4 EMI tested to ensure cables minimize interference with wireless signals

2.3.2.5 Up to 32 audio channels

2.3.2.6 Features Enhanced Audio Return Channel (eARC) for simplified connectivity, greater ease of use and support for the most advanced audio formats and highest audio quality

2.3.2.7 HD Audio Formats such as DTS Master, DTS:X, Dolby TrueHD, Dolby Atmos and more

2.3.2.8 Support for the wide-angle theatrical 21:9 video aspect ratio.

2.3.3 All DisplayPort cables must be:

2.3.3.1 DisplayPort 1.2 compliant

2.3.3.2 4K Verified

2.3.3.3 Supports resolutions to 4096x2160 @ 60 Hz for cable lengths up to 12 feet (3.6m)

2.3.3.4 25 feet (7.6 m) cable supports resolutions to 4096x2160 @ 30 Hz

2.3.3.5 Support video and audio bandwidth up to 21.6 Gbps

2.3.3.6 28 AWG copper wire construction

2.3.4 All stereo audio cables shall be length as required and terminated with the proper connectors to interface with the equipment. Provide Extron "Mini Audio Cables Series", Model A/Mini/XX (XX=length required).

2.3.5 All patch cables shall be provided for each type of connection required to provide a complete and operational system. All patch cables shall be factory manufactured.

Training

2.4 Portable Equipment shall be furnished and spares supplied to the designated representative of the Client, along with complete documentation of the materials provided. Where applicable, deliver portable equipment in the original manufacturer's supplied packaging.

2.5 **Contractor will provide a minimum of 4 clock hours of on-site training for site staff on the Classroom A/V systems.** Training for personnel shall be provided by certified technology specialists. The scope of training shall encompass system operation and procedures. Technician training should include an integrated information overview, media retrieval procedures as well as operation procedures for local control configurations. The contractor shall provide a detailed written outline clearly describing the proposed plan for all training, for approval by the Engineer and Owner's representative.

2.5.1 Training for staff will include basic system concepts. Faculty and staff will need to know how to power on/off the system, and how to access one or more media resources via remote control. Training should include use and operation of audio/video devices and techniques and trouble-shooting tips. Trainers should incorporate hands-on techniques to maximize staff opportunity to incorporate and develop curriculum that is both meaningful and targeted for their student needs. Clearly written support materials should be provided to all training

participants. Manual describing operation and use of the system shall also be provided.

PART 3 - INSTALLATION AND EXECUTION

- 3.1 Verify that all electrical requirements including junction boxes, empty conduit and power circuits and receptacles are in place as shown on the drawings.
- 3.2 Receive, check, unload, handle, store, and adequately protect equipment and materials to be installed as part of the contract. Store in areas as directed by the owner's representative. Include delivery, unloading, setting in place, fastening to walls, floors, ceilings, or other structures where required, interconnecting wiring of system components, equipment alignment and adjustment, and other related work whether or not expressly defined herein.
- 3.3 Installation practices shall follow "standard broadcast wiring" and installation practices, as excerpted from "Recommended Wiring Practices, "Sound System Engineering", (2nd Edition) D. Davis, and Performed to the highest standards of acknowledged industry practices. Upon request the A/V contractor shall furnish all equipment and labor to verify the compliance with the following:

Optical:

- 3.3.1 Center to corner light fall off shall be less than 50% for video/data projectors.
- 3.3.2 Center to corner light fall off shall be less than 35% for optical projectors.
- 3.3.3 Images shall be level and square with the appropriate aspect ratio.
- 3.3.4 Image shall be free from visible vibration.

Audio System:

- 3.3.5 Signal-to-noise ratio (including crosstalk): 55-dB minimum.
- 3.3.6 Total harmonic distortion: 0.1% maximum from 30 Hz to 15,000 Hz.
- 3.3.7 System frequency response: ± 1.0 dB, 20 Hz to 20,000 Hz.
- 3.3.8 Program reproduction system with point-source loudspeakers: Flat response from 63 Hz to 2.5 kHz ± 2 -dB, decreasing uniformly from a relative level of 0-dB at 2.5 kHz to a relative level of -10 -dB at 10 kHz as measured on axis of loudspeaker.
- 3.3.9 Sound output capability: Program levels of not less than 100 dB without objectionable distortion, rattles, or buzzes.
- 3.3.10 Hum and noise is inaudible (below the background noise level of the space) under normal operation and as observed in normal seat locations.

Video System:

- 3.3.11 Signal-to-noise ratio (peak to RMS, unweighted DC to 4.2 MHz): 55-dB minimum.
- 3.3.12 Crosstalk (unweighted DC to 4.2 MHz): 45-dB minimum.
- 3.3.13 Frequency response: ± 0.5 dB to 4.2 Mhz.
- 3.3.14 Line and field tilt: 2% minimum.
- 3.3.15 Differential gain: 3% maximum.
- 3.3.16 Differential phase: 2° maximum.
- 3.3.17 System timing sync coincidence: within 50 nanoseconds.
- 3.3.18 Color timing: $\pm 2^\circ$ at 3.58 Mhz.

Radio Frequency (RF) System:

- 3.3.19 Visual Carrier level: +0 dBmV minimum and +16 dBmV maximum at system outlets for utilized channels.
 - 3.3.20 Adjacent Channel Visual Carrier: 3-dB maximum differential at system outlets.
 - 3.3.21 Non-adjacent Channel Visual Carrier: 0-dB maximum differential at system outlets.
 - 3.3.22 Carrier-to-Noise Ratio: 42-dB minimum
 - 3.3.23 Amplitude Response: Flat ± 1.0 Db
 - 3.3.24 Signal-to-Noise Ratio: 45-dB minimum for the maximum level of the signal and the interference resulting from cross modulation from other signals on the system, after demodulation.
 - 3.3.25 Outlet-to-Outlet Isolation: 25-dB minimum.
- 3.4 Adhere to manufacturer's published specifications for pulling tension, minimum bend radii, and sidewall pressure when installing cables.
 - 3.5 Where manufacturer does not provide bending radius information, minimum bending radius shall be 10 times cable diameter. Arrange and mount equipment and materials in a manner acceptable to the engineer and the owner.
 - 3.6 Attach cables to permanent structure with suitable attachments at intervals of 48 to 60 inches. Support cables installed above removable ceilings. Install adequate support structures for 10 foot cable service loops at each TC.

- 3.7 Mark all cables and patch cords or jumpers with permanent, non-handwritten number or letter cable markers within six inches of both ends. All cables shall be marked. Cable marking codes shall correspond to run sheets.
- 3.8 All faceplates shall be labeled with type-written permanent labels securely attached to the faceplates identifying all A/V connections. (ie; Doc Cam, PC, DVD, etc.) Cables at the projector and A/V switch shall be also be labeled to match the faceplates.
- 3.9 Furnish screw-type terminal blocks, boards, strips or connectors for cables that interface with racks, cabinets, consoles or equipment modules. Attach wires terminating at screw-type terminals with crimp-on lugs. "Telephone-style" punch down blocks are not acceptable for signal or data wiring.
- 3.10 Group cables according to signals being carried. To reduce signal contamination, form separate groups for the following:
 - 3.10.1 Power cables.
 - 3.10.2 Control cables.
 - 3.10.3 Video cables.
 - 3.10.4 Camera cables.
 - 3.10.5 Audio cables for signals less than minus 20 dBm.
 - 3.10.6 Audio cables for signals between minus 20 dBm and plus 30 dBm.
 - 3.10.7 Audio cables for signals above plus 30 dBm.
 - 3.10.8 Broadband RF cables.
- 3.11 Run power cables, control cables, and high level cables on the left side of an equipment rack as viewed frm the back. Run other cables on the right side of an equipment rack.
- 3.12 Cut cables (except video, camera and RGS cables, which must be cut to electrical length) to the length required by the run. All wire and cable shall be continuous and splice-free for the entire length of run. For equipment mounted in drawers or on slides, provide the interconnecting cables with a service loop of appropriate length.
- 3.13 Install no cable with a bend radius less than that recommended by the manufacturer.
- 3.14 Provide strain relief for cables. Provide connectors with metal shell/casings. Provide a minimum of three feet of free cable coiled in a floor pocket. Use spiral wrap to group similar cable types.
- 3.15 All shielded cables shall be insulated. Do not permit shields to contact conduit, raceway, boxes, panels, or equipment enclosures. Tin all terminated shield drain wires and insulate with heat-shrink tubing.
- 3.16 Land all field loudspeaker wiring entering each rack at terminal devices prior to connection to equipment or devices. Land loudspeaker level control cables at screw or tubular clamp type barrier blocks on the left side of the equipment rack as viewed from the rear. Make all connections to screw-type barrier blocks with insulated crimp-on spade lugs. Size all lugs properly to assure low-resistance connections.

- 3.17 Separately dress, route and land microphone and line level cables directly to equipment.
- 3.18 Use only rosin core 60/40 tin/lead solder for all solder connections.
- 3.19 All cables shall be neatly labeled with wrap around type written labels.
 - 3.19.1 On the cable at the rear of the faceplate or termination location at the control location. Requires the use of a self laminating wrap around label. Brady Label self laminating 1.2" by 1.5" wrap around label Part # 29689 (NO ACCEPTABLE EQUAL)
- 3.20 Lace, tie or harness wire or cable in accordance with accepted professional practice. Dress, lace or harness all wire and cable to prevent mechanical stress on electrical connections; no wire or cable shall be supported by a connection point. Provide service loops where harness of different classes cross or where hinged panels are to be interconnected.
- 3.21 Upon completion of the work, remove all refuse and rubbish from and about the premises, and leave the relevant areas and equipment clean and in an operational state.
- 3.22 During the installation, and up to the date of final acceptance, protect finished and unfinished work against damage and loss. In the event of such damage or loss, replace or repair such work at no cost to the owner.
- 3.23 Prior to final acceptance, provide minimum of three complete sets of drawings showing all cable numbers and construction details in accordance with the actual system installation. Revise the device layout drawings to represent actual installation locations and coordinate these with the electrical contractor. The operation manual shall contain all instructions necessary for the proper operation of the installed system and manufacturer's instructions. The maintenance manual shall contain all information required for the "proof of performance" as required and all manufacturers' maintenance information.

Inspection and Test upon Completion

- 3.24 Check out and final connections to the system shall be made by the Contractor of the products installed. Technicians shall demonstrate operation of the complete system and each major component to the Owner.
- 3.25 System field wiring diagrams shall be provided to the owner by the system Installer (Contractor) prior to completion of the installation.
- 3.26 All materials and installation shall be guaranteed to be free of defects in material and workmanship for two years after final acceptance of installation and test.
- 3.27 Upon completion of the installation, four (4) copies of complete operational instructions shall be furnished, complete with record drawings. Instructions shall include part numbers and names, addresses, and telephone numbers of parts source. Final payment shall not be made until operational and maintenance manuals have been received.

- 3.28 The Contractor shall be responsible to provide service within 24 hours (or by mutual consent) after notification by the Owner or his representative, within the hours of 8:00 AM to 5:00 PM from Monday through Friday. Service request forms shall be supplied by the Contractor and the faxing or mailing of such a request form shall constitute notification by the Owner of a service request.
- 3.29 The Contractor shall provide two "preventative maintenance" service calls, spaced six months apart, for cleaning of all source devices and overall inspection of the system.

PROJECT CLOSEOUT

- 3.30 Prior to completion of project, compile a complete equipment maintenance manual for all equipment supplied under sections of this division, in accordance with these specifications and as described below.
- 3.31 Equipment Lists and Maintenance Manuals:
- 3.31.1 Prior to completion of job, contractor shall compile a complete equipment list and maintenance manuals. The equipment list shall include the following items for every piece of material equipment supplied under this section of the specifications:
- 3.31.1.1 Name, model, and manufacturer.
- 3.31.1.2 Complete parts drawings and lists.
- 3.31.1.3 Local supply for parts and replacement and telephone number.
- 3.31.1.4 All tags, inspection slips, instruction packages, etc., removed from equipment as shipped from the factory, properly identified as to the piece of equipment it was taken from.
- 3.32 Maintenance manuals shall be furnished for each applicable section of the specifications and shall be suitably bound with hard covers and shall include all available manufacturers' operating and maintenance instructions, together with "as-built" drawings to properly operate and maintain the equipment. The equipment lists and maintenance manuals shall be submitted in duplicate to the Architect for approval not less than 10 days prior to the completion of the job. The maintenance manuals shall also include the name, address, and phone numbers of all subcontractors involved in any of the work specified herein. Four copies of the maintenance manuals bound in single volumes shall be provided.

RECORD DRAWINGS

- 3.33 The contractor shall maintain record drawings as specified in accordance with these specifications, and as noted below.
- 3.34 Drawings shall show locations of all concealed and exposed conduit runs, giving the number and size of conduit wires. Underground ducts shall be shown with cross section

elevations and shall be dimensioned in relation to permanent structures to indicate their exact location. Drawing changes shall not be identified only with referencing CORs and RFIs, the drawings shall reflect all the actual changes made.

- 3.35 One set of record drawings shall be delivered to the Engineer in accordance with these specifications.

END OF SECTION

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SECTION 32 13 13
SITE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete sidewalks, stair steps, and general site applications.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete.
- B. Section 07 92 00 - Joint Sealants: Sealing joints.

1.03 REFERENCE STANDARDS

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
- B. ACI 301 - Specifications for Structural Concrete.
- C. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
- D. ACI 305R - Guide to Hot Weather Concreting.
- E. ACI 306R - Guide to Cold Weather Concreting.
- F. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.
- G. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- H. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- I. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
- J. ASTM C33/C33M - Standard Specification for Concrete Aggregates.
- K. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- L. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
- M. ASTM C150/C150M - Standard Specification for Portland Cement.
- N. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- O. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
- P. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- Q. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
- R. SSPWC (Greenbook) - Standard Specifications for Public Works Construction.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

- B. Product Data: Provide data on joint filler, admixtures, and curing compound.

1.05 QUALITY ASSURANCE

- A. Lines and Levels: Established by State of California licensed Surveyor or registered Civil Engineer. Costs of surveying services shall be included in the Contract Sum.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.

PART 2 PRODUCTS

2.01 PAVING ASSEMBLIES

- A. Comply with applicable requirements of ACI 301.
- B. Concrete Sidewalks: 4,000 psi 28 day concrete, thickness as indicated on Drawings, minimum 4 inches, natural grey color Portland cement.
- C. Site Concrete: 4,000 psi 28 day concrete, thickness as indicated on Drawings, minimum 4 inches, natural grey color Portland cement.

2.02 REGULATORY REQUIREMENTS:

- A. Conform to California Code of Regulations (CCR), Volume 2, Part 2, Chapters 18A and 19A.
- B. Conform to California Building Code (CBC), Chapter 11B and ADA Standards for accessibility requirements.
 - 1. Portland cement concrete paving shall be stable, firm, and slip resistant and shall comply with CBC Sections 11B-302 and 11B-403.
 - 2. Concrete paving and concrete finishes along accessible routes of travel shall be at least as slip-resistant as that described as a medium salted finish for slopes of less than 6%, and slip resistant at slopes of 6% or greater; CBC 11B-403.2.
 - 3. Accessible routes of travel, walks, paving, and sidewalks, shall have a continuous common surface with minimum width of 48 inches per CBC 11B-403.5.1, not interrupted by steps or by abrupt changes in level.
 - a. CBC 11B-303.2 Vertical: Changes in level exceeding 1/4 inch high maximum shall be permitted to be vertical and without edge treatment.
 - b. CBC 11B-303.3 Beveled: Changes in level between 1/4 inch high minimum and 1/2 inch high maximum shall be beveled with a slope not steeper than 1:2.
 - 4. Surface cross slopes shall not exceed 2 percent on any accessible path of travel.
- C. Albedo Reflectance of Finish Concrete: 0.30, minimum.

2.03 FORM MATERIALS

- A. Wood form material, profiled to suit conditions.
- B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
 - 1. Thickness: 1/2 inch.

2.04 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) yield strength; deformed billet steel bars; unfinished.
- B. Dowels: ASTM A615/A615M, Grade 60 - 60,000 psi yield strength; deformed billet steel bars; unfinished finish.
- C. Provide supports for reinforcement to position the bars at mid depth of the concrete. Plastic and/or steel chairs, and dobies are acceptable.

2.05 CONCRETE MATERIALS

- A. Obtain cementitious materials from same source throughout.
- B. Cement: ASTM C150/C150M, Sulfate Resistant - Type V Portland cement, gray color.
- C. Fine and Coarse Mix Aggregates: ASTM C33/C33M.
- D. Water: Clean, and not detrimental to concrete.
- E. Chemical Admixtures: ASTM C494/C494M, Type A - Water Reducing, Type C - Accelerating, and Type G - Water Reducing, High Range and Retarding.
 - 1. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

2.06 ACCESSORIES

- A. Curing Compound: ASTM C309, Type 1-D, Class A.
 - 1. Comply with all applicable air pollution requirements.
- B. Liquid Surface Sealer:
 - 1. High solids, acrylic curing and sealing compound: Minimum 30% non-yellowing, acrylic solids curing compound; shall conform to ASTM C309 and ASTM C1315, Type I, Class A, VOC compliant.
 - a. Acceptable Products:
 - 1) L&M Construction Chemicals, Inc.; Dress & Seal WB: www.lmcc.com.
 - 2) L.M. Scofield Company; Cureseal-W: www.scofield.com.
 - 3) W. R. Meadows Company; Decra-Seal W/B: www.wrmeadows.com.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.
- C. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
 - 1. Material: Closed-cell, non-absorbent, compressible polymer foam in sheet form.
- D. Tactile Warning Surfaces: See Section 32 17 26.

2.07 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
- D. Concrete Properties:
 - 1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; As scheduled.
 - 2. Water-Cement Ratio: Maximum 40 percent by weight, or according to indicated concrete strength..
 - 3. Maximum Slump: 4 inches.

2.08 MIXING

- A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.02 SUBBASE

- A. See Section 32 11 23 for construction of base course for work of this Section, where indicated on Drawings.

3.03 PREPARATION

- A. Project Conditions:
 - 1. Water and Dust Control: Maintain control of concrete dust and water at all times. Do not allow adjacent planting areas to be contaminated.
- B. Moisten base to minimize absorption of water from fresh concrete.
- C. Notify Architect minimum 24 hours prior to commencement of concreting operations.

3.04 COORDINATION WITH EXISTING CONSTRUCTION

- A. Connection to Existing Construction: Where new concrete is doweled to existing construction, drill holes in existing concrete, insert steel dowels and pack with non-shrinking grout.
- B. Preparation of Existing Concrete: Prepare previously placed concrete by cleaning with steel brush and apply bonding agent in accordance with manufacturer's instructions.

3.05 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.06 REINFORCEMENT

- A. Place reinforcement at midheight of slabs-on-grade.
 - 1. Locate reinforcement to provide required cover by concrete. If not otherwise indicated on Drawings, provide concrete cover in compliance with ACI 318.
 - 2. Reinforcement Supports: Provide load bearing pads under supports or provide precast concrete block bar supports.
- B. Interrupt reinforcement at contraction and expansion joints.
- C. Place dowels to achieve pavement and curb alignment as detailed.
 - 1. Secure tie dowels in place before depositing concrete.
 - 2. Provide No. 3 bars, 18 inch long at 24 inches O.C. for securing dowels where no other reinforcement is provided.

3.07 COLD AND HOT WEATHER CONCRETING

- A. Follow recommendations of ACI 305R when concreting during hot weather.
- B. Follow recommendations of ACI 306R when concreting during cold weather.
- C. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

3.08 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
 - 1. Mixing: If batch plant is within travel time not exceeding maximum limits, transit mix concrete in accordance with ASTM C94/C94M. If travel time exceeds limits, provide alternative means for mixing and submit for review and approval.
- B. Do not place concrete when base surface is wet.
- C. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- D. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.09 JOINTS

- A. Align curb, gutter, and sidewalk joints.
- B. Place 1/2 inch wide expansion joints at 20 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.
 - 1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
 - 2. Secure to resist movement by wet concrete.
 - 3. If expansion joints are not indicated, conform to SSPWC (Greenbook) and standard details and specifications of authorities having jurisdiction.
- C. Provide scored joints.
 - 1. Tooled Joints: 1-inch deep by 3/16-inch wide tooled joints with 1/8-inch radius corners.

2. At 5 feet intervals for pedestrian paving.
 3. At 10 feet intervals for vehicle paving.
 4. Between sidewalks and curbs.
 5. Between curbs and pavement.
- D. Provide keyed joints as indicated.
- E. Saw cut contraction joints 3/16 inch wide at an optimum time after finishing. Cut 1/3 into depth of slab.

3.10 FINISHING

- A. Sidewalk Paving: Medium broom, texture perpendicular to pavement direction with troweled and radiused edge.
- B. Curbs and Gutters: Light broom, texture parallel to pavement direction.
- C. Place sealer on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.11 TOLERANCES

- A. ACI 301, Class B, except paving in public rights-of-way shall conform to SSPWC (Greenbook).
- B. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
- C. Maximum Variation From True Position: 1/4 inch.
- D. Control-joint grooves and other conspicuous lines:
 1. 1/4 inch maximum in any 20 feet.
 2. 1/2 inch maximum in any 40 feet.
- E. Variation in Cross-Sectional Thickness of Slabs:
 1. Minus 1/4 inch.
 2. Plus 1/2 inch.
- F. Variation in Radii
 1. In radii of less than 10 feet:
 - a. 1/8 inch in any 5 feet.
 - b. 1/4 inch in any 10 feet.
 2. In radii of 20 feet:
 - a. 1/4 inch in any 10 feet.
 - b. 3/8 inch in any 20 feet
 3. In radii of 30 feet or more:
 - a. 1/2 inch in any 20 feet.
 - b. 1 inch in any 30 feet.
- G. Coefficient of Friction for Finish Surface:
 1. Pedestrian Vehicular Finish Surface: Minimum 0.6 static coefficient of friction is required for all concrete paving finish surface. All concrete paving surfaces to be broom finish.

2. Ramps: Minimum 0.8 static coefficient of friction is required for all concrete paving finish surfaces on ramps. All concrete paving surfaces on ramps to be broom finish.

3.12 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
 1. Provide free access to concrete operations at project site and cooperate with appointed firm.
 2. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
 3. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
- B. Compressive Strength Tests: ASTM C39/C39M; for each test, mold and cure three concrete test cylinders. Obtain test samples for every 75 cu yd or less of each class of concrete placed.
 1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
 2. Perform one slump test for each set of test cylinders taken.
- C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.13 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
 1. Provide lumber ramping and plywood covering where curbs and gutters are subject to vehicular and equipment traffic during construction.

END OF SECTION

SECTION 32 31 13
CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Posts, rails, and frames.
- B. Wire fabric.
- C. Concrete.
- D. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete anchorage for posts.
- B. Section 08 71 00 - Door Hardware: Gate locking device.

1.03 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- C. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
- D. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- E. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
- F. ASTM F567 - Standard Practice for Installation of Chain-Link Fence.
- G. ASTM F626 - Standard Specification for Fence Fittings.
- H. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework.
- I. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
- J. CLFMI CLF 2445 - Product Manual - Drawings.
- K. CLFMI CLF-FIG0111 - Field Inspection Guide.
- L. CLFMI CLF-PM0610 - Product Manual.
- M. CLFMI CLF-SFR0111 - Security Fencing Recommendations.
- N. CLFMI WLG 2445 - Chain Link Fence Wind Load Guide for the Selection of Line Post and Line Post Spacing.
- O. FS RR-F-191/1D - Fencing, Wire and Post Metal (Chain-Link Fence Fabric).

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

- B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.
- C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.
- D. Samples: Submit two samples of fence fabric, slat infill, 12 inch by 12 inch in size illustrating construction and colored finish.
- E. Manufacturer's Installation Instructions: Indicate installation requirements, post foundation anchor bolt templates, and accessories.
- F. Manufacturer's Qualification Statement.
- G. Fence Installer Qualification Statement.
- H. Field Inspection Records: Provide installation inspection records that include post settings, framework, fabric, barbed wire, fittings and accessories, gates, and workmanship.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Fence Installer: Company with demonstrated successful experience installing similar projects and products, with not less than five years of documented experience.

1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty for gate hardware.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Chain Link Fences and Gates:
 1. Master-Halco, Inc: www.masterhalco.com/#sle.
 2. Merchants Metals: www.merchantsmetals.com/#sle.
 3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 COMPONENTS

- A. Sizes to be determined by fencing manufacturer for wind load of fencing with "tennis court" windscreen and design wind speed of 105 mph. Comply with CLFMI WLG 2445. The following sizes and those listed on the Drawings are minimum.
- B. Line Posts at 6 ft. height: 2.88 inch outside diameter pipe, schedule 40, Group 1A.
- C. Line Posts at 8 ft. height: 3.5 inch outside diameter pipe, schedule 40, Group 1A.
- D. Corner and Terminal Posts, at 6 ft. height: 2.88 inch outside diameter pipe, schedule 40, Group 1A.
- E. Corner and Terminal Posts, at 8 ft. height: 3.5 inch outside diameter pipe, schedule 40, Group 1A.

- F. Gate Posts, at 8 ft. height: 4-1/2 inch outside diameter pipe, schedule 40, Group 1A.
 - 1. Provide posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths.
 - a. Comply with CLFMI CLF 2445 published standards.
- G. Top and Brace Rail: 1.66 inch diameter, plain end, sleeve coupled.
- H. Bottom Rail: 1.66 inch diameter, plain end, sleeve coupled.
- I. Fabric: 1-3/4 inch diamond mesh interwoven wire, 11 gauge, 0.1205 inch thick, top selvage knuckle end closed, bottom selvage knuckle end closed.
- J. Tension Wire: 6 gauge, 0.1920 inch thick steel, single strand.
- K. Tension Bar: 3/16 by 3/4 inch thick steel.
- L. Tension Band: 12 gauge, 0.105 inch thick steel.
- M. Tension Strap: 12 gauge, 0.105 inch thick steel.
- N. Tie Wire: Aluminum alloy steel wire.

2.03 MATERIALS

- A. Posts, Rails, and Frames:
 - 1. ASTM A1011/A1011M, Designation SS; hot-rolled steel strip, cold formed to pipe configuration, longitudinally welded construction, minimum yield strength of 50 ksi; zinc coating complying with ASTM F1043 and ASTM F1083.
 - 2. Line Posts: Type I round in accordance with FS RR-F-191/1D.
 - 3. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round in accordance with FS RR-F-191/1D.
 - 4. Comply with CLFMI CLF-PM0610.
- B. Wire Fabric:
 - 1. ASTM A392 zinc coated steel chain link fabric.
 - 2. Comply with CLFMI CLF-PM0610.
- C. Concrete:
 - 1. Ready-mixed, complying with ASTM C94/C94M; normal Portland cement; 2,500 psi strength at 28 days, 3 inch slump; 3/4 inch nominal size aggregate.

2.04 ACCESSORIES

- A. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.
- B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; steel.
- C. Other Fencing Accessories: Provide other pressed steel or cast iron accessories and fencing items necessary for a complete installation as required by Project conditions and as recommended by fencing manufacturer.

2.05 FINISHES

- A. Components (Other than Fabric): Galvanized in accordance with ASTM A123/A123M, at 1.7 ounces per square foot.

- B. Hardware: Hot-dip galvanized to weight required by ASTM A153/A153M.
- C. Accessories: Same finish as framing.
- D. Color(s): To be selected by Architect from manufacturer's standard range.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Verify that areas are clear of obstructions or debris.

3.02 PREPARATION

- A. Removal: Obstructions or debris.
- B. Excavation: Excavate line post holes as indicated on Drawings.
 - 1. Provide footing depths as indicated on Drawings and conforming to CLFMI published standards, based on fabric height, wind pressure and soil types.

3.03 INSTALLATION

- A. Install framework, fabric, accessories and gates in accordance with ASTM F567.
- B. Place fabric on outside of posts and rails.
- C. Set intermediate posts plumb, in concrete footings with top of footing 2 inches above finish grade. Slope top of concrete for water runoff.
- D. Line Post Footing Depth Below Finish Grade: ASTM F567.
- E. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: ASTM F567.
- F. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail one bay from end and gate posts.
- G. Provide top rail through line post tops and splice with 6 inch long rail sleeves.
 - 1. Connect ends with sleeves forming a rigid connection, allow for expansion and contraction.
- H. Install center brace rail on corner gate leaves.
 - 1. Center Rails: Install mid rails between line posts and attach to post using rail end or line rail clamps.
- I. Bottom Rails: Install bottom rails between posts and attach to post using rail end or line rail clamps
- J. Do not stretch fabric until concrete foundation has cured 28 days.
- K. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.
 - 1. Tighten hardware, fasteners, and accessories.
 - 2. Bend ends of tie wires to preclude snagging.
- L. Position bottom of fabric 2 inches above finished grade.
- M. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.
- N. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Position: 1 inch.
- C. Do not infringe on adjacent property lines.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Layout: Verify that fence installation markings are accurate to design, paying attention to gate locations, underground utilities, and property lines.
- C. Post Settings: Randomly inspect three locations against design for:
 - 1. Hole diameter.
 - 2. Hole depth.
 - 3. Hole spacing.
- D. Fence Height: Randomly measure fence height at three locations or at areas that appear out of compliance with design.
- E. Workmanship: Verify neat installation free of defects. See CLFMI CLF-FIG0111 for field inspection guidance.

3.06 CLEANING

- A. Leave immediate work area neat at end of each work day.
- B. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.
- C. Clean fence with mild household detergent and clean water rinse well.
- D. Remove mortar from exposed posts and other fencing material using a 10 percent solution of muriatic acid followed immediately by several rinses with clean water.
- E. Touch up scratched surfaces using materials recommended by manufacturer. Match touched-up paint color to factory-applied finish.
- F. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

3.07 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

END OF SECTION

Job Walk Sign-in Sheets and DVBE Advertisements



WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2447 DEMOLITION & ABATEMENT – BP 01
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
Miltco	Richard Owen	B	619 248 3361	R.BOWEN1940@ymail.com
JANUS CORP	JERRY LAMAS	C20, C21 ASB, HAZ	760 598-7374	JERRY@JANUSCORP.COM
Class Construction	Dan Stokk	A, B, C22 C21 ASD/HAZ	619-340-4440	estimator@ ClassConstruction.com
CASPER COMPANY	GREG CASPER	A, ASB, HAZ C21, C61	619-247-7746	GREG@CASPERCOMPANY.COM
Gem Industrial Inc	Doug MacLachlan	A, B, C10, C27	658-486-1758	Info@GemIndustrialInc.com
ECT	Tom Entwistle	ASB C21/22	762-732-9429	tom@ecgcorp.net
Resource Environmental Integrated Demolition & Remediation Inc	Chase Tinsley	AB C21/22	(562) 468-7000	Bids@resource-env.com
	JAY GANDHI	A B C21 CL	714.483.1534	JAY@IDREMA.COM

	COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
	Conan Construction	Adrienne Jesse	BLB	760 701-2520	estimating@ conanconstruction.com
	T3 Contractors Corp	Tedd Thompson	C1/2A	(951) 977- 9910	ted@ t3contractors.com
	Nexgen Building Group	Sosh Kueber	A+B	619-670-4460	estimating@ nexgenbuilding.com
	Fordyce Construction, Inc	Brian Fordyce	A+B	619-449-4272	admin@fordyceconstruction.com
	Renewage	Anthony Flores	A-B-C10-C36	424 258 7716	Bidding@renewage.com



WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2448 LANDSCAPE – BP 02
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

	COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
	Marina Landscape	Andy Phom	A, B, C-27	714-939-6600	estimator@marinaco.com
	MERINO Landscape	Chris Merino	C-27	619-778-6145	Chris@merinolandscap.com
	Time				
	ALLIED STORAGE ^{CONTAINERS}	OUVER		615 710-2612	OJARINE@ALLIED 12
	DIG Contractors INC	BRYAN	B	619-456-2982	Bryan.DIGContractors@6mtf.com
	Gem Industrial Inc.	Drew Muehlen	A, C-27	658-486, 1758	Info@GemIndustrialInc.com
	WESTERN P.A. CONSTRUCTORS, INC.	RAY BUDOM	A, B, C-8 C-27	760) 489-4328	RBUDOM@WESTERN.P.A. .NET
	Fordyce Construction, Inc	Brian Fordyce	A+B	619-449-4272	admin@fordyceconstruction.com



WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2449 PLUMBING – BP 03
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

	COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
	JPI Development Group LLC	Jessica Camacho	A, B, C2, C8 C16, C24, C36	951-973-7680	estimating@jpiddevelopment.com
	Interpipe Contracting Inc	Roxie Valentin			info@InterpipeContracting.com
	HPS Mechanical, INC.	Alma Martinez	C36	661-397-2121	Planroom@hpsmechanical.com
	Scott Michael Inc	RobeA Harris	A - C-36	614-339-2920	scottmichaelinc@sbcglobal.net
	Renewage	Anthony Flores	A-B C-10 - C36	424 258 7716	Bidding@renewage.com

WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2450 CONCRETE – BP 04
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
HSCC, Inc.	Trevor Bradbury	A, B, C-8	(978) 518-1975	tbradbury@hscbuilders.com
Team C Construction	Alan Sehlhorst	A, B, C-8	(619) 579-6572 (619) 579-6572	alan@teamcinc.com
Renewage	Anthony Flores	A, B, C10-C36	424-258-7716	Bidding@renewage.com
Gem Industrial Inc	Doug MacLachlan	A, B, C10-C27	858-48671758	Info@GemIndustrialInc.com
Conan Construction	Adrienne Jesse	B, C8	760 707-2520	estimating@conanconstruction.com
Westcoast Rim Constructors	Raj B 400 M	A, B, C-8 C-27	760) 489-4328	R3400M@WESTCOASTRIM.NET
Nexgen Building Group	Josh Kueber	A+B	619-670-4460	estimating@nexgenbuilding.com
Fordyce Construction, Inc	Brian Fordyce	A+B	619 449 4272	bfordyce@Fordyceconstruction.com

WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2451 ROUGH FRAMING – BP 05
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
Conan Construction	Adrienne Jesse	B, C8	760- 107-2520	estimating@ conanconstruction.com
Nexgen Building Group	Josh Kueber	A+B	619-670-4466	estimating@ nexgenbuilding.com
Renewage	Anthony Flores	A-B-C10-C36	424 258 7216	Bidding@renewage.com
Fordyce Construction Inc	Brian Fordyce	A+B	619-449-4272	admin@fordyceconstruction.com

WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2452 FINISH CARPENTRY – BP 06
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

	COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
	Allied Storage Vendor Containers	Larry Speers		619-710-2612	Lspeers@alliedstorage.com
	Renewage	Anthony Flores	A B C 10 e 36	424 258 7716	Bidding@renewage.com
	Fordyce Construction, Inc	Brian Fordyce	A+B	619-449-4272	admin@fordyceconstruction.com
	AS Fistes	Jack Fistes	A F D TC	562-225-9109	CJFistes@gmail.com
	Hollands	Ray Anderson	C10	619 873 6669	ray@hollands cabinets.com



WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2454 FINISHES, CEILINGS, PLASTER, DOORS, FRAMES AND HARDWARE – BP 08
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

	COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
	MILCO	Richard Owens	K	619 248 3361	RBOwen1946@yahoo
	Nexgen Building Group	Josh Kueber	A+B	619-670-4466	estimating@nexgenbuilding.com nexgenbuilding.com
	AJ FISHES	Raymond			
	Fordyce Construction, Inc	Brian Fordyce	A+B	619 449 4272	admin@fordyceconstruction.com
	Conan Construction	Adrienne Jesse	B	760-707-2520	estimating@conanconstruction.com conanconstruction.com
	AZH BUILDERS	KARLA REVOLLAR	AB	619 534 1189	AZH.SD.CONSTRUCTION@GMAIL.COM
	AJ FISHES	Jake Fishes	A+B 0	562-225-563	AJFishes@gmail.com

WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2455 FLOORING – BP 09
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

	COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
	A/S Flooring	STEVE HARMON	C-15 C-54	619 585-8057	STEVE@ASFLOORING.COM
	DFS Flooring	Tom Brown	C-15 C-54	619 522 6717	TomB@DFSFlooring.com
	Pro Specter Contract Flooring	Tom Whittik	C-15 C-54	858 642 7429	tom.whittik@specteracf.com



WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2456 SPECIALTIES – BP 10
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
IBCL	CHRIS BARCELAT		(909) 222-8739	ESTIMATING@IBCLINC.COM
DIG Contractors INC	BRYAN GRANT	A, B	619-456-2982	BRYAN.DIGContractors@gmail.com
Conan Construction	Adrienne Jesse	B	760 707-25320	estimating@ conanconstruction.com
Gem Industrial Inc.	Doug MacLachlan	A, B	658-486-1758	Info@GemIndustrialInc.com.
AZH BUILDERS SD CONSTRUCTION	KARLA REOLLAR	AB	619 534 1189	AKA AZH.SDCONSTRUCTION@AEMAIL.COM
Negen Building Group	Josh Kueber	A+B	619-670-4400	estimating@ negenbuilding.com
Jack AJ Fistes	Jake Fistes	A+B C	562-225-5103	AJ Fistes@gmail.com
Fordyce Construction, Inc	Brian Fordyce	A+B	619-449-4272	admin@fordyce construction.com

WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2457 HVAC & CONTROLS – BP 11
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

	COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
	Renewage	Anthony Flores	A13 C-10 C-36	424 258-7716	Bidding@renewage.com
	R&R Controls Inc.	Rick DesLauriers	C-10	619 516-1880	rick@rrcontrols.com
	Able Heating & Air	Zeba Moreno	C-2D	619.409.9100	zmoreno@ableac.net

WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2458 ELECTRICAL & LOW VOLTAGE – BP 12
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
77 Electrical Services	Paul Gocon		206-599-9146	pgocon@77ElectricalServices.com
77 Elect.	ADAM LEVESQUE		760-872 SAME	SAME
Fuller Electric	Tori Sexton		619-276-5411	estimating@fullerelectric.com
Precision Electric	Susan Legitt		619 966 9671	Estimating@PECSO.com
SATURN Electric, Inc	Bob Dudek	C-10	858-771-4100 cell. 619-987-7910	bob@saturnelectric.com
Time & Alarm	Jacob Vega		951 685 1761 cell - 951 703 5444	jvega@timeandalarm.com
Fordyce Construction, Inc	Brian Fordyce	A+B	619-449-4272	admin@fordyceconstruction.com
Renewage	Anthony Flores	A-B, C10-036	424.258.7716	Bidday@renewage.com

WHHS Science Bld. Modernization Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2459 FIRE SPRINKLERS – BP 13
March 9, 2021, 1:00 pm

PLEASE PRINT LEGIBLY

	COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
	JPI Development Group, Inc	Jessica Camacho	A, B, C, 2, C8, C16, C34, C36	951-973-7680	estimating@jpiddevelopment.com
	Renewage	Anthony Flores	A-B-10-C36	(424) 258 7716	Bidding@renewage.com



Foothills Adult Education Center Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2447 DEMOLITION & ABATEMENT – BP 01
March 9, 2021, 3:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
CONAN Construction	Adrienne Jesse	B,CB	760-707-2520	estimating@conanconstruction.com
Resource Environmental	Chase Tinsley	A,B, C21/C22	(562) 468-7000	Bids@resource-env.com
Integrated Demolition and Remediation Inc	JAY GANDHI	A, B, C1, C22	714.483.1534	JAY@IDRDEMO.COM
RCG	Tam Gutierrez	A, B, C21/C22	562-732-6929	tam@rcgcorp.net
JANUS CORP	JERRY LAMAS	C21/C22 ASB, HAZ	760 598-7374	JERRY@JANUSCORP.COM
Fordyce Construction Inc	Brian Fordyce	A+B	619-449-4272	admin@fordyceconstruction.com
T3 Contractors	Rick Chavez	C21, C22 ASB	957-743-4794	RICK@T3CONTRACTORS.COM
Nexgen Building Group	Josh Kueber	A+B	619-670-4466	estimating@nexgenbuilding.com

	COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
	Gem Industrial Inc.	Doug MacLachlan	A, B	858, 486-1758	Info @ Gem Industrial Inc.com
	Renewage	Anthony Flores	A-B C-10 C36	(424) 258-7716	Bidding @ renewage.com



Foothills Adult Education Center Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2448 LANDSCAPE – BP 02
March 9, 2021, 3:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
Merino Landscape	Chris Merino	79778C C-27	614-778-8145	Chris@merinolandscape.com
Marina Landscape	Andy Pham	C27, A, B	714 939-6600	Estimator@marinaco.com
Renewage	Anthony Flores	A, B, C-10, C36	424 258-2216	Bidding@renewage.com
GEM Industrial Inc	Dovey Muelachlan	A, B, C27	858-486-1758	Info@GemIndustrialInc.com
WESTERN RIM CONSTRUCTORS	Ray Broom	A, B, C-B, C-27	760 489-4328	RBroom@ WESTERNRIM.NET



Foothills Adult Education Center Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2449 PLUMBING – BP 03
March 9, 2021, 3:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
B Contractors	Rich Chavez	C2, 12 <small>ASB</small>	951-743-4771	rich@bcontractors.com
Interpipe Contracting, Inc <small>Plumbing</small>	Rosie Valentine	C34 C36		Info@InterpipeContracting.com
Scott Michael Inc	Robert Harris	A, C-36	619 339 2920	Scottmichael inc @ sbeglobal.net
HPS Mechanical, Inc.	Alma Martinez	C36	661-397-2121 (424)	planroom@hpsmechanical.com
Renewage	Anthony Flores	A-B, C-10, C36	258 7716	Bidding@renewage.com
JPI Development Group, Inc.	Jessica Camacho	A, B, C2, C8 C16, C34	951-973-7680	estimating@jpiddevelopment.com estimating@jpiddevelopment.com



Foothills Adult Education Center Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2450 CONCRETE – BP 04
March 9, 2021, 3:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
Fordyce Construction, LLC	Brian Fordyce	A+B	619-444-4272	admin@fordyceconstruction.com
Conan Construction	Adrienne Jessee	B, C8	619-700 707-2520	estimating@conanconstruction.com
Nexgen Building Group	Josh Kueber	A+B	619-670-4466	estimating@nexgenbuilding.com
HSCC, Inc.	Trevor Bradbury	A, B, C-8	(979) 518-1975	tbradbury@hscbuilders.com
Gem Industrial Inc.	Davey MacLachlan	A, B	858-486-1758	Info@GemIndustrialInc.com
Team C Construction	Alan Sehlhorst	A, B, C-P	(619) 577-6572	Alan@teamcin.com
Renewage	Anthony Flores	A B c-10 c-26	424 258 7716	Bidding@renewage.com
Weston Builders, Inc.	Roy Byrom	A, B, C-8, C-27	760 489-4728	RBYROM@WESTONB.COM.NET



Foothills Adult Education Center Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2451 ROUGH FRAMING – BP 05
March 9, 2021, 3:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
Conan Construction	Adrienne Jessee	B,CB	760 707-2520	estimating@ conanconstruction.com
Fordyce Construction, Inc	Brian Fordyce	A+B	619-449-4272	admin@fordyce construction.com
Nexgen Building Group	Josh Kueber	A+B	619-670-4466	estimating@nexgenbuilding.com
Renewage	Anthony Flores	A-B C-10 C-36	424 258 7216	Bidding@renewage.com
AZH BUILDING + SD CONSTRUCTION	KARLA REVOLLO	A	619-534-1189	AZH, SD CONSTRUCTION @ GMAIL .COM



Foothills Adult Education Center Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2452 FINISH CARPENTRY – BP 06
March 9, 2021, 3:00 pm

Casework

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
AS FISTES	Jake Fistes	AB TC	562-225-5123	AsFistes@gmail.com
Renewage	Anthony Flores	A-B C10 C36	(424) 258 7716	Bidding@renewage.com
Hollands Cabinets	Ray Anderson	CU	873 6209 873 6209	Ray@HollandsCabinets.com



Foothills Adult Education Center Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2454 FINISHES, CEILINGS, PLASTER, DOORS, FRAMES AND HARDWARE – BP 08
March 9, 2021, 3:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
Fordyce Construction, Inc	Brian Fordyce	ATB	619-449-4272	admin@fordyceconstruction.com
Nexgen Building Group	Josh Kueber	A+B	619 670 4466	estimating@nexgenbuilding.com
AZH BUILDING * SD CONSTRUCTION	KARLA REVOLLA	AS	619 534 1189	AZH.SD CONSTRUCTION@gmail.com
AS FISTES	Jake Fistes	A,B,C	562-225-5103	AS Fistes@gmail.com
Conan Construction	Adrienne Jesse	B,C8	760-707 2520	estimating@conanconstruction.com
Renewage	Anthony Flores	A,B,C-10,C36	(424) 258 7718	Bidding@renewage.com
AZH BUILDERS	KARLA REVOLLA			



Foothills Adult Education Center Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2455 FLOORING – BP 09
March 9, 2021, 3:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
AFS FLOORING	STEVE HARMON	C-15 C-54	419 585-8057	Steve@AsFlooring.com
ProSpecter Contract Flooring	Tom Wirth	C-15 C-54	857 642 7429	tom.wirth@SpecterCF.com
CONAN construction	Adrienne Jesse	B/C 8	7100 707-2520	estimating@ conanconstruction.com
Renewage	Anthony Flores	A B C-10 C-36	424 258 7716	Bidding@renewage.com



Foothills Adult Education Center Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2456 SPECIALTIES – BP 10
March 9, 2021, 3:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
FBCC INLAND BUILDING	CHRIS BARKER		(909) 222-8739	ESTIMATING @ FBCC INC. FBCCINC.COM
DIG Contractors INC	BRYAN Grant	A, D	619-456-2992	BRYAN.DIGContractors@gmail.com
AS FISTES	Jake FISTES	A, B, C	562-225-5103	ASFISTES@gmail.com
Nexgen Building Group	Josh Kueber	A+B	619 670 4466	estimating@ nexgenbuilding.com
Fordyce Construction, Inc	Bryan Fordyce	A+B	619-449-4272	admin@Fordyce construction.com
AZH BUILDING & SD CONSTRUCTION	KARLA REVOLLAR	A+B	619 534 1189	AZH SD CONSTRUCTION @ gmail.com
Conan Construction	Adrienne JESSEE	B, C, S	760- 707-2520	estimating@ Conan construction.com
Gem Industrial Inc.	Doug MacLachlan	A, B	858-486-1758	Info @ Gem Industrial, Inc.com



Foothills Adult Education Center Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2457 HVAC & CONTROLS – BP 11
March 9, 2021, 3:00 pm

PLEASE PRINT LEGIBLY

	COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
	R&R Controls Inc.	Rick DesLauriers	C-10	619 516-1880	rick@rrcontrols.com
	Renewage	Anthony Flores	A13 C-10 C36	424 258-7716	Bidding@renewage.com
	Able Heating & Air	Zeke Moreno	C-2D	619.409.9100	zmoreno@ableac.net



Foothills Adult Education Center Jobwalk Sign-In Sheet



PROJECT NUMBER
CN-2458 ELECTRICAL & LOW VOLTAGE – BP 12
March 9, 2021, 3:00 pm

PLEASE PRINT LEGIBLY

COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
Fuller Electric	Tori	C10	619 276-5411	estimating@fullerelectric.com
SATURN Electric, Inc	Bob Dued	C10	858-371-4100	bob@saturnelectric.com
77 Electrical Services	Paul G.	C-10	206-599-9146	pg@77ElectricalServices.com
precision Electric	Susan Legit	C-10	619 966 9671	Estimating@PECS D.com
Renewage	Anthony Flores	A13 C10 C36	424 258 7716	Bidding@renewage.com
77777 Gem Industrial Inc	Dug MacLachlan	C-10	6586-4585-1758	Info@gemIndustrialInc.com



Foothills Adult Education Center

Jobwalk Sign-In Sheet



PROJECT NUMBER
 CN-2459 FIRE SPRINKLERS – BP 13
 March 9, 2021, 3:00 pm

PLEASE PRINT LEGIBLY

	COMPANY	CONTACT	LICENSE CLASS	PHONE	EMAIL
	JPI Development Group, Inc.	Jessica Camacho	A/C, C1C8 C16 C24 C36	951-973-7680	estimating@jpiddevelopment.com
	Renewage	Anthony Flores	A B C-10 C-3	424 258 7716	Bidding@renewage.com

Attn: This first page is an **invoice**. Please forward it to your accounting department. The rest of the document is your Good Faith Effort Documentation.

From: Compliance News Publishing Company

<http://www.compliancenes.com>

info@compliancenes.com

Tel: 562-439-2788 Fax: 562-439-1398

216 The Promenade N. Ste. 304 Long Beach, CA 90802

TO: Balfour Beatty Construction

10620 Treena Street

San Diego, CA, 92131

Phone: (858) 635-7442

Fax: (000) 000-0000

INVOICE for Ad: 70035

Published on 03/01/2021

For Project:

Grossmont Union High School District - FOOTHILLS ADULT
REMODEL AND WEST HILLS SCIENCE RENOVATION MULTI
PRIME

Total Amount DUE: \$35.00

Please forward to your Accounting Department. We do not mail invoices.

Compliance News Monthly Trade Journal
Publication Affidavit-Declaration of Publication -- State of California

Balfour Beatty Construction is seeking certified and qualified DVBE,SDVOB subs and/or suppliers to provide
CN-2447 Demolition & Abatement A or B or C21
CN-2448 Landscape A or C27
CN-2449 Plumbing C34 & C36 or C36 & C42 or A & C36
CN-2450 Concrete A or B or C8
CN-2451 Rough Framing B
CN-2452 Finish Carpentry C6
CN-2453 Glazing C17
CN-2454 Finishes, Ceilings Plaster, Doors, Frames And Hardware B or C2 & C9 & C28 & C35
CN-2455 Flooring C15 & C54
CN-2456 Specialties B
CN-2457 HVAC & Controls C20
CN-2458 Electrical & Low Voltage C10
CN-2459 Fire Sprinklers C16
for Grossmont Union High School District -
FOOTHILLS ADULT REMODEL AND WEST HILLS SCIENCE RENOVATION MULTI PRIME in Santee,CA

NOTICE IS HEREBY GIVEN that the Governing Board of the Grossmont Union High School District ("District") is inviting prequalified contractors with prequalified subcontractors to submit sealed bids for the construction project described below ("Project").

FOOTHILLS ADULT REMODEL AND WEST HILLS SCIENCE RENOVATION MULTI PRIME

PLACE FOR SUBMITTING BIDS: Bids must be delivered to the District at the following location: Grossmont Union High School District Bond Trailer, 9600 ? Milden Street, La Mesa, CA, 91942

BID DEADLINE: Bids must be delivered to and received by the District at the location specified above as the place for submitting bids not later than the date and time specified below, at which time the District will publicly open and read all bids. Any bid received by the District after the Bid Deadline shall be returned to the bidder unopened. Bids must be received by the District no later than the following Bid Deadline: March 24, 2021 at 2:00 pm

OBTAINING OFFICIAL BID DOCUMENTS: Prospective bidders may secure a set of bid documents as of March 1, 2021, for the Project at Mayer Reprographics, 1065 University Avenue, San Diego, CA 92103, (619) 295-4112. Information is available at Mayer.com; click on Projects Bidding. Plans and specifications will be available in electronic format at the Contractor's cost. GUHSD is not responsible for the completeness of plans and specifications from any other source. Notification of addendums will only be made to contractors that have registered with Mayer Reprographics.

Contact: Rian Pinson
10620 Treena Street
San Diego,CA,92131
Phone:(858) 635-7442
Fax:(000) 000-0000
Email:rpinson@guhdsd.net

Bid Due on:03/24/2021 at 02:00 PM
Solicitation Number: rpinson@guhdsd.net

SCOPE: Remodel of 32,806 Sq. Ft. of interior space at Foothills campus, including offices, classrooms, and restrooms. Also including site landscape improvements. Interior renovation of ten science classrooms and lecture classroom at West Hills, including some sitework and demolition. Both campuses include accessibility upgrades and finishes.

REQUIREMENTS FOR BID: Bids must be submitted on the Bid Form provided by the District and included in the bid documents. Each bid must strictly conform with and be responsive to this Notice Inviting Bids, the Instructions for Bidders, and other Contract Documents. The District reserves the right to reject any or all bids or to waive any irregularities or informalities in any bids or in the bidding. Except as provided in Public Contract Code Section 5100 et seq., no bidder may withdraw a bid for a period of ninety (90) calendar days after the opening of the bids.

PREQUALIFICATION: This Project expenditure is valued at \$1 million or more, therefore all Prime Contractors and Subcontractors identified in Public Contract Code (PCC) section 20111.6 must be prequalified. Contractors/Subcontractors must submit a prequalification application online at QualityBidders.com per the schedule, this includes renewals. For details on prequalification procedures for Prime and Subcontractors please see the District website

<http://www.guhsd.net/Departments/Business-Services/Purchasing/Prequalification/index.html>. Bidders are advised that all First tiered subcontractors, even those under ? of 1% and that are Mechanical, Electrical or Plumbing ("MEP") must be listed in your bid package regardless of the percentage of work. All General (Prime) Contractors and All MEP first tier subcontractors that HOLD the stated licenses in PCC 20111.6 must be prequalified to work on this Project in accordance with the time requirements set forth above.

DVBE: This bid is subject to Disabled Veteran Business Enterprise requirements. Minority, women, and disabled veteran contractors are encouraged to submit bids. District is required to have 3% percentage each year. Bidder must provide a DVBE prime or subcontractor at 3% or complete the Good Faith Efforts package. Construction Manager will place a DVBE ad. All paperwork is due at time of bid.

DIR REGISTRATION AND LABOR COMPLIANCE MONITORING: Except as provided in Labor Code Section 1771.1(a), no Contractor or Subcontractor may be listed on a bid proposal for a public works project submitted on or after March 1, 2015, or perform work on a public works

contract awarded on or after April 1, 2015, unless registered with the Department of Industrial Relations pursuant to California Labor Code Section 1725.5. This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Contractor and any Subcontractors engaging in work on the Project are required to review and comply with the provisions of the California Labor Code, Division 2, Part 7, Chapter 1, beginning with Section 1720, and the regulations of the Department of Industrial Relations implementing those provisions. These statutory and regulatory provisions contain specific requirements concerning, for example, the determination and payment of prevailing wages, retention, inspection and auditing of payroll records, use of apprentices, payment of overtime compensation, and various penalties or fines which may be imposed for violations of the requirements of the chapter. Submission of a bid proposal constitutes the bidder's representation that it has thoroughly reviewed these statutory and regulatory requirements and agrees to bind every Subcontractor performing work on the Project to these requirements to the extent such requirements are applicable to the Subcontractor's work.

REQUIRED BID SECURITY: Each bid must be submitted with security in an amount not less than ten percent (10%) of the maximum bid amount as a guarantee that the bidder will enter into the proposed contract, if awarded to the bidder, and will provide the performance and payment bonds, insurance certificates and other documents described in the Contract Documents. Such security must be in one of the following forms: (1) a cashier's check made payable to the District; (2) a certified check made payable to the District; or (3) a bond made payable to the District in the form set forth in the Contract Documents. Any bond must have been issued by a California admitted surety as defined in Code of Civil Procedure Section 995.120

REQUIRED CONTRACTOR LICENSE: The class(es) of California contractor's license(s) required in order to bid on and perform the contract for this Project is:

CN-2447 Demolition & Abatement A or B or C21
CN-2448 Landscape A or C27
CN-2449 Plumbing C34 & C36 or C36 & C42 or A & C36
CN-2450 Concrete A or B or C8
CN-2451 Rough Framing B
CN-2452 Finish Carpentry C6
CN-2453 Glazing C17
CN-2454 Finishes, Ceilings
Plaster, Doors, Frames
And Hardware B or C2 & C9 & C28 & C35
CN-2455 Flooring C15 & C54
CN-2456 Specialties B
CN-2457 HVAC & Controls C20
CN-2458 Electrical & Low Voltage C10
CN-2459 Fire Sprinklers C16

MANDATORY PRE-BID CONFERENCE AND SITE VISIT: The District will conduct a pre-bid conference and site visit on March 9, 2021 for the purpose of acquainting all prospective bidders with the bid documents and the work site. Attendance is mandatory at BOTH sites, and any bidder that does not attend may be disqualified from work on the Project. The pre-bid conference(s) will begin at the West Hills campus at 1:00 pm, 8756 Mast Blvd, 92071. Then reconvene at the Foothills campus at 3:00 pm, 1550 Melody Lane, 92019.

DISTRICT STANDARDS: The District has made a finding that certain brand or trade names are necessary in order to maintain conformity among its campuses, to maintain compatibility with existing systems, and to streamline maintenance and parts storage. A copy of the resolution is incorporated in the bid documents under Specifications.

PERFORMANCE AND PAYMENT BONDS: The successful bidder will be required to provide both a performance bond and a separate payment bond, each in an amount equal to 100% of the total contract amount. The forms of the bonds are set forth in the Contract Documents and all bonds must be issued by a California-admitted surety as defined in California Code of Civil Procedure Section 995.120.

PREVAILING WAGES: The Project is a public work and the successful bidder and each of its subcontractors of any tier will be required to pay not less than the general prevailing rates of per diem wages in the locality in which the work is to be performed for each craft or type of worker needed to execute the contract ("Prevailing Wages"). A copy of the per-diem rates of Prevailing Wages applicable to the Project is on file and available for review at the location specified above as the place for submitting bids, and a copy will be posted at the site of the Project. Wages can be found at <http://www.dir.ca.gov/OPRL/PWD/Index.htm>.

SUBCONTRACTORS: Bidder shall include the name, location of the place of business, and the California contractor license number of each subcontractor who will perform work or assist the bidder in completing the Project, pursuant to the Subletting and Subcontracting Fair Practices Act. An inadvertent error in listing the contractor license number shall not be grounds for filing a bid protest or grounds for considering a bid nonresponsive, assuming the corrected contractor's license number is submitted by the bidder within twenty-four (24) hours after the bid opening and the corrected contractor's license number corresponds to the submitted name and location for that subcontractor.

District Contact: Rian Pinson, Director of Purchasing, rpinson@guhsd.net

Construction Estimate: \$6,500,000

Dated this 1 day of March, 2021 Clerk of the Governing Board Grossmont Union High School District San Diego County, California	
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The Balfour Beatty Construction Good Faith Effort ad has been published in both the Compliance News Internet and Hard-Copy publications.

Located Online at: http://www.compliancencenews.com/classified_monthly

The undersigned declares:

I am over the age of 18 years and a citizen of the United States. I am the principal publisher of the Compliance News Monthly Trade Journal in the City of Long Beach, County of Los Angeles, and the State of California. The notice, a true copy of which is attached was published on Mon Mar 01 17:36:34 +0000 2021

I declare under penalty of perjury that the foregoing is true and correct. Executed at Long Beach, California

Henry Sprague III

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Compliance News Daily Focus Journal

Publication Affidavit-Declaration of Publication -- State of California

Balfour Beatty Construction is seeking certified and qualified DVBE,SDVOB subs and/or suppliers to provide
CN-2447 Demolition & Abatement A or B or C21
CN-2448 Landscape A or C27
CN-2449 Plumbing C34 & C36 or C36 & C42 or A & C36
CN-2450 Concrete A or B or C8
CN-2451 Rough Framing B
CN-2452 Finish Carpentry C6
CN-2453 Glazing C17
CN-2454 Finishes, Ceilings Plaster, Doors, Frames And Hardware B or C2 & C9 & C28 & C35
CN-2455 Flooring C15 & C54
CN-2456 Specialties B
CN-2457 HVAC & Controls C20
CN-2458 Electrical & Low Voltage C10
CN-2459 Fire Sprinklers C16
for Grossmont Union High School District -
FOOTHILLS ADULT REMODEL AND WEST HILLS SCIENCE RENOVATION MULTI PRIME in Santee,CA

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Contact: Rian Pinson
10620 Treena Street
San Diego,CA,92131
Phone:(858) 635-7442
Fax:(000) 000-0000
Email:rpinson@guhdsd.net

Bid Due on:03/24/2021 at 02:00 PM
Solicitation Number: rpinson@guhdsd.net

SCOPE: Remodel of 32,806 Sq. Ft. of interior space at Foothills campus, including offices, classrooms, and restrooms. Also including site landscape improvements. Interior renovation of ten science classrooms and lecture classroom at West Hills, including some sitework and demolition. Both campuses include accessibility upgrades and finishes.

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PREQUALIFICATION: This Project expenditure is valued at \$1 million or more, therefore all Prime Contractors and Subcontractors identified in Public Contract Code (PCC) section 20111.6 must be prequalified. Contractors/Subcontractors must submit a prequalification application online at QualityBidders.com per the schedule, this includes renewals. For details on prequalification procedures for Prime and Subcontractors please see the District website

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REQUIRED BID SECURITY: Each bid must be submitted with security in an amount not less than ten percent (10%) of the maximum bid amount as a guarantee that the bidder will enter into the proposed contract, if awarded to the bidder, and will provide the performance and payment bonds, insurance certificates and other documents described in the Contract Documents. Such security must be in one of the following forms: (1) a cashier's check made payable to the District; (2) a certified check made payable to the District; or (3) a bond made payable to the District in the form set forth in the Contract Documents. Any bond must have been issued by a California admitted surety as defined in Code of Civil Procedure Section 995.120

REQUIRED CONTRACTOR LICENSE: The class(es) of California contractor's license(s) required in order to bid on and perform the contract for this Project is:

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CN-2448 Landscape A or C27
CN-2449 Plumbing C34 & C36 or C36 & C42 or A & C36
CN-2450 Concrete A or B or C8
CN-2451 Rough Framing B
CN-2452 Finish Carpentry C6
CN-2453 Glazing C17
CN-2454 Finishes, Ceilings
Plaster, Doors, Frames
And Hardware B or C2 & C9 & C28 & C35
CN-2455 Flooring C15 & C54
CN-2456 Specialties B
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DISTRICT STANDARDS: The District has made a finding that certain brand or trade names are necessary in order to maintain conformity among its campuses, to maintain compatibility with existing systems, and to streamline maintenance and parts storage. A copy of the resolution is incorporated in the bid documents under Specifications.

PERFORMANCE AND PAYMENT BONDS: The successful bidder will be required to provide both a performance bond and a separate payment bond, each in an amount equal to 100% of the total contract amount. The forms of the bonds are set forth in the Contract Documents and all bonds must be issued by a California-admitted surety as defined in California Code of Civil Procedure Section 995.120.

PREVAILING WAGES: The Project is a public work and the successful bidder and each of its subcontractors of any tier will be required to pay not less than the general prevailing rates of per diem wages in the locality in which the work is to be performed for each craft or type of worker needed to execute the contract ("Prevailing Wages"). A copy of the per-diem rates of Prevailing Wages applicable to the Project is on file and available for review at the location specified above as the place for submitting bids, and a copy will be posted at the site of the Project. Wages can be found at <http://www.dir.ca.gov/OPRL/PWD/Index.htm>.

SUBCONTRACTORS: Bidder shall include the name, location of the place of business, and the California contractor license number of each subcontractor who will perform work or assist the bidder in completing the Project, pursuant to the Subletting and Subcontracting Fair Practices Act. An inadvertent error in listing the contractor license number shall not be grounds for filing a bid protest or grounds for considering a bid nonresponsive, assuming the corrected contractor's license number is submitted by the bidder within twenty-four (24) hours after the bid opening and the corrected contractor's license number corresponds to the submitted name and location for that subcontractor.

District Contact: Rian Pinson, Director of Purchasing, rpinson@guhsd.net

Construction Estimate: \$6,500,000

Dated this 1 day of March, 2021 Clerk of the Governing Board Grossmont Union High School District San Diego County, California	
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The Balfour Beatty Construction Good Faith Effort ad has been published in both the Compliance News Internet and Hard-Copy publications.

Located Online at: http://www.compliancencenews.com/classified_daily

The undersigned declares:

I am over the age of 18 years and a citizen of the United States. I am the principal publisher of the Compliance News Monthly Trade Journal in the City of Long Beach, County of Los Angeles, and the State of California. The notice, a true copy of which is attached was published on Mon Mar 01 17:36:34 +0000 2021

I declare under penalty of perjury that the foregoing is true and correct. Executed at Long Beach, California

Henry Sprague III

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Attn: This first page is an **invoice**. Please forward it to your accounting department. The rest of the document is your Good Faith Effort Documentation.

From: Compliance News Publishing Company

<http://www.compliancenes.com>

info@compliancenes.com

Tel: 562-439-2788 Fax: 562-439-1398

11 S. Termino, Suite 214, Long Beach, CA 90803

TO: Balfour Beatty Construction

10620 Treena Street

San Diego, CA, 92131

Phone: (858) 635-7442

Fax: (000) 000-0000

INVOICE for Ad: 70103

Published on 03/08/2021

For Project:

Grossmont Union High School District - FOOTHILLS ADULT
REMODEL AND WEST HILLS SCIENCE RENOVATION MULTI
PRIME

Total Amount DUE: \$35.00

Please forward to your Accounting Department. We do not mail invoices.

Compliance News Monthly Trade Journal
Publication Affidavit-Declaration of Publication -- State of California

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NTB - 2

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Compliance News Daily Focus Journal

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NTB - 2

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- CN-2459 Fire Sprinklers C16

MANDATORY PRE-BID CONFERENCE AND SITE VISIT: The District will conduct a pre-bid conference and site visit on March 9, 2021 for the purpose of acquainting all prospective bidders with the bid documents and the work site.

<p>Attendance is mandatory at BOTH sites, and any bidder that does not attend may be disqualified from work on the Project. The pre-bid conference(s) will begin at the West Hills campus at 1:00 pm, 8756 Mast Blvd, 92071. Then reconvene at the Foothills campus at 3:00 pm, 1550 Melody Lane, 92019.</p> <p>DISTRICT STANDARDS: The District has made a finding that certain brand or trade names are necessary in order to maintain conformity among its campuses, to maintain compatibility with existing systems, and to streamline maintenance and parts storage. A copy of the resolution is incorporated in the bid documents under Specifications.</p> <p>PERFORMANCE AND PAYMENT BONDS: The successful bidder will be required to provide both a performance bond and a separate payment bond, each in an amount equal to 100% of the total contract amount. The forms of the bonds are set forth in the Contract Documents and all bonds must be issued by a California-admitted surety as defined in California Code of Civil Procedure Section 995.120.</p> <p>PREVAILING WAGES: The Project is a public work and the successful bidder and each of its subcontractors of any tier will be required to pay not less than the general prevailing rates of per diem wages in the locality in which the work is to be performed for each craft or type of worker needed to execute the contract ("Prevailing Wages"). A copy of the per-diem rates of Prevailing Wages applicable to the Project is on file and available for review at the location specified above as the place for submitting bids, and a copy will be posted at the site of the Project. Wages can be found at http://www.dir.ca.gov/OPRL/PWD/Index.htm.</p> <p>SUBCONTRACTORS: Bidder shall include the name, location of the place of business, and the California contractor license number of each subcontractor who will perform work or assist the bidder in completing the Project, pursuant to the Subletting and Subcontracting Fair Practices Act. An inadvertent error in listing the contractor license number shall not be grounds for filing a bid protest or grounds for considering a bid nonresponsive, assuming the corrected contractor's license number is submitted by the bidder within twenty-four (24) hours after the bid opening and the corrected contractor's license number corresponds to the submitted name and location for that subcontractor.</p> <p>District Contact: Rian Pinson, Director of Purchasing, rpinson@guhsd.net Construction Estimate: \$6,500,000 Dated this 1 day of March, 2021 Clerk of the Governing Board Grossmont Union High School District San Diego County, California</p>	
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The Balfour Beatty Construction Good Faith Effort ad has been published in both the Compliance News Internet and Hard-Copy publications.
Located Online at: http://www.compliancencenews.com/classified_daily

The undersigned declares:

I am over the age of 18 years and a citizen of the United States. I am the principal publisher of the Compliance News Monthly Trade Journal in the City of Long Beach, County of Los Angeles, and the State of California. The notice, a true copy of which is attached was published on Mon Mar 08 23:09:46 +0000 2021

I declare under penalty of perjury that the foregoing is true and correct. Executed at Long Beach, California

Henry Sprague III

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Pre-Bid RFI Answer Log

Bid RFI #	Date Received	Sheet/Spec	Issue/Question	Answer	Add. Addressed																																																								
1	3/3/2021	N/A	Hamel is interested in bidding the mentioned project. Is there an engineer's estimate for bid packages CN2450 Concrete, CN2454 Finishes & CN2456 Specialties? If so, can you please provide them to me	<p>Estimates for all packages are provided as a separate attachment "WHHS FAEC Bid Package Estimates" issued with this Addendum.</p> <table border="1"> <thead> <tr> <th>Bid Pkg No.</th> <th>Bid Package Title</th> <th>Description</th> <th>Budget</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>DEMOLITION</td> <td>Demolition & Hazardous Abatement</td> <td>\$ 529,500.00</td> </tr> <tr> <td>02</td> <td>LANDSCAPE</td> <td>Landscape & Irrigation</td> <td>\$ 116,000.00</td> </tr> <tr> <td>03</td> <td>PLUMBING</td> <td>Plumbing & Utilities</td> <td>\$ 534,500.00</td> </tr> <tr> <td>04</td> <td>CONCRETE</td> <td>Concrete, Earthwork, Site Furnishings, Site Work, Striping, Shade Structure</td> <td>\$ 385,000.00</td> </tr> <tr> <td>05</td> <td>ROUGH CARPENTRY</td> <td>Rough Carpentry</td> <td>\$ 211,000.00</td> </tr> <tr> <td>06</td> <td>FINISH CARPENTRY</td> <td>Countertops, Casework & Finish Carpentry</td> <td>\$ 702,000.00</td> </tr> <tr> <td>07</td> <td>GLAZING</td> <td>Storefront, Glass and Glazing</td> <td>\$ 34,000.00</td> </tr> <tr> <td>08</td> <td>FINISHES</td> <td>Lath & Plaster, Metal Stud Framing, Misc. Metals & Rail, Drywall, Insulation, Doors/Frames/Hardware, Acoustical Tile & Paint</td> <td>\$ 1,652,000.00</td> </tr> <tr> <td>09</td> <td>FLOORING</td> <td>Resilient Flooring, Carpet, Ceramic Tile, Base</td> <td>\$ 545,000.00</td> </tr> <tr> <td>10</td> <td>SPECIALTIES</td> <td>Specialties, Signage, Lockers, Auditorium Seating, Folding Panel Partition, Toilet Partitions & Accessories</td> <td>\$ 231,000.00</td> </tr> <tr> <td>11</td> <td>HVAC & CONTROLS</td> <td>Mechanical HVAC & HVAC Controls, Duct Cleaning</td> <td>\$ 335,000.00</td> </tr> <tr> <td>12</td> <td>ELECTRICAL & LOW VOLTAGE</td> <td>Electrical, Low Voltage, A/V, Security</td> <td>\$ 1,160,000.00</td> </tr> <tr> <td>13</td> <td>FIRE SPRINKLERS</td> <td>Fire Sprinklers</td> <td>\$ 65,000.00</td> </tr> </tbody> </table>	Bid Pkg No.	Bid Package Title	Description	Budget	01	DEMOLITION	Demolition & Hazardous Abatement	\$ 529,500.00	02	LANDSCAPE	Landscape & Irrigation	\$ 116,000.00	03	PLUMBING	Plumbing & Utilities	\$ 534,500.00	04	CONCRETE	Concrete, Earthwork, Site Furnishings, Site Work, Striping, Shade Structure	\$ 385,000.00	05	ROUGH CARPENTRY	Rough Carpentry	\$ 211,000.00	06	FINISH CARPENTRY	Countertops, Casework & Finish Carpentry	\$ 702,000.00	07	GLAZING	Storefront, Glass and Glazing	\$ 34,000.00	08	FINISHES	Lath & Plaster, Metal Stud Framing, Misc. Metals & Rail, Drywall, Insulation, Doors/Frames/Hardware, Acoustical Tile & Paint	\$ 1,652,000.00	09	FLOORING	Resilient Flooring, Carpet, Ceramic Tile, Base	\$ 545,000.00	10	SPECIALTIES	Specialties, Signage, Lockers, Auditorium Seating, Folding Panel Partition, Toilet Partitions & Accessories	\$ 231,000.00	11	HVAC & CONTROLS	Mechanical HVAC & HVAC Controls, Duct Cleaning	\$ 335,000.00	12	ELECTRICAL & LOW VOLTAGE	Electrical, Low Voltage, A/V, Security	\$ 1,160,000.00	13	FIRE SPRINKLERS	Fire Sprinklers	\$ 65,000.00	1
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2	3/5/2021	N/A	<p>For the project referenced above which is a multi prime, I noticed there wasn't a section for painting and usually it'll be under finishes which is a C33 license. See attached and please confirm if there is supposed to be a painting section or not, thank you.</p> <p>REQUIRED CONTRACTOR LICENSE: The class(es) of California contractor's license(s) required in order to bid on and perform the contract for this Project is:</p> <p>CN-2447 Demolition & Abatement A or B or C21 CN-2448 Landscape A or C27 CN-2449 Plumbing C34 & C36 or C36 & C42 or A & C36 CN-2450 Concrete A or B or C8 CN-2451 Rough Framing B CN-2452 Finish Carpentry C6 CN-2453 Glazing C17 CN-2454 Finishes, Ceilings, Plaster, Doors, Frames And Hardware B or C2 & C9 & C28 & C35 CN-2455 Flooring C15 & C54 CN-2456 Specialties B CN-2457 HVAC & Controls C20 CN-2458 Electrical & Low Voltage C10</p>	<p>Painting is confirmed to be included under the CN-2454, BP 08 FINISHES scope of work. Please see DOW included as part of Attachment C_Supplementary Special Conditions, as well as the Dot Matrix also included in Attachment C. The appropriate contractor's license is required for this work.</p>	1																																																								
3	3/8/2021	N/A	<p>Where or who do I contact about DBVE (directions asy to contact the awarding body) . There is no location or link on the District page, just a PDF of the directions about how to do the DVBE good faith.</p> <p>Also, will the Cm be doing the DBVE Bid advertisement for the project? or do we need to do that?</p>	<p>Requirement is to follow the directions for the Good Faith Effort.</p> <p>Copy of DVBE ads are included in this Addendum.</p>	1																																																								

4	3/11/2021	N/A	<p>Good morning to you, I hope all is well. We are the manufacturer listed in the plans for the service pass thru windows. We would like to provide pricing for your project on these units or will you be running this through the GC or glazier?</p> <p>Are there updated specifications and plans at this time to ensure quote and product accuracy?</p>	<p>All Glazing, Window, Storefront and Glass scope is assigned to Bid Package 08 FINISHES. See jobwalk sign in sheets for firms to contact.</p> <p>WHHS Plans and specifications are included in this addendum.</p>	1
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WHHS FAEC Bid Package Estimates



**WHHS & FAEC Renovations
FINAL - BID PACKAGE BUDGETS**

Bid Pkg No.	Bid Package Title	Description	Budget
01	DEMOLITION	Demolition & Hazardous Abatement	\$ 529,500.00
02	LANDSCAPE	Landscape & Irrigation	\$ 116,000.00
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WHHS List of Structural Tests & Special Inspections 2019

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2019 CBC

Application Number: 04-119771	School Name: West Hills High School	School District: Grossmont Union High School District
DSA File Number: 37-H4	Increment Number:	Date Created: 2020-12-18 10:31:05

2019 CBC

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2019 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

Application Number: 04-119771	School Name: West Hills High School	School District: Grossmont Union High School District
DSA File Number: 37-H4	Increment Number:	Date Created: 2020-12-18 10:31:05

7. CAST-IN-PLACE CONCRETE				
Test or Special Inspection		Type	Performed By	Code References and Notes
Material Verification and Testing:				
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Periodic	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-14 Section 26.6.1.2; DSA IR 17-10. (See Appendix for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-14 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f'c).	Test	LOR	1905A.1.15; ACI 318-14 Section 26.12.
Inspection:				
<input checked="" type="checkbox"/>	e. Batch plant inspection: Periodic	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or eliminated per 1705A.3.3.2. (See Appendix for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category 19.1(d) & (e) and/or 19.2(g) & (h) below.		

8. PRESTRESSED / POST-TENSIONED CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):
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DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

Application Number: 04-119771	School Name: West Hills High School	School District: Grossmont Union High School District
DSA File Number: 37-H4	Increment Number:	Date Created: 2020-12-18 10:31:05

	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 11. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-14 Section 26.13

9. PRECAST CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-14 Section 26.13.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.

10. SHOTCRETE (in addition to Cast-in-Place Concrete tests and inspections):				
	Test or Special Inspection	Type	Performed By	Code References and Notes

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

Application Number: 04-119771	School Name: West Hills High School	School District: Grossmont Union High School District
DSA File Number: 37-H4	Increment Number:	Date Created: 2020-12-18 10:31:05

<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.19, Table 1705A.3 Item 7, 1908A.6, 1908A.7, 1908A.8, 1908A.9, 1908A.11, 1908A.12. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.5, 1908A.10.

11. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix for exemptions). ACI 318-14 Sections 17.8 & 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input checked="" type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix for exemptions.)

12. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 04-119771	School Name: West Hills High School	School District: Grossmont Union High School District
DSA File Number: 37-H4	Increment Number:	Date Created: 2020-12-18 10:31:05

Exempt items given in DSA IR A-22 or the 2019 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

SOILS:	
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing designed based on minimum allowable pressures per CBC Table 1806A.2 and having no geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill.

CONCRETE/MASONRY:	
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding") given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding."
<input type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number: 04-119771	School Name: West Hills High School	School District: Grossmont Union High School District
DSA File Number: 37-H4	Increment Number:	Date Created: 2020-12-18 10:31:05

<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1.16. Refer to construction documents for specific exemptions accordingly for each applicable wall condition.
<input type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	Welding:
<input type="checkbox"/>	1. Solid-clad and open-mesh gates with maximum leaf span or rolling section for rolling gates of 10' and apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections 19, 19.1 and/or 19.2 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections 19, 19.1 and/or 19.2 of listing above).

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number:
04-119771
DSA File Number:
37-H4

School Name:
West Hills High School
Increment Number:

School District:
Grossmont Union High School District
Date Created:
2020-12-18 10:31:05

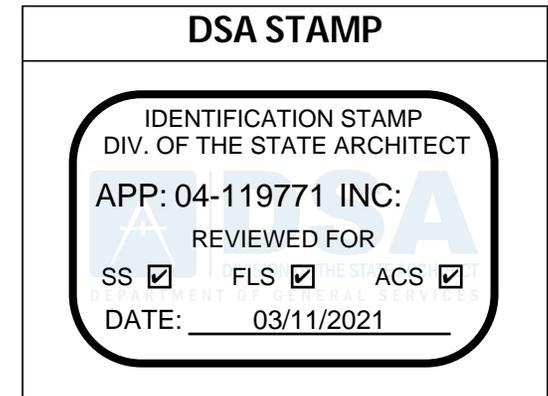
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for section 19, 19.1 and/or 19.2 located in the Steel/Aluminum category).
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) $\leq 4'$ above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2019 CBC

Application Number: 04-119771	School Name: West Hills High School	School District: Grossmont Union High School District
DSA File Number: 37-H4	Increment Number:	Date Created: 2020-12-18 10:31:05

Name of Architect or Engineer in general responsible charge: David Ruhnau (Ruhnau Clarke Architects) C-20662	
Name of Structural Engineer (When structural design has been delegated): Larry R. Kaprielian (KNA Structural Engineers) S-2795	
Signature of Architect or Structural Engineer: 	Date: 12/18/2020

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.



DSA 103-19: LIST OF REQUIRED VERIFIED REPORTS, CBC 2019

Application Number:
04-119771
DSA File Number:
37-H4

School Name:
West Hills High School
Increment Number:

School District:
Grossmont Union High School District
Date Created:
2020-12-18 10:31:05

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

2. Concrete Batch Plant Inspection: Laboratory Verified Report Form DSA 291

3. Post-installed Anchors: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292
