

PROJECT MANUAL

MAGNOLIA ELEMENTARY SCHOOL - RELOCATABLES

CAJON VALLEY UNION SCHOOL DISTRICT

EL CAJON, CA

CONSTRUCTION DOCUMENTS

VOLUME 1 OF 1 Divisions 00 - 33

DSA Application #04 - 122209 File #37- 9

1.16.02

March 2023

**SECTION 00 01 01
PROJECT TITLE PAGE**

FOR

RELOCATABLE CLASSROOM BUILDINGS

PROJECT NUMBER: 1-16-02

CAJON VALLEY UNION SCHOOL DISTRICT

750 E. MAIN ST, EL CAJON, CA 92020

WWW.CAJONVALLEY.NET

MAGNOLIA ELEMENTARY SCHOOL

650 GREENFIELD DR,

EL CAJON, CALIFORNIA 92021

PREPARED BY:

ARCHITECT

RUHNAU CLARKE ARCHITECTS

3775 Tenth Street, Riverside CA 92501 - 5751 Palmer Way, Suite C, Carlsbad, CA 92010

951.684.4664 - 760.438.5899

www.ruhnaucclarke.com

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Project Title Page 00 01 01 - 1
---	--	------------------------------------

NOTICE: This Project Manual, is an unpublished instrument of service of the authors.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).

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Project Title Page 00 01 01 - 2
---	--	------------------------------------

**SECTION 00 01 02
PROJECT INFORMATION**

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

- A. Project Name: Relocatable Classroom Buildings, located at:
Magnolia Elementary School
650 Greenfield Drive,
El Cajon, California 92021
- B. The Owner, hereinafter referred to as District:
Cajon Valley Union School District
850 E. Main Street, El Cajon, California 92020
www.cajonvalley.net

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: Relocation of existing relocatable classroom buildings on same existing campus.
- 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**
3775 Tenth Street, Riverside CA 92501 - 5751 Palmer Way, Suite C, Carlsbad, CA 92010
www.ruhnauclarke.com
951.684.4664 - 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. Contract Time: To be stated in bid documents.
- D. 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:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Project Information 00 01 02 - 1
---	--	-------------------------------------

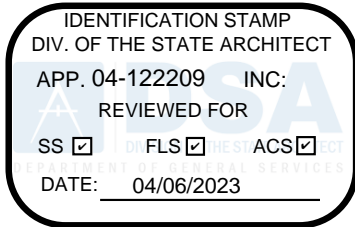
1. From District at the Project Manager's address listed above.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Project Information 00 01 02 - 2
---	--	-------------------------------------

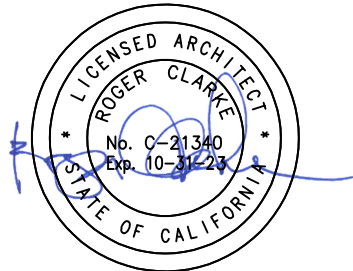


**SECTION 00 01 07
SEALS PAGE**

ARCHITECT OF RECORD (AOR)

RUHNAU CLARKE ARCHITECTS

3775 Tenth Street, Riverside CA 92501 - 5751 Palmer Way, Suite C, Carlsbad, CA 92010
 Roger Clarke, Architect of Record C-21340



ELECTRICAL ENGINEER OF RECORD (EEOR)

JOHNSON CONSULTING ENGINEERS, INC.

12875 Brookprinter Place, #300, Poway CA 92064
 Monica Goese-Hansen E-14781



CIVIL ENGINEER OF RECORD (CEOR)

CROSS CIVIL ENGINEERING

4653 Carmel Mountain Rd. Suite 308, San Diego CA 92130
 Jeff Reno Cross C-67530



END OF SEALS PAGE

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Seals Page 00 01 07 - 1
---	--	----------------------------

**SECTION 00 01 10
TABLE OF CONTENTS**

PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS

- 00 01 01 - Project Title Page
- 00 01 02 - Project Information
- 00 01 07 - Seals Page
- 00 01 10 - Table of Contents
- 00 40 25 - Request for Information
- 00 43 25 - Substitution Request Form - During Procurement
- 00 63 25 - Substitution Request Form - During Construction

SPECIFICATIONS

DIVISION 01 -- GENERAL REQUIREMENTS

- 01 10 00 - Summary
- 01 20 00 - Price and Payment Procedures
- 01 25 00 - Substitution Procedures
- 01 30 00 - Administrative Requirements
 - 01 30 00.01 - Request for Interpretation
- 01 35 50 - Requests for Electronic Files
- 01 35 53 - Security Procedures
- 01 40 00 - Quality Requirements
- 01 41 00 - Regulatory Requirements
- 01 42 19 - Reference Standards
- 01 45 33 - Code-Required Special Inspections
- 01 50 00 - Temporary Facilities and Controls
- 01 60 00 - Product Requirements
- 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions
 - 01 61 16.01 - Accessory Material VOC Content Certification Form
- 01 70 00 - Execution and Closeout Requirements
- 01 71 23 - Field Engineering
- 01 74 19 - Construction Waste Management and Disposal
- 01 78 00 - Closeout Submittals
 - 01 78 00.01 - Warranty Form Letter

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Table of Contents 00 01 10 - 1
---	--	-----------------------------------

A. 01 78 39 - Project Record Documents

DIVISION 02 -- EXISTING CONDITIONS

02 41 00 - Demolition

02 43 00 - Structure Moving

DIVISION 07 -- THERMAL AND MOISTURE PROTECTION

07 92 00 - Joint Sealants

DIVISION 09 -- FINISHES

09 72 60 – Resilient Tackable Wall Covering

DIVISION 26 -- ELECTRICAL

26 01 00 – General Provisions

26 05 19 – Power Conductors

26 05 26 – Grounding

26 05 33 – Conduit and Fittings

26 05 34 – Outlet and Junction Boxes

26 09 23 – Digital Lighting Control System

26 24 16 – Panelboards

26 27 26 – Switches and Receptacles

26 51 14 – LED Lighting Fixtures and Lamps

26 90 90 – Electrical Closeout

DIVISION 27 -- COMMUNICATIONS

27 01 00 – General Provisions

27 10 00 – Voice Data Infrastructure

27 20 00 – Integrated Audio-Visual System

27 51 16 – Intercom/ Clock System

DIVISION 28 -- ELECTRONIC SAFETY AND SECURITY

28 01 00 – General Provisions

28 13 00 – Security Systems

28 30 00 – Fire Alarm Voice Evacuation System

DIVISION 31 -- EARTHWORK

31 10 00 - Site Clearing

31 22 00 - Grading

31 23 16.13 - Trenching

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Table of Contents 00 01 10 - 2
---	--	-----------------------------------

DIVISION 32 -- EXTERIOR IMPROVEMENTS

32 11 23 - Aggregate Base Courses

32 12 16 - Asphalt Paving

END OF SECTION

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Table of Contents 00 01 10 - 3</p>
--	--	---

**SECTION 00 40 25
REQUEST FOR INFORMATION**

RFI NUMBER: _____ **DATE:** _____

PROJECT NAME: MAGNOLIA ELEMENTARY SCHOOL - RELOCATABLES PROJECT NO.: 1-16-02

TO: RUHNAU CLARKE ARCHITECTS

Construction Manager

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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Request for Information 00 40 25 - 1
---	--	---

END OF RFI

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Request for Information 00 40 25 - 2
---	--	---

**SECTION 00 43 25
SUBSTITUTION REQUEST FORM - DURING PROCUREMENT**

SUBSTITUTION REQUEST NO. _____

DATE: _____

PROJECT NAME: MAGNOLIA ELEMENTARY SCHOOL - RELOCATABLES

PROJECT NUMBER: 1-16-02

TO: RUHNAU CLARKE ARCHITECTS
Construction Manager

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

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

Explain _____

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

Explain _____

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Substitution Request Form - During Procurement 00 43 25 - 1
---	--	---

- E. Does proposed substitution require changes in Drawings or design and installation changes?
 No ___ Yes ___ _____
 (If yes, cost of these changes is the responsibility of the Contractor.)
- F. Does proposed substitution affect product cost, delivery time, or construction schedule?
 No ___ Yes ___ Explain _____
- G. Does proposed substitution comply with specified ICC Number, UL Rating, ASTM Numbers?
 No ___ Yes ___ Explain _____
- H. Does proposed substitution affect other trades and systems such as wiring, piping, ductwork, structure, etc.? No ___ Yes ___ (Explain which and how) _____

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

Attach a listing of 3 similar 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.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Substitution Request Form - During Procurement 00 43 25 - 2
---	--	---

**SECTION 00 63 25
SUBSTITUTION REQUEST FORM - DURING CONSTRUCTION**

SUBSTITUTION REQUEST NO. _____

DATE: _____

PROJECT NAME: MAGNOLIA ELEMENTARY SCHOOL - RELOCATABLES

PROJECT NUMBER: 1-16-02

TO: RUHNAU CLARKE ARCHITECTS
Construction Manager

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.)

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Substitution Request Form - During Construction 00 63 25 - 1
---	--	--

- 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

DSA Date

District Date

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Substitution Request Form - During Construction 00 63 25 - 2
---	--	--

**SECTION 01 10 00
SUMMARY**

PART 1 GENERAL

1.01 PROJECT

- A. Project Name: Magnolia Elementary School – Relocatable Classroom Buildings
- B. District's Name: Cajon Valley Union School District
- C. Architect's Name: Ruhnau Clarke Architects.
- D. The Project consists of the relocation of existing relocatable buildings, new PC ramps, and related sitework located at Magnolia Elementary 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 the relocation of three existing relocatable buildings , CBC, Occupancy Type Educational Group E, Construction Type V-B, , totaling approximately 3,840 square feet.

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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Summary 01 10 00 - 1
---	--	-------------------------

- 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. Electrical Power and Lighting: Alter existing system and add new construction, keeping existing in operation.
- E. Fire Suppression Sprinklers: Alter existing system and add new construction, keeping existing in operation.
- F. Telephone: Alter existing system and add new construction, keeping existing in operation.
- G. Security System: Alter existing system and add new construction, keeping existing in operation.
- H. 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:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Summary 01 10 00 - 2
---	--	-------------------------

- 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.
- 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.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p style="text-align: right;">Summary 01 10 00 - 3</p>
--	--	---

- 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.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p style="text-align: right;">Summary 01 10 00 - 4</p>
--	--	---

- 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 local ordinances.
- 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.

1.10 SPECIFICATION SECTIONS APPLICABLE TO ALL CONTRACTS

- A. Unless otherwise noted, all provisions of the sections listed in Division 01 apply to all contracts. Specific items of work listed under individual contract descriptions constitute exceptions.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Summary 01 10 00 - 5
---	--	-------------------------

**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. Submit Schedule of Values in duplicate within 15 days after date established in Notice to Proceed.
 - 1. Submit schedule in a spreadsheet calculated format, such as Excel, based upon the attached Schedule of Values augmented by the Table of Contents of this Project Manual.
- C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification section. Identify site mobilization, bonds and insurance, and record drawings .
- D. Where work is separated into phases requiring separately phased payments, provide separate schedule for each phase.
- E. Where work involves multiple sites and/or "A" number, provide separate schedules for each site and/or "A" number.
- F. Where scope of work involves multiples buildings/structures, provide separate schedule for each building.
- G. Include in each line item, the amount of Allowances specified in this section.
- H. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.
- I. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Price and Payment Procedures 01 20 00 - 1
---	--	--

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 Form as provided by District.
- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Price and Payment Procedures 01 20 00 - 2
---	--	--

- 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 (Project City).
- B. These documents may or may not have approved by the (Project City) 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Price and Payment Procedures 01 20 00 - 3
---	--	--

- 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 Directive approval is required from DSA prior to installation.
 - 4. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Price and Payment Procedures 01 20 00 - 4
---	--	--

- 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 6000.
 - 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Price and Payment Procedures 01 20 00 - 5
---	--	--

- 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 DSA 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Price and Payment Procedures 01 20 00 - 6
---	--	--

- 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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Price and Payment Procedures 01 20 00 - 7
---	--	--

**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 01 30 00 - Administrative Requirements: Submittal procedures, coordination.
- C. Section 01 60 00 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.
- D. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Substitution Procedures 01 25 00 - 1
---	--	---

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:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Substitution Procedures 01 25 00 - 2
---	--	---

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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Substitution Procedures 01 25 00 - 3
---	--	---

- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Substitution Procedures 01 25 00 - 4
---	--	---

- (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. Submittal Time Restrictions:
 - 1. District will consider requests for substitutions only if submitted at least 10 days prior to the date for receipt of bids.
- B. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period, and the documents required.
- C. 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 .
- D. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Substitution Procedures 01 25 00 - 5
---	--	---

- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Substitution Procedures 01 25 00 - 6
---	--	---

- 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.
 - 1. Substitutions affecting DSA-regulated items shall be considered as construction change documents (CCD's) and shall be approved by DSA prior to construction per DSA IR A-6 and Section 338(c) Part 1, Title 24 CCR. See Section 01 20 00 - Price and Payment Procedures.

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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Substitution Procedures 01 25 00 - 7
---	--	---

**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. Contractor's daily reports.
- G. Progress photographs.
- H. Number of copies of submittals.
- I. Requests for Interpretation or Information (RFI) procedures.
- J. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: General product requirements.
- B. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.
- C. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.
- D. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 1
---	--	---

- 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. Manufacturer's instructions and field reports.
 - 6. Applications for payment and change order requests.
 - 7. Progress schedules.
 - 8. Coordination drawings.
 - 9. Correction Punch List and Final Correction Punch List for Substantial Completion.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 2
---	--	---

10. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 3
---	--	---

3.02 PRECONSTRUCTION MEETING

- A. District will schedule a meeting after Notice of Award.
- B. Attendance Required:
 - 1. District.
 - 2. Architect.
 - 3. Contractor.
 - 4. Construction Manager.
- 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. Project Coordinator will schedule meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
 - 1. Contractor.
 - 2. District.
 - 3. Architect.
 - 4. Construction Manager.
 - 5. Special consultants.
 - 6. Contractor's superintendent.
 - 7. Major subcontractors.
 - 8. Inspector of Record.
 - 9. DSA Field Representative.
- C. Agenda:
 - 1. Designation of Key Personnel: Contractor shall designate key personnel and provide a name and address list which includes the following:
 - a. Contractor: Project Manager and Superintendent.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 4
---	--	---

- b. Major subcontractors: Principal/Project Manager and Superintendent.
 - c. Major materials suppliers: Contact person.
- 2. Distribute and discuss list of subcontractors and suppliers.
- 3. 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.
- 4. 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.
- 5. 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.
- 6. District's requirements.
- 7. Construction facilities and controls provided by District.
- 8. Temporary utilities provided by District.
- 9. Survey and building layout.
- 10. Security and housekeeping procedures.
- 11. 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 (OFCl) products;
 - c. Work under separate contracts by serving utility agencies;
 - d. Work under separate contracts by companies and District.
- 12. Review requirements for Contractor's coordination of Work; review sequence and schedule for work being performed for District under separate contracts.
- 13. Submittals Administration: Review administrative procedures for shop drawings, product data and samples submittals and review of preliminary Submittals Schedule.
- 14. Materials and Equipment:
 - a. Review substitution requirements;
 - b. Review schedule for major equipment purchases and deliveries;
 - c. Review materials and equipment to be provided by District (OFCl products).
- 15. Permits and Fees: Review Contract requirements and review schedule and process for obtaining permits and paying fees.
- 16. Application for payment procedures.
- 17. Procedures for testing.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 5
---	--	---

- a. Review tests and inspections to be performed by the following:
 - 1) Independent testing and inspection agency.
 - 2) Manufacturers and installers.
 - 3) Serving utilities and public agencies.
 - 4) Authorities having jurisdiction.
- 18. Procedures for maintaining record documents.
- 19. Requirements for start-up of equipment.
 - a. Operation and Maintenance Data:
 - 1) Format and content of operation and maintenance manuals; instruction of District's personnel.
- 20. 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. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Meeting Time and Location: As mutually agreed by District, Architect, and Contractor, at on-site location.
- D. 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.
- E. Attendance Required:
 - 1. Contractor.
 - 2. District.
 - 3. Architect.
 - 4. Construction Manager.
 - 5. Special consultants.
 - 6. Contractor's superintendent.
 - 7. Major subcontractors.
 - 8. Inspector of Record.
- F. Agenda:
 - 1. Review minutes of previous meetings.
 - a. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 6
---	--	---

- b. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
 - c. Challenge to minutes shall be settled as priority portions of "old business" at the next regularly scheduled meeting.
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.
- G. 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. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.
- B. Contractor's Review: All schedules shall be reviewed and approved by Contractor prior to submission for Architect's and District's review.
- C. Reviews by Architect and District 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.
- D. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- E. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- F. Within 10 days after joint review, submit complete schedule.
- G. Submit updated schedule with each Application for Payment.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 7
---	--	---

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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 8
---	--	---

- 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. Photo CD(s): Provide 1 copy including all photos cumulative to date and PDF file(s), with files organized in separate folders by submittal date.
 - 6. Hard Copy: Printed hardcopy (grayscale) of PDF file and point of view sketch.

3.08 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 9
---	--	---

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)

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 10
---	--	--

- 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;

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 11
---	--	--

- 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.

3.09 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 12
---	--	--

- 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.
 - a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.
 - b. Allow time for shipping and distribution to involved parties. Minimum 1 day, including those sent by electronic transmission.
- 6. Posting: Post one copy of most recent Submittals Schedule in Contractor's field office, readily available to District, Construction Manager, and Architect. Update bi-weekly with project schedule.
- 7. Archive: Preserve a minimum of two copies of all superseded schedules, with one copy available at field office for review by District or Architect.

3.10 SUBMITTALS FOR COMMISSIONING

- A. The Commissioning Authority will receive a copy of the standard submittals for equipment to be commissioned.
- B. The Commissioning Authority may require additional documentation necessary for the commissioning process. The Contractor will receive a written request from the Commissioning Authority for specific equipment or system information.

3.11 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 13
---	--	--

- 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.

3.12 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 14
---	--	--

- 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.
 - c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Architect's approval, allow an additional 30 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:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 15
---	--	--

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.

3.13 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", "Reviewed", or language with same legal meaning.
 - b. "Approved as Noted, Resubmission not required", or language with same legal meaning.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 16
---	--	--

- 1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
- c. "Approved as Noted, Resubmit for Record", "Reviewed 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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Administrative Requirements 01 30 00 - 17
---	--	--

**SECTION 01 30 00.01
REQUEST FOR INTERPRETATION**

RFI NUMBER: _____

DATE: _____

PROJECT NAME: MAGNOLIA ELEMENTARY SCHOOL - RELOCATABLES PROJECT NO.: 1-16-02

TO: RUHNAU CLARKE ARCHITECTS

3775 Tenth Street, Riverside CA 92501 - 5751 Palmer Way, Suite C, Carlsbad, CA 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: _____

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Request for Interpretation 01 30 00.01 - 1
---	--	---

Organization: _____

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

END OF RFI

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Request for Interpretation 01 30 00.01 - 2
---	--	---

**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.

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, 3775 Tenth Street, Riverside CA 92501 - 5751 Palmer Way, Suite C, Carlsbad, CA 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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Requests for Electronic Files 01 35 50 - 1
---	--	---

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Requests for Electronic Files 01 35 50 - 3
---	--	---

**SECTION 01 35 53
SECURITY PROCEDURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.03 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.

1.04 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.

1.05 RESTRICTIONS

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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Security Procedures 01 35 53 - 1
---	--	-------------------------------------

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Security Procedures 01 35 53 - 2
---	--	-------------------------------------

**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. Contractor's design-related professional design services.
- F. Control of installation.
- G. Mock-ups.
- H. Tolerances.
- I. Manufacturers' field services.
- J. 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 45 33 - Code-Required Special Inspections: Testing laboratory services and inspections required by Division of the State Architect (DSA), during the course of construction.
- D. 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:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Quality Requirements 01 40 00 - 1
---	--	--------------------------------------

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 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Base design on performance and/or design criteria indicated in individual specification sections.
- C. Scope of Contractor's Professional Design Services: Provide for the following items of work:
 1. Structural Design of Formwork: As described in Section 03 10 00 - Concrete Forming and Accessories.
 2. Concrete Mix Design: As described in Section 03 30 00 - Cast-in-Place Concrete. No specific designer qualifications are required.

1.07 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Quality Requirements 01 40 00 - 2
---	--	--------------------------------------

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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Quality Requirements 01 40 00 - 3
---	--	--------------------------------------

- 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.

1.08 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Quality Requirements 01 40 00 - 4
---	--	--------------------------------------

- 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.

1.09 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. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM E699, ASTM C1021, ASTM C1077, ASTM C1093, ASTM D3740, and DSA.
 - 2. Laboratory Qualifications: Accredited by IAS according to IAS AC89.
 - 3. Laboratory: Authorized to operate in California.
 - 4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Quality Requirements 01 40 00 - 5
---	--	--------------------------------------

- 5. 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.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Quality Requirements 01 40 00 - 6</p>
--	--	---

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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Quality Requirements 01 40 00 - 7
---	--	--------------------------------------

- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Quality Requirements 01 40 00 - 8
---	--	--------------------------------------

- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Quality Requirements 01 40 00 - 9
---	--	--------------------------------------

- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Quality Requirements 01 40 00 - 10
---	--	---------------------------------------

- 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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Quality Requirements 01 40 00 - 11
---	--	---------------------------------------

**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 - 2022 California Administrative Code.
 - 2. Part 2, Title 24 CCR - 2022 California Building Code (CBC); Volumes 1 and 2.
 - a. Based on ICC (IBC) - ICC International Building Code, 2021.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Regulatory Requirements 01 41 00 - 1
---	--	---

3. Part 3, Title 24 CCR - 2022 California Electrical Code (CEC, NFPA 70-NEC 2020).
 4. Part 4, Title 24 CCR - 2022 California Mechanical Code (CMC).
 - a. Based on IAPMO (UMC) - Uniform Mechanical Code, 2021.
 5. Part 5, Title 24 CCR - 2022 California Plumbing Code (CPC).
 - a. Based on IAPMO (UPC) - Uniform Plumbing Code, 2021.
 6. Part 6, Title 24 CCR - 2022 California Energy Code.
 7. Part 9, Title 24 CCR - 2022 California Fire Code (CFC).
 - a. Based on ICC (IFC) - International Fire Code; 2021.
 8. Part 10, Title 24 CCR - 2022 California Existing Buildings Code.
 - a. Based on ICC (IEBC) - ICC International Existing Buildings Code, 2021.
 9. Part 11, Title 24 CCR - 2022 California Green Building Standards Code (CalGreen).
 10. Part 12, Title 24 CCR - 2022 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; current edition.
- G. Maintain on site during construction, a copy of California Codes and Regulations; Title 24, California Building Code, Parts 1 through 5.

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 - 2022 CBC (SFM) Chapter 35.
 2. California Electrical Code.
 - a. [Not used.]
 - 1) [Not used.]
 3. 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 - 2010 ADA Standards for Accessible Design.
- H. 29 CFR 1910 - Occupational Safety and Health Standards.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Regulatory Requirements 01 41 00 - 2
---	--	---

1.03 RELATED REQUIREMENTS

A. Section 01 40 00 - Quality Requirements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Regulatory Requirements 01 41 00 - 3
---	--	---

**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 .
- 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 - 2010 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Reference Standards 01 42 19 - 1
---	--	-------------------------------------

- 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.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Reference Standards 01 42 19 - 2</p>
--	--	--

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.

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 Structural Panels.
- C. PS 20 - American Softwood Lumber Standard.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Reference Standards 01 42 19 - 3
---	--	-------------------------------------

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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Reference Standards 01 42 19 - 4
---	--	-------------------------------------

**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 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.
- B. AISC 341 - Seismic Provisions for Structural Steel Buildings.
- C. AISC 360 - Specification for Structural Steel Buildings.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 1
---	--	---

- D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- F. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.
- G. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
- H. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete.
- I. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
- J. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
- K. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- L. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
- M. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing.
- N. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- O. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements.

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. Submit certification that Testing Agency is acceptable to AHJ.
 - 3. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 2
---	--	---

- 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
 - 2 Architect
 - 1 Structural Engineer
 - 1 Contractor
 - 1 District's Project Inspector
 - 1 Division of the State Architect
- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 3
---	--	---

- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 4
---	--	---

- 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-206: Anchor Load.
 - (f) DSA-208: High-Strength Bolt.
 - (g) DSA-210: Ultrasonic (NDT).
 - (h) DSA-250: Special Inspection(s).
 - (i) DSA-291: Laboratory Verified Report.
 - (j) DSA-292: Special Inspection(s) Verified Report(s).
- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 5
---	--	---

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.
 - 2. Testing Agency must possess DSA LEA Program acceptance.
- 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. .

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 6
---	--	---

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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 7
---	--	---

- 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. 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.
- C. 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: 2022 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.
 - c. Multipass Fillet Welds: Verify compliance with AWS D1.1/D1.1M and BHMA A156.31 ; continuous.
 - d. Single Pass Fillet Welds Less than 5/16 inch Wide: Verify compliance with AWS D1.1/D1.1M and BHMA A156.31; periodic.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 8
---	--	---

- e. Plug and Slot Welds: Verify compliance with AWS D1.1/D1.1M and BHMA A156.31; continuous.
- f. Single Pass Fillet Welds 5/16 inch or Greater: Verify compliance with AWS D1.1/D1.1M and BHMA A156.31; continuous.
- 3. 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.
- 4. 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.
- D. 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.
 - a. District's Inspector will inspect all reinforcement for concrete work for size, dimensions, locations and proper placement.
- C. Anchors Cast in Concrete: Verify compliance with ACI 318, 17.8.2; periodic.
- D. Bolts Installed in Concrete: Where allowable loads have been increased or where strength design is used, verify compliance with approved Contract Documents and ICC-ES AC308 approved report prior to and during placement of concrete; continuous.
 - 1. Comply with CBC Section 1910A.5; Table 1705A.3, items 4a & 4b, ASCE 7, Section 13.4.
- 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.
 - 1. Portland Cement Tests: CBC 1705A.3.2, 1910A.1.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 9
---	--	---

2. Concrete Aggregates: CBC 1705A.3.2, 1903A.5.
 3. Batch Plant Inspection: CBC 1705A.3.3.
 4. Waiver of Continuous Batch Plant Inspection and Tests: CBC 1705A.3.3.1.
 5. Admixtures: CBC 1910A.1.
 6. Proportions of Concrete: CBC 1904A (Durability) and 1905A (Modifications to ACI 318).
- 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, 1905A.1.15, 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. 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. See also subparagraph on Waiver of Continuous Batch Plant Inspection above.
 6. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 10
---	--	--

- 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.
- 7. 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.
- 8. Make and store cylinders according to ASTM C31/C31M.
- 9. Deliver cylinders to laboratory or store cylinders in a suitable protected environment for pick up by laboratory personnel.
- 10. 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 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,):
 - 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 11
---	--	--

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.

3.05 SPECIAL INSPECTIONS FOR CAST-IN-PLACE DEEP FOUNDATIONS

- A. Materials, Equipment and Final Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
 1. Element length; continuous.
 2. Element diameters and bell diameters; continuous.
 3. Embedment into bedrock; continuous.
 4. End bearing strata capacity; continuous.
 5. Placement locations and plumbness; continuous.
 6. Type and size of hammer; continuous.
- B. Drilling Operations: Observe and maintain complete and accurate records for each element; continuous.
- C. Material Volume: Record concrete and grout volumes.
- D. Concrete Elements Associated with Cast-in-Place Deep Foundations: Perform additional inspections as required by the Special Inspections for Concrete Construction article of this section.

3.06 SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE

- A. Seismic Force-Resisting Systems: Comply with the quality assurance plan requirements of AISC 341.
- B. Inspection: Comply with CBC 1705A.12.
- C. Testing: Comply with CBC 1705A.13.
- D. Structural Steel: Comply with the quality assurance plan requirements of AISC 341.
- E. 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.
- F. Designated Seismic System Verification: Verify label, anchorage or mounting complies with certificate of compliance provided by manufacturer or fabricator.
- G. Structural Testing for Seismic Resistance:
 1. Concrete reinforcement: Comply with ACI 318, Section 20.2.2.5 and 21.1.52.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 12
---	--	--

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

3.07 SPECIAL INSPECTIONS FOR WIND RESISTANCE

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

3.08 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.

3.09 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:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 13
---	--	--

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.

3.10 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.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Code-Required Special Inspections 01 45 33 - 14</p>
--	--	---

- 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:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 15
---	--	--

- 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”)

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Code-Required Special Inspections 01 45 33 - 16</p>
--	--	---

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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 17
---	--	--

- 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

3.11 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 18
---	--	--

- (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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 19
---	--	--

- (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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 20
---	--	--

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.

3.12 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 21
---	--	--

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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Code-Required Special Inspections 01 45 33 - 22
---	--	--

**SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

- A. Section 01 35 53 - Security Procedures

1.03 REFERENCE STANDARDS

1.04 TEMPORARY UTILITIES

- A. Provide and pay for all electrical power, lighting, and water required for construction purposes.
- B. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.05 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
 - 1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
 - 2. Telephone Land Lines: One line, minimum; one handset per line.
 - 3. Internet Connections: Minimum of one; DSL modem or faster.
 - 4. Email: Account/address reserved for project use.

1.06 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Temporary Facilities and Controls 01 50 00 - 1
---	--	---

1.07 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.

1.08 FENCING

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

1.09 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.

1.10 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.

1.11 SMOKING AND TOBACCO

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

1.12 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.

1.13 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.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Temporary Facilities and Controls 01 50 00 - 2</p>
--	--	--

- 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.

1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment 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

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Temporary Facilities and Controls 01 50 00 - 3</p>
--	--	--

**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. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations.
- F. Procedures for District-supplied products.
- G. 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. Technical Specifications Sections.

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. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Product Requirements 01 60 00 - 1
---	--	--------------------------------------

- 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.
- B. Manufacturer's Inventory of Product Content: Publicly available inventory of every ingredient identified by name and Chemical Abstract Service Registration Number (CAS RN).
 - 1. For ingredients considered a trade secret or intellectual property, the name and CAS RN may be omitted, provided the ingredient's role, amount, and GreenScreen Benchmark are given.

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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Product Requirements 01 60 00 - 2
---	--	--------------------------------------

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.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Product Requirements 01 60 00 - 3</p>
--	--	---

- 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 regarding construction interfacing and coordination.

2.03 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the District, or otherwise indicated as to remain the property of the District, become the property of the Contractor; remove from site.

2.04 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Product Requirements 01 60 00 - 4
---	--	--------------------------------------

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 _____ include lugs for terminal box.

2.05 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Product Requirements 01 60 00 - 5
---	--	--------------------------------------

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:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Product Requirements 01 60 00 - 6
---	--	--------------------------------------

- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Product Requirements 01 60 00 - 7
---	--	--------------------------------------

2. The Architect will select color, pattern and texture from the product line of submitted manufacturer, if all other specified provisions are met.

2.06 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Product Requirements 01 60 00 - 8
---	--	--------------------------------------

- 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.
 - 1. Execute a formal supplemental agreement between District and Contractor allowing off-site storage, for each occurrence.
- K. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Product Requirements 01 60 00 - 9
---	--	--------------------------------------

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 Completion review. Refer to additional requirements specified in General Conditions along with Section 01 50 00 - Temporary Facilities and Controls and Section 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 Completion review of the Work.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Product Requirements 01 60 00 - 10
---	--	---------------------------------------

- C. Comply with additional requirements specified in Section 01 50 00 - Temporary Construction Facilities and Controls.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Product Requirements 01 60 00 - 11
---	--	---------------------------------------

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

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements for VOC-Content-Restricted products.
- B. 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.

1.03 DEFINITIONS

- A. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
 - 1. Exterior paints and coatings.
 - 2. Exterior adhesives and sealants.
 - 3. Other products when specifically stated in the specifications.
- B. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- C. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

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. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board.
- D. GreenSeal GS-36 - Standard for Adhesives for Commercial Use.
- E. SCAQMD 1113 - Architectural Coatings.
- F. SCAQMD 1168 - Adhesive and Sealant Applications.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Volatile Organic Compound (VOC) Content Restrictions 01 61 16 - 1
---	--	---

- 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. 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.
- B. 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, 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Volatile Organic Compound (VOC) Content Restrictions 01 61 16 - 2
---	--	---

2.02 MATERIALS

- A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.
- B. 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".
- C. 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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Volatile Organic Compound (VOC) Content Restrictions 01 61 16 - 3
---	--	---

SECTION 01 61 16.01
ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Accessory Material VOC Content Certification Form 01 61 16.01 - 1
---	--	---

**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. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- H. 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.
- D. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.
- E. Section 01 45 33 - Code-Required Special Inspections: Construction oversight procedures by Division of the State Architect regarding the execution, approval, and closeout of this building project.
- F. Section 01 71 23 - Field Engineering: Additional requirements for field engineering and surveying work.
- G. Section 01 74 19 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
- H. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.
- I. Section 01 79 00 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections
- J. Section 02 41 00 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.
- K. Individual Product Specification Sections:
 - 1. Advance notification to other sections of openings required in work of those sections.
 - 2. Limitations on cutting structural members.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Execution and Closeout Requirements 01 70 00 - 1
---	--	--

1.03 REFERENCE STANDARDS

- A. CBC Ch. 11B - California Building Code-Chapter 11B.
- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Execution and Closeout Requirements 01 70 00 - 2
---	--	--

- 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. Protect site from puddling or running water.
- B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
 - 1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
- C. 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.
- D. 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, pneumatic hammers, air-operated nail guns, and diesel engines.
 - 2. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
- E. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- F. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Execution and Closeout Requirements 01 70 00 - 3
---	--	--

- 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. Coordinate completion and clean-up of work of separate sections.
- G. 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.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Execution and Closeout Requirements 01 70 00 - 4</p>
--	--	---

- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

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 electronic 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.

Magnolia Elementary School		Execution and Closeout
Relocatable Classroom Buildings		Requirements
RCA Project No. 1-16-02		01 70 00 - 5

- 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.
 - 4. Controlling lines and levels required for mechanical and electrical trades.
- 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 Ch. 11B Figure 11B-104. Dimensions that are not stated as "maximum" or "minimum" are absolute.
 - 2. Tolerances shall be per CBC Ch. 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 ASTM F477 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. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Execution and Closeout Requirements 01 70 00 - 6
---	--	--

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.
- C. 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 ; 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.
- D. 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.
- E. 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 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.
- F. 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.
- G. Refinish existing surfaces as indicated:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Execution and Closeout Requirements 01 70 00 - 7
---	--	--

- 1. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- H. Clean existing systems and equipment.
- I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- J. Do not begin new construction in alterations areas before demolition is complete.
- K. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Execution and Closeout Requirements 01 70 00 - 8
---	--	--

- 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. 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.
- M. 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 weekly 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. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.
- G. 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.
- H. Prohibit traffic from landscaped areas.
- I. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Execution and Closeout Requirements 01 70 00 - 9
---	--	--

3.10 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 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 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.

3.11 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Division 23 - HVAC.

3.12 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. Final Inspection Review Cleaning, General: Execute a thorough cleaning prior to Completion review by Architect and District. Employ experienced workers or professional cleaners for cleaning operations for final inspection 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.

Magnolia Elementary School		Execution and Closeout
Relocatable Classroom Buildings		Requirements
RCA Project No. 1-16-02		01 70 00 - 10

- 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 equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
 - F. Clean debris from area drains and drainage systems.
 - G. Clean site; sweep paved areas, rake clean landscaped surfaces.
 - H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Architect and District.
- B. Accompany District, Architect, and Construction Manager 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 Final Inspection review.
- C. Notify Architect when work is considered ready for Architect's Final inspection.
- D. 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 Final inspection.
 - 1. Final Application for Payment: In the Application for Payment that coincides with the date Final Inspection/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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Execution and Closeout Requirements 01 70 00 - 11
---	--	---

3. 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.
- E. Clearing and Cleaning: Prior to the Final Inspection review, Contractor shall conduct a thorough cleaning and clearing of the Project area, including removal of construction facilities and temporary controls.
- F. Inspection and Testing: Prior to the Final Inspection review, complete inspection and testing required for the Work, including securing of approvals by authorities having jurisdiction.
 1. Complete inspections and tests of electrical power and signal systems.
- G. District will occupy all of the building as specified in Section 01 10 00.
- H. Conduct Final 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, Electrical, 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 DSA, 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 Final Inspection review.
 2. Final Inspection 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.
 - a. Contractor shall provide three working days notice to Architect for requested date of Final Inspection meeting.
 - b. The Construction Manager, the Architect with Architect's / District's consultants, as authorized by the District, will attend the Final Inspection meeting.

Magnolia Elementary School		Execution and Closeout
Relocatable Classroom Buildings		Requirements
RCA Project No. 1-16-02		01 70 00 - 12

- 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, 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.
- I. Correct items of work listed in Final Correction Punch List and comply with requirements for access to District-occupied areas.
- J. Notify Architect when work is considered finally complete and ready for Architect's Final Inspection.
 - 1. Architect's Certification of 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.
- K. Complete items of work determined by Architect listed in executed Certificate of Completion.

3.14 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.

3.15 MAINTENANCE

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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Execution and Closeout Requirements 01 70 00 - 13
---	--	---

- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Project 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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Execution and Closeout Requirements 01 70 00 - 14
---	--	---

**SECTION 01 71 23
FIELD ENGINEERING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Field engineering services by Contractor.
- B. Land surveying services by Contractor.

1.02 DESCRIPTION OF SERVICES

- A. Specific services listed in this section are in addition to, and do not supersede, general Execution and Closeout Requirements.
- B. Sole responsibility for establishing all locations, dimensions and levels of items of work.
- C. Sole responsibility for provision of all materials required to establish and maintain benchmarks and control points, including batter boards, grade stakes, structure, and pipeline elevation stakes, and other items.
- D. Having a skilled instrument person(s) available on short notice when necessary for laying out the work.
- E. Keeping a transit, theodolite, or TST (total station theodolite with electronic distance measurement device); leveling instrument; and related implements such as survey rods and other measurement devices, at the project site at all times.
- F. Provision of facilities and assistance necessary for Architect to check lines and grade points placed by Contractor.
 - 1. Performance of excavation or embankment work until after all cross-sectioning necessary for determining payment quantities for Unit Price work have been completed and accepted by Architect.
- G. Preparation and maintenance of daily reports of activity on the work. Submission of reports containing key progress indicators and job conditions to Architect.
 - 1. Number of employees at the Site.
 - 2. Number employees at the Site for each of Contractor's subcontractors.
 - 3. Breakdown of employees by trades.
 - 4. Major equipment and materials installed as part of the work.
 - 5. Major construction equipment utilized.
 - 6. Location of areas in which construction was performed.
 - 7. Materials and equipment received.
 - 8. Work performed, including field quality control measures and testing.
 - 9. Weather conditions.
 - 10. Safety.
 - 11. Delays encountered, amount of delay incurred, and the reasons for the delay.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Field Engineering 01 71 23 - 1
---	--	-----------------------------------

- 12. Instructions received from Architect or District, if any.
- H. Preparation and maintenance of professional-quality, accurate, well organized, legible notes of all measurements and calculations made while surveying and laying out the work.
- I. Prior to backfilling operations, surveying - locating, and recording on a copy of Contract Documents - an accurate representation of buried work and Underground Facilities encountered.
- J. Setting up and executing time-lapse photography of construction activities.

1.03 REFERENCE STANDARDS

- A. FGDC-STD-007.1 - Geospatial Positioning Accuracy Standards - Part 1: Reporting Methodology.
- B. FGDC-STD-007.2 - Geospatial Positioning Accuracy Standards - Part 2: Standards for Geodetic Networks.
- C. FGDC-STD-007.4 - Geospatial Positioning Accuracy Standards - Part 4: Architecture, Engineering, Construction, and Facilities Measurement.
- D. SMACNA (SRM) - Seismic Restraint Manual Guidelines for Mechanical Systems.
- E. State Plane Coordinate System for California.

1.04 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.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Submit in addition to items required in Section 01 70 00 - Execution and Closeout Requirements.
- C. Informational Submittals: Submit the following:
 - 1. Field Engineering: Submit daily reports, with content as indicated in this section.
 - a. When requested by Architect, submit for Record documentation verifying accuracy of field engineering including, but not limited to, Contractor’s survey notes and field notes.
 - 2. Final property survey.

1.06 QUALITY ASSURANCE

- A. Field Engineer's Qualifications: As established in Section 01 70 00 - Execution and Closeout Requirements.
- B. Land Surveyor's Qualifications: As established in Section 01 70 00 - Execution and Closeout Requirements.
- C. Use adequate number of skilled and thoroughly-trained workers to perform the work of this section in a timely and comprehensive manner.
- D. Minimum accuracy for required work is as follows:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Field Engineering 01 71 23 - 2
---	--	-----------------------------------

1. Grade: Horizontal Tolerance: Plus or minus 0.5 feet, Vertical Tolerance: Plus or minus 0.05 feet.
2. Culverts and ditches: Horizontal Tolerance: Plus or minus 0.5 feet, Vertical Tolerance: Plus or minus 0.05 feet.
3. Structures: Horizontal Tolerance: Plus or minus 0.5 feet (location), Vertical Tolerance: Plus or minus 0.05 feet.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. Notify District’s Representative and Architect of any discrepancies immediately in writing before proceeding to lay out the work. Locate and protect existing benchmarks and base line. Preserve permanent reference points during construction.
- B. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify existing conditions.

3.02 FIELD ENGINEERING

- A. Maintain field office files, drawings, specifications, and record documents.
- B. Coordinate field engineering services with Contractor's subcontractors, installers, and suppliers as appropriate.
- C. Prepare layout and coordination drawings for construction operations.
- D. Check and coordinate the work for conflicts and interferences, and immediately advise Architect and District of all discrepancies of which Contractor is aware.
- E. Cooperate as required with Architect and District in observing the work and performing field inspections.
- F. Review and coordinate work on a regular basis with shop drawings and Contractor's other submittals.
- G. In general, match existing adjacent grades and maintain existing flow lines.
- H. Check the location, line and grade of every major element as the work progresses. Notify the Architect when deviations from required lines or grades exceed allowable tolerances. Include in such notifications a thorough explanation of the problem, and a proposed plan and schedule for remedying the deviation. Do not proceed with remedial work without District’s concurrence of the remediation plan.
- I. Check all formwork, reinforcing, inserts, structural steel, bolts, sleeves, piping, other materials and equipment for compliance with shop drawings and Contract Documents requirements.
- J. Check all bracing and shoring for structural integrity and compliance with designs prepared by the Contractor.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p style="text-align: right;">Field Engineering 01 71 23 - 3</p>
--	--	---

3.03 LAND SURVEYING

- A. General: Follow standards for geospatial positioning accuracy.
 - 1. FGDC-STD-007.1 as amended by Authority Having Jurisdiction.
 - 2. FGDC-STD-007.2 as amended by Authority Having Jurisdiction.
 - 3. FGDC-STD-007.4 as amended by Authority Having Jurisdiction.
- B. Coordinate survey data with the State Plane Coordinate System of California.
- C. Contractor is responsible for the restoration of all property corners and control monuments damaged or destroyed by construction-related activities. Any disturbed monuments must be replaced at Contractor’s expense by a surveyor licensed in California, and approved by the Architect.
 - 1. Temporarily suspend work at such points and for such reasonable times as the District may require for resetting monuments. The Contractor will not be entitled to any additional compensation or extension of time.

3.04 CONSTRUCTION SURVEYING

- A. General: Perform surveying as applicable to specific items necessary for proper execution of work.
 - 1. Alignment Staking: Provide alignment stakes at 50 foot intervals on tangent, and at 25 foot intervals on curves.
 - 2. Slope Staking: Provide slope staking at 50 foot intervals on tangent, and at 25 foot intervals on curves. Re-stake at every ten-foot difference in elevation.
 - 3. Structure: Stake out structures, including elevations, and check prior to and during construction.
 - 4. Pipelines: Stake out pipelines including elevations, and check prior to and during construction.
 - 5. Site Utilities: Stake out utility lines including elevations, and check prior to and during construction.
 - 6. Road: Stake out roadway elevations at 50 foot intervals on tangent, and at 25 foot intervals on curves.
 - 7. Cross-sections: Provide original, intermediate, and final staking as required, for site work and other locations as necessary for quantity surveys.
 - 8. Easement Staking: Provide easement staking at 50 foot intervals on tangent, and at 25 foot intervals on curves. If required by project conditions, provide wooden laths with flagging at 100 foot intervals.
 - 9. Record Staking: Provide permanent stake at each blind flange and each utility cap is provided for future connections. Use stakes for record staking of material(s) acceptable to Architect.
 - 10. Structural Frame: Upon completion, certify location and plumbness.
- B. Surveying to Determine Quantities for Payment.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Field Engineering 01 71 23 - 4
---	--	-----------------------------------

1. For each application for progress payment, perform such surveys and computations necessary to determine quantities of work performed or placed. Perform surveys necessary for Architect to determine final quantities of work in place.
 2. Notify Architect at least 24 hours before performing survey services for determining quantities. Unless waived in writing by Architect, perform quantity surveys in presence of Architect.
- C. Record Log: Maintain a log of layout control work. Record any deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used.
- D. Use by the Architect: The Architect may at any time use line and grade points and markers established by the Contractor. The Contractor's surveys are a part of the work and may be checked by the Architect at any time.
- E. Accuracy:
1. Establish Contractor's temporary survey references points for Contractor's use to at least second-order accuracy (e.g., 1:10000). Set construction staking used as a guide for the work to at least third-order accuracy (e.g., 1:5000). Provide the absolute margin for error specified below on the basis established by such orders.
 - a. Horizontal accuracy of easement staking: Plus or minus 0.1 feet.
 - b. Accuracy of other staking shall be plus or minus 0.04 feet horizontally and plus or minus 0.02 feet vertically.
 - c. Include an error analysis sufficient to demonstrate required accuracy in survey calculations.
 2. District reserves the right to check the Contractor's survey, measurements, and calculations. The requirement for accuracy will not be waived, whether this right is exercised or not.

3.05 SUPPORT AND BRACING

- A. General requirements: Design all support and bracing systems, if required. Provide for attachment to portions of the building structure capable of bearing the loads imposed. Design systems to not overstress the building structure.
- B. Seismic Bracing: Design where required by authorities having jurisdiction.
1. Design and install all support systems to comply with the seismic requirements of the Construction Code of California.
 2. Design and install seismic bracing so as not to defeat the operation on any required vibration isolation or sound isolation devices.
 3. For seismic bracing guidelines for mechanical, electrical and plumbing systems, refer to SMACNA (SRM).

3.06 REPORTS

- A. Submit two copies of Contractor's daily reports at Architect's field office (or electronically) by 9:00 AM the next working day after the day covered in the associated report. Daily report shall be signed by responsible member of Contractor's staff, such as project manager or superintendent, or foreman designated by Contractor as having authority to sign daily reports.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Field Engineering 01 71 23 - 5
---	--	-----------------------------------

3.07 RECORDS

- A. Maintain at the Site a complete and accurate log of control and survey work as it progresses.
 - 1. Organize and record survey data in accordance with recognized professional surveying standards, Laws and Regulations, and prevailing standards of practice in California. Record Contractor's surveyor's original field notes, computations, and other surveying data in Contractor-furnished hard-bound field books. Contractor is solely responsible for completeness and accuracy of survey work, and completeness and accuracy of survey records, including field books. Survey records,(including field books) may be rejected by District due to failure to organize and maintain survey records in a manner that allows reasonable and independent verification of calculations, and/or allows identification of elevations, dimensions, and grades of the work.
 - 2. Illegible notes or data, and erasures on any page of field books, are unacceptable. Do not submit copied notes or data. Corrections by ruling or lining out errors will be unacceptable unless initialed by the surveyor. Violation of these requirements may require re-surveying the data questioned by Architect.
- B. Submit three copies of final property survey to District. Include on the survey a certification, signed by the surveyor, that principal metes, bounds, lines, and levels of the Project are accurately positioned as shown on the survey. Include the following information:
 - 1. Structure locations from property lines, and distances to adjacent buildings.
 - 2. Dimensions and locations of drives, walks, walls, underground utilities, appurtenances, and major site features.
 - 3. Location of easements.
 - 4. Final grading topographic survey.

3.08 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.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Field Engineering 01 71 23 - 6
---	--	-----------------------------------

**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 65 percent 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. Land clearing debris, including brush, branches, logs, and stumps; see Section 31 10 00 - Site Clearing for use options.
 - a. Comply with California Green Code (CGC) 5.408.3; Excavated soil and land clearing debris: 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled.
 - 1) Exception: Reuse, either on-or off-site, of vegetation or soil contaminated by disease or pest infestation.
 - 6. Concrete: May be crushed and used as riprap, aggregate, sub-base material, or fill.
 - 7. Bricks: May be used on project if whole, or crushed and used as landscape cover, sub-base material, or fill.
 - 8. Concrete masonry units: May be used on project if whole, or crushed and used as sub-base material or fill.
 - 9. Asphalt paving: May be recycled into paving for project.
 - 10. 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.
 - 11. Glass.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Construction Waste Management and Disposal 01 74 19 - 1
---	--	---

12. Gypsum drywall and plaster.
13. 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.
14. Roofing.
15. Paint.
16. Plastic sheeting.
17. Rigid foam insulation.
18. Windows, doors, and door hardware.
19. Plumbing fixtures.
20. Mechanical and electrical equipment.
21. Fluorescent lamps (light bulbs).
22. Acoustical ceiling tile and panels.
23. 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.
 - 1.
- H. The following sources may be useful in developing the Waste Management Plan:
 1. California Recycling Department, at www.dgs.ca.gov/BSC/CALGreen.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Construction Waste Management and Disposal 01 74 19 - 2
---	--	---

2. General information contacts regarding construction and demolition waste:
 - a. Directory of Wood-Framed Building Deconstruction and Reused Building Materials Companies: www.fpl.fs.fed.us/documnts/fplgtr/fpl_gtr150.pdf.
 - b. 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) www.calrecycle.ca.gov.
 4. Recycling Economics Information: The above lists contain information that may be useful in estimating the costs or savings or recycling options.
- 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 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: List of items to be salvaged from the existing building for relocation in project or for District.
- B. Section 01 30 00 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.
- C. Section 01 50 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.
- D. Section 01 60 00 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.
- E. Section 01 70 00 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.
- F. Section 31 10 00 - Site Clearing: Handling and disposal of land clearing debris.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Construction Waste Management and Disposal 01 74 19 - 3
---	--	---

1.03 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.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Construction Waste Management and Disposal 01 74 19 - 4</p>
--	--	--

- 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.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Construction Waste Management and Disposal 01 74 19 - 5</p>
--	--	--

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.

1.04 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.
 - c. State the estimated net cost, versus landfill disposal.
 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Construction Waste Management and Disposal 01 74 19 - 6
---	--	---

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. Base conversion rate numbers 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, 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Construction Waste Management and Disposal 01 74 19 - 7
---	--	---

- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Construction Waste Management and Disposal 01 74 19 - 8
---	--	---

- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Construction Waste Management and Disposal 01 74 19 - 9
---	--	---

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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Construction Waste Management and Disposal 01 74 19 - 10
---	--	--

**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. District issued Bidding Instructions and Contract 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. Section 01 78 39 - Project Record Documents: Detailed requirements.
- F. Individual Product Sections: Specific requirements for operation and maintenance data.
- G. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Closeout Submittals 01 78 00 - 1
---	--	-------------------------------------

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. 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:
 - 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 to 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 final progress markup PDF documents by uploading via Bluebeam to Architect with claim for final Application for Payment.
- D. Warranties and Bonds:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Closeout Submittals 01 78 00 - 2
---	--	-------------------------------------

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 Technical Sections, 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Closeout Submittals 01 78 00 - 3
---	--	-------------------------------------

2. Contractor is 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 are in addition to implied warranties, and do 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. See also Section 01 78 39 - Project Record Documents.
- B. Record Documents are to be maintained and submitted in searchable live electronic format (PDF), unflattened.
 1. Develop in compliance with Section 01 30 00 - Administrative Requirements.
 2. Acceptable markup software:
 - a. Adobe Acrobat Professional.
 - b. Bluebeam Revu.
- C. 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.
- D. Ensure entries are complete and accurate, enabling future reference by District.
- E. Store record documents separate from documents used for construction.
- F. Record information concurrent with construction progress.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Closeout Submittals 01 78 00 - 4
---	--	-------------------------------------

- G. 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.

- H. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Reproducible (PDF) 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.
 - 7. Sketches, clarifications (RFI's), Field Orders, Supplemental Instructions, Construction Change Documents, and Approved Change Orders

- I. Submission: Submit by uploading, Record Documents to Architect prior to each Application for Payment.
 - 1. Provide, by email, to the Architect, a download link the Record Documents consisting of an unflattened PDF format with live text and redline mark-ups, not scanned.
 - 2. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Closeout Submittals 01 78 00 - 5
---	--	-------------------------------------

- 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 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Closeout Submittals 01 78 00 - 6
---	--	-------------------------------------

- 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.

3.05 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 Specifications Sections of Divisions 2 through 33 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Closeout Submittals 01 78 00 - 7
---	--	-------------------------------------

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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Closeout Submittals 01 78 00 - 8
---	--	-------------------------------------

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.

3.06 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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Closeout Submittals 01 78 00 - 9
---	--	-------------------------------------

**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 Relocatable Classroom - RCA Master 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) _____
(Typed Name) _____ (Date) _____
(Title) _____ (Firm) _____

CONTRACTOR:

State License No: _____
(signed) _____
(Date) _____ (Typed Name) _____
(Title) _____ (Firm) _____

FORM LETTER

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Warranty Form Letter 01 78 00.01 - 1
---	--	---

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 [__warranty__] [__guarantee__] that the portion of the Work described above which [__we have provided__] [__was provided by (Installer or Subcontractor's Name)__] for Relocatable Classroom - RCA Master 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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Warranty Form Letter 01 78 00.01 - 2
---	--	---

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Warranty Form Letter 01 78 00.01 - 3
---	--	---

**SECTION 01 78 39
PROJECT RECORD DOCUMENTS**

PART 1 - GENERAL

1.01 SUMMARY

- A. Record Drawings.
- B. Record Specifications.
- C. Record Product Data.
- D. Record Samples.
- E. Record Photos.
- F. Record Schedule of Values.
- G. Miscellaneous record submittals.

1.02 RELATED REQUIREMENTS:

- A. Section 01 20 00 - Price and Payment Procedures: Schedule of Values.
- B. Section 01 30 00 - Administrative Requirements: Project Coordination.
- C. Section 01 78 00 - Closeout Submittals: General Closeout.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Project Record Documents: Recorded actual locations.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 RECORD DRAWINGS

- A. Record Documents: Construction Manager is to maintain one set of electronically marked-up PDF copy of the Contract Drawings including Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark Record Drawings to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record document.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Project Record Documents 01 78 39 - 1
---	--	--

- e. Cross-reference Record Drawings to corresponding archive photographic documentation.
2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Field changes of dimensions from Contract Drawings.
 - b. Revisions to details shown on Contract Drawings.
 - 1) Details not on original Contract Drawings. Application of copies of details produced and provided by Architect during construction will be accepted.
 - c. Depths of foundations and footing, measured in relation to finish First Floor datum.
 - d. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent ground improvements.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuits.
 - g. Actual equipment locations and sizes.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Permanent Room names and Room numbers.
 - k. Changes made by Change Order or Construction Change Directive.
 - l. Changes made following written orders by District or Construction Manager.
 - m. Changes made following Architect's written orders.
 - n. Note clarifications from RFI's.
 - o. Field records for variable and concealed conditions.
 - p. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up Record Drawings.
 4. Mark Record sets with erasable, red text and graphics. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Contract Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before Final Inspection, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 - a. Format: PDF, Version, Microsoft Windows operating system.
 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Project Record Documents 01 78 39 - 2
---	--	--

3. Refer instances of uncertainty to Architect and Construction Manager for resolution.
 4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 01 35 50 - Requests for Electronic Files for requirements related to use of Architect's digital data files.
 - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 2. Consult Architect and Construction Manager for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared Record Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled. Do not flatten the document.
 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the section identification. Include identification in each digital data file.
 4. Identification:
 - a. Project name and number.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect and Construction Manager.
 - e. Name of Contractor.

3.02 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications in PART 2 to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Project Record Documents 01 78 39 - 3
---	--	--

- 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 - 5. Note related Change Orders, record Product Data, and Record Drawings, where applicable.
- B. Format: Submit Record Specifications as annotated PDF electronic file. Do not flatten the document.

3.03 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
- 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file. Do not flatten the document.
- 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

3.04 RECORD SAMPLES

- A. Immediately before date of Substantial Completion, meet with District or Construction Manager at Project site to determine which Samples maintained during the construction period are to be transmitted to District or Construction Manager for record purposes.
- B. Comply with District or Construction Manager's instructions for packaging, identification, marking, and delivery to District or Construction Manager's Sample storage space. Dispose of other Samples in the manner specified for disposing surplus and waste materials

3.05 RECORD PHOTOS

- A. Photograph all work before covering up, including:
- 1. The extent of all open trenches and manholes.
 - 2. Identify all exposed utilities in the photos.
 - 3. Show photograph locations and dates on Record Drawings.

3.06 RECORD SCHEDULE OF VALUES

- A. Provide a PDF copy of the final Schedule of Values as indicated in Section 01 20 00 - Price and Payment Procedures.

3.07 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Project Record Documents 01 78 39 - 4</p>
--	--	---

1. Field records on excavations and foundations.
 2. Field records on underground construction and similar work.
 3. Surveys showing locations and elevations of underground lines.
 4. Invert elevations of drainage piping.
 5. Surveys establishing building lines and levels.
 6. Authorized measurements using unit prices or allowances.
 7. Records of plant treatment.
 8. Ambient and substrate condition tests.
 9. Certifications received in lieu of labels on bulk products.
 10. Batch mixing and bulk delivery records.
 11. Testing and qualification of trade persons.
 12. Documented qualification of installation firms.
 13. Load and performance testing.
 14. Inspections and certifications by governing authorities.
 15. Leakage and water-penetration tests.
 16. Fire-resistance and flame-spread test results.
 17. Final inspection and correction procedures.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.
1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

3.08 SUBMISSION

- A. Keep Project Record Documents current, as they will be reviewed for completeness by Architect, Engineer, Project Inspector, and Construction Manager; as a condition of certification for each Progress Payment Application.
- B. Prior to the date of the Notice of Completion, submit marked Record Documents to Architect and Construction Manager for review, approval and further processing.

3.09 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Review of documents by Architect, Engineer, Project Inspector, or Construction Manager to be in concert with approval of the monthly Application for Payment.
- C. Maintenance of Record Documents and Samples:
 1. Store record documents and Samples in the field office apart from the Contract Documents used for construction.
 2. Do not use project record documents for construction purposes.
 3. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Project Record Documents 01 78 39 - 5
---	--	--

4. Provide access to project record documents for Architect and Construction Manager reference during normal working hours.

3.10 FINAL SUBMITTAL/CLOSEOUT

- A. Contractor is to provide a complete coordinated set of electronic PDF Record Documents to the Architect as part of the final closeout procedure.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Project Record Documents 01 78 39 - 6
---	--	--

**SECTION 02 41 00
DEMOLITION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Selective demolition of built site elements.
 - 1. Demolition and removal of existing site improvements within Project area, as indicated on Drawings and as necessary to accomplish the Work, including:
 - a. Asphaltic concrete and portland cement concrete paving.
 - b. Abandoned underground utility lines outside of utility easement.
 - c. Pavement cutting and removal.
 - d. Debris removal.
 - 2. Handling and disposal of removed materials.
 - 3. Dewatering of excavations as necessary to control surface and sub-surface water.

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 10 00 - Summary: Description of items to be salvaged or removed for re-use by Contractor.
- D. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- E. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- F. 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.
- G. Section 01 74 19 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.
- H. Section 31 10 00 - Site Clearing: Vegetation and existing debris removal.
- I. Section 31 22 00 - Grading: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.03 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction.
- B. CFC Ch. 33 - Fire Safety During Construction and Demolition.
- C. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Demolition 02 41 00 - 1
---	--	----------------------------

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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Demolition 02 41 00 - 2
---	--	----------------------------

- 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 DSA, 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 [_ District Name_], 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 DSA 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. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Demolition 02 41 00 - 3
---	--	----------------------------

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 SCOPE

- A. Remove paving and curbs as required to accomplish new work.
- B. Remove other items indicated, for salvage, relocation, and recycling.
- C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

3.02 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. Selective Demolition of Site and Building Elements:
 - 1. Use techniques acceptable to authorities having jurisdiction and which will achieve intended results and provide protection of surrounding features to remain.
 - 2. Some items may have been demolished prior to Work of this Contract. Verify existing conditions prior to start of demolition. If items are or have been demolished contact the Architect.
 - 3. Some items may require postponement of demolition until late in Contract Time period.
 - 4. Phase demolition as necessary to provide adequate interfacing of related Work.
 - 5. Demolish in an orderly and careful manner. Protect existing foundations, retaining walls, utility structures, other structures and finish materials to remain.
- C. 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 DSA, Project Inspector and Architect.
- D. Comply with other requirements specified in Section 01 70 00.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Demolition 02 41 00 - 4
---	--	----------------------------

- E. 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.
- F. 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. Temporary Construction: Remove indications of temporary construction facilities, such as haul roads, work areas, structures, stockpiles or waste areas.
 - 4. 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.
 - 5. 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.
 - 6. Noise Control: Perform demolition operations to minimize noise.
 - a. Provide equipment, sound-deadening devices, and take noise abatement measures that are necessary to comply with the requirements of this Contract.
 - b. 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.
- G. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Demolition 02 41 00 - 5
---	--	----------------------------

- 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 DSA.
 - 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.
- H. Do not begin removal until receipt of notification to proceed from District.
- I. Do not begin removal until built elements to be salvaged or relocated have been removed.
- J. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Demolition 02 41 00 - 6
---	--	----------------------------

- 5. Mark location of utilities.
- K. 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.
- L. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.
- M. 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.
- N. 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.
- O. Damages: Promptly repair damages to adjacent facilities caused by demolition operations.
- P. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Demolition 02 41 00 - 7
---	--	----------------------------

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

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Demolition 02 41 00 - 8
---	--	----------------------------

**SECTION 02 43 00
STRUCTURE MOVING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparing structure for move.
- B. Moving existing relocatable classroom building structure to new location.
- C. Setting structure on new foundation.
- D. Disconnecting and capping utilities at original location.
- E. Connecting utilities at new location.

1.02 RELATED REQUIREMENTS

- A. Section 02 41 00 - Demolition: Removal of existing foundation after structure removal.
- B. Section 31 22 00 - Grading: Rough and finish grading.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Arrange for route of move with authorities having jurisdiction and comply with its requirements for the move including, but not limited to, traffic control, police escorts, and relocation of overhead utility services in the route.
- B. Coordination: Ensure utilities at new location are ready for connection.
- C. Pre-Move Meeting: Convene one week before starting work of this section. Discuss the following:
 - 1. Method of determining damage to existing structure and finishes before and after the move.
 - 2. Identify existing damage to sidewalks, roads, and curbs.
 - 3. Method and responsibility for repairs after moving.
 - 4. Review the intended route for moving and dimensional clearances of obstructions.
 - 5. Coordination with affected utility companies.
 - 6. Coordination with authorities for permits, municipalities affected, and traffic control.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Project Record Documents: Record actual locations of new utilities and services, foundations .

1.05 QUALITY ASSURANCE

- A. Mover Qualifications: Company specializing in relocating building structures with minimum of five years of documented experience.
 - 1. Company specializing in moving portable classroom building structures.
 - 2. Current State of California Category C-21 license.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Structure Moving 02 43 00 - 1
---	--	----------------------------------

- B. Retain services of a Professional Structural Engineer experienced in this Work and licensed in California for the following:
 - 1. To investigate and provide documented report confirming load bearing capacity of roads over which structure will be moved.
 - 2. To design structural supports for existing structure and associated Work. Design framing, reinforcement, and brace connections to transfer loads of structure to transport carrying equipment.
- C. Insurance: Company must show proof of one million dollars (\$1,000,000.00) in general liability insurance.

1.06 REGULATORY REQUIREMENTS

- A. Conform to applicable municipal ordinances; obtain permits, licenses and pay deposit sums; arrange for route of move; disconnect and reconnect utility services on route.
- B. When relocation occurs off-site, arrange with authorities having jurisdiction for traffic control, police escorts, relocation of services and interim structure locations.

1.07 SCHEDULING

- A. Arrange schedule with District's requirements for sequence of work under this contract.
- B. No transporting of the relocatable buildings to any of the designated sites, neither any movement on site will be permitted no later than (30 min.) before and no earlier than (30 min.) after school hours.
- C. A school schedule stating times and activities for each school site will be issued at the Pre-Construction Meeting.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIALS

- A. Transport, Equipment, and Supports: As required to achieve a successful structure move.
- B. Fill Materials: As specified in Section 31 23 23.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Visit District' proposed sites, where shown on Drawings, for moving of portables, route of transport and sites of destination.
- B. Verify on-site surface load limits to ensure conditions are adequate to support moving loads of structure.
- C. Verify availability and accessibility of transport routes. Verify route load limits to ensure conditions are adequate to support moving loads of structure.
- D. Identify utility services and obstructions to be removed, relocated, or abandoned during progress of the Work.
- E. Inspect structure thoroughly and notify Architect in writing of visible defects, structural or otherwise, which would affect safe movement of structures to final location.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Structure Moving 02 43 00 - 2
---	--	----------------------------------

- F. Damage Determination:
 1. Before the move, inspect existing structure thoroughly and notify Architect in writing of visible defects and factors that could affect safe movement of structure to final location.
 2. Compile list of existing visible defects to building structure, finishes, accessories . This list will form the basis for determining required repair work after the move.
 3. Photograph for record purposes.
- G. Beginning work of this section means acceptance of existing conditions.

3.02 PREPARATION

- A. Prepare site, route of transport, and destination site.
- B. Protect road as necessary to safely move the structures and to prevent damage.
- C. Coordinate the work of utility disconnection and reconnection with the work of this section.
- D. Disconnect and cap existing site utility services. Remove overhead or exposed utility services to provide clear working and moving space around and below structure.
- E. Remove building protrusions prior to move.
- F. Secure supplementary framing and bracing to structure.
- G. Secure operating, moving, or suspended items such as doors, windows, cabinetry, and light fixtures in a manner to prevent damage to items or to the structure during move.
- H. Protect elements surrounding the structure from damage.

3.03 RAISE STRUCTURE

- A. Cut structure free of foundation and portions of structure not being moved.
- B. Reinforce, brace, and raise structure clear of foundation in manner to prevent damage.
- C. Provide necessary framing, bracing, closures, supports, and blocking.
- D. Secure structure to temporary supporting structural members to prevent shifting of structure during move.

3.04 MOVE STRUCTURE

- A. Provide transport vehicles for moving structure to new site.
- B. Move structure, control speed, and provide anchor and restraining devices to maintain the integrity of the structure.
- C. During move, protect adjacent structures, and private and public property from damage.

3.05 REINSTALL STRUCTURE

- A. Position and anchor structure over prepared foundation and lower onto new foundation.
 1. Anchor structure to foundation in accordance with Architectural / Manufacturer's Drawings.
- B. Attach individual units to each other at mod-lines to provide a complete building.
 1. Attach in accordance with Architectural / Manufacturer's Drawings.
 2. Provide all material requirements to attach units.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Structure Moving 02 43 00 - 3
---	--	----------------------------------

- C. Remove moving equipment.
- D. Leave reinforcing, framing, and bracing intact until structure is fully attached and structure loads are supported by new foundation.
- E. Reinstall building protrusions removed prior to move.

3.06 TOLERANCES

- A. Maximum Variation from Level and Plumb After Reinstallation: 1/4 inch.
- B. Maximum Offset from True Position After Reinstallation: 1/4 inch.
- C. Adjust structure on foundation:
 - 1. To permit doors to swing freely.
 - 2. So that floor surfaces are level, walls are plumb.

3.07 DAMAGE REPAIR

- A. Repair damage to structure not identified in writing prior to move.
 - 1. Repair or remove and replace with new material, damage which cannot be repaired to the satisfaction of the Architect.
- B. Refinish repaired surfaces to match adjacent work.
- C. Pay all third party claims for incidental or other damage.
- D. Refer to Section 01 70 00 - Execution and Closeout Requirements.

3.08 ORIGINAL SITE

- A. Original supports for structure shall be collected and turned over to District.

3.09 CLEANING

- A. Remove moving equipment and materials from original site, final site, and route of travel.
- B. Remove road base constructed by this section, fill and return grades and contours to original condition and dimension.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Structure Moving 02 43 00 - 4
---	--	----------------------------------

**SECTION 07 92 00
JOINT SEALANTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.
- D. 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.

1.03 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer.
- B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
- C. ASTM C1193 - Standard Guide for Use of Joint Sealants.
- D. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.
- E. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.

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.
- 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Joint Sealants 07 92 00 - 1
---	--	--------------------------------

- 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. 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. 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.
- E. 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.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p style="text-align: right;">Joint Sealants 07 92 00 - 2</p>
--	--	--

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.
- B. Self-Leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.
1. Adhesives Technology Corporation: www.atcepoxy.com.
 2. Bostik Inc: www.bostik-us.com.
 3. Dayton Superior Corporation: www.daytonsuperior.com.
 4. Dow Corning Corporation: www.dowcorning.com/construction/sle.
 5. Master Builders Solutions by BASF: www.master-builders-solutions.basf.us/en-us/#sle.
 6. Pecora Corporation: www.pecora.com.
 7. QUIKRETE Companies: www.quikrete.com/#sle.
 8. Sherwin-Williams Company: www.sherwin-williams.com.
 9. Sika Corporation: www.usa-sika.com.
 10. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
 11. W.R. Meadows, Inc: www.wrmeadows.com/sle.
 12. 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. Joints between door, window, and other frames and adjacent construction.
 - c. Joints between different exposed materials.
 - d. Openings below ledge angles in masonry.
 - e. Other joints indicated below.
 2. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Joint Sealants 07 92 00 - 3
---	--	--------------------------------

- e. Joints between suspended panel ceilings/grid and walls.
- B. Type CP-1 - Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane "traffic-grade" sealant.

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 ST-1 - Silyl-Terminated Polyether (STPE) and Polyurethane (STPU) Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 35 percent, minimum.
 - 2. Hardness Range: 20 to 40, Shore A, when tested in accordance with ASTM C661.
 - 3. Color: To be selected by Architect from manufacturer's full range.
 - 4. Service Temperature Range: Minus 40 to 180 degrees F.
 - 5. Manufacturers:
 - a. Sherwin-Williams Company; Stampede 100 Low-Modulus Hybrid Urethane Sealant: www.sherwin-williams.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. 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.
- C. Non-Sag "Traffic-Grade" Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.
 - 1. Movement Capability: Plus and minus 25 percent, minimum.
 - 2. Hardness Range: 40 to 50, Shore A, when tested in accordance with ASTM C661.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p style="text-align: right;">Joint Sealants 07 92 00 - 4</p>
--	--	--

3. Color: To be selected by Architect from manufacturer's full range.
4. Service Temperature Range: Minus 40 to 180 degrees F.

2.05 SELF-LEVELING SEALANTS

- A. Self-Leveling Silicone Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
 1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
 2. Hardness Range: 0 to 15, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's full range.
 4. Service Temperature Range: Minus 40 to 180 degrees F.
 5. Manufacturers:
 - a. Sika Corporation; Sikasil 728SL: www.usa-sika.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
 6. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
 7. Color: To be selected by Architect from manufacturer's full range.
 8. Service Temperature Range: Minus 40 to 180 degrees F.
 9. Manufacturers:
 - a. Pecora Corporation: www.pecora.com.
 - b. Sherwin-Williams Company; Stampede 1SL Polyurethane Sealant: www.sherwin-williams.com/#sle.
 - c. Sika Corporation; Sikaflex-1c SL: www.usa-sika.com/#sle.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Self-Leveling Polysulfide Sealant: ASTM C920, Grade P, Uses M and A; multicomponent; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
 1. Movement Capability: Plus and minus 25 percent.
 2. Hardness Range: 30 to 55, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's full range.
 4. Service Temperature Range: Minus 40 to 180 degrees F.
 5. Manufacturers:
 - a. W.R. Meadows, Inc; Deck-O-Seal (pourable): www.wrmeadows.com/#sle.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Rigid Self-Leveling Polyurethane Joint Filler: Two part, low viscosity, fast setting; intended for cracks and control joints not subject to significant movement.
 1. Hardness Range: Greater than 100, Shore A, and 50 to 80, Shore D, when tested in accordance with ASTM C661.
 2. Manufacturers:
 - a. ARDEX Engineered Cements; ARDEX ARDIFIX: www.ardexamericas.com/#sle.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Joint Sealants 07 92 00 - 5
---	--	--------------------------------

- b. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 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. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
 - 3. 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. Record each test on Preinstallation Adhesion Test Log as indicated.
 - 4. 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.
 - 5. 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.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Joint Sealants 07 92 00 - 6
---	--	--------------------------------

- 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.

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. 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.
- D. Install bond breaker backing tape where backer rod cannot be used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- F. 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.
- G. 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.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Joint Sealants 07 92 00 - 7
---	--	--------------------------------

**SECTION 09 72 60
RESILIENT TACKABLE WALL COVERING**

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Resilient cork/linoleum tackable wall covering (TWP-1).
- B. Surface preparation and prime painting.
- C. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 91 23 - Interior Painting: Preparation and priming of substrate surfaces.
- C. Section 10 11 00 - Visual Display Units: Prefabricated, framed tackboards and markerboards.

1.03 REFERENCE STANDARDS

- A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. ASTM F2034 - Standard Specification for Sheet Linoleum Floor Covering.
- D. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on wall covering and adhesive.
- C. Shop Drawings: Indicate wall elevations with seaming layout.
- D. Samples: Submit two samples of wall covering, 7 x 9 inch in size illustrating color, finish, and texture of each type of tackable wallcovering material required.
- E. Test Reports: Indicate verification of flame and smoke ratings, when tested by UL.
- F. Manufacturer's Installation Instructions: Indicate special procedures.
- G. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.
 - 1. Include precautions against cleaning materials and methods that may be detrimental to finishes and performance.
- H. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Wall Covering Materials: 25 linear feet of each color and pattern of wall covering; store where directed.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Resilient Tackable Wall Covering 09 72 60 - 1
---	--	--

1.05 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain tackable wallcovering system components from a single source.
- B. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing the type of work specified in this section with minimum three years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original factory packaging, labeled with manufacturer, brand name, size, color, and lot number.
- B. Inspect roll materials at arrival on site, to verify acceptability.
- C. Store materials in original, undamaged packaging inside a well-ventilated area protected from weather, moisture, soiling, and extreme temperatures.
- D. Protect packaged adhesive from temperature cycling and cold temperatures.
- E. Do not store roll goods on end.
- F. Maintain room temperature within the storage area at not less than 68 degrees Fahrenheit (20 degrees Celsius) during the period materials are stored

1.07 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.
 - 1. Maintain ambient temperature within the building at not less than 68 degrees Fahrenheit (20 degrees Celsius) for a minimum of seventy-two hours prior to beginning of installation.
 - a. Do not install tackable wallcovering until the space is enclosed and weatherproof.
 - b. Do not install tackable wallcovering until temperature is stabilized and permanent lighting is in place.
- B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.
- C. Provide lighting level of 80 ft candles measured mid-height at substrate surfaces.

1.08 WARRANTY

- A. Submit manufacturer's limited five-year written warranty against manufacturing defects.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Basis of Design Product: Vinyl Tackboard Panel as manufactured by Chatfield Clarke, or approved equal.
- B. Other Acceptable Manufacturers:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Resilient Tackable Wall Covering 09 72 60 - 2
---	--	--

1. Chatfield Clarke; Vinyl Tackboard Panel, Group 2. www.chatfieldclarke.com
2. Koroseal/RJF International; Walltalkers, Tac-Wall: www.koroseal.com.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PRODUCTS

- A. Product Description:
 1. Material: Homogeneous tackable surface material made of primary natural materials consisting of linseed oil, cork, rosin binders and dry pigments mixed and calendared onto a natural jute backing.
- B. Roll Width: 48 inch.
- C. Thickness (Gauge): 1/4 inch.
- D. Roll Length: Approximately \pm 90-95 lineal foot rolls.
- E. Flexibility: Flexible enough to bend around a 2-3/4 inch radius.
- F. Color to extend through thickness of material.
 1. Color: To be selected by Architect from full range.
- G. Mounting: Adhesive.
- H. Performance:
 1. Comply with ASTM F2034.
 2. Surface Burning Characteristics Classification: Provide materials that meet classification ratings below:
 - a. ASTM E84 / NFPA 255: Class II/B
 3. Thermal Conductivity: Coefficient of thermal conductivity is \pm 0.10 W/m-K.
 4. Sound Testing:
 - a. Noise Reduction Coefficient (NRC) ASTM C423: 0.10.
 - b. Sound Absorption Average (SAA) ASTM C423: 0.09.
 5. Resistance to Bacteria: Independent testing has shown that a sterile zone around the material inhibits the growth of organisms such as staphylococcus aureas and Clostridium difficile.
 6. Anti-Static Properties: Naturally anti-static.
 7. Dimensional Stability: Resist cracking, drying, and peeling.
- I.

2.03 ACCESSORIES

- A. Adhesive: Solvent-free, SBR type linoleum adhesive or polyvinyl acetate dispersion type (contact adhesive) when used in a press.
- B. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.
- C. Substrate Primer and Sealer: Alkyd enamel type.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Resilient Tackable Wall Covering 09 72 60 - 3
---	--	--

- D. Color matched caulk:
 - 1. To be selected by Architect from full range.
- E. Joints:
 - 1. Butt joint.
- F. Termination Trim: Extruded plastic, clear.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions in which tackable wallcoverings will be installed.
- B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.
- C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.
- D. Complete finishing operations, including painting, before beginning installation of tackable wallcovering materials.
 - 1. Verify that substrate surfaces are prime painted and ready to receive work, and conform to requirements of the wall covering manufacturer.
 - 2. Wall surfaces to receive wallcovering materials shall be dry and free from dirt, grease, loose paint, and scale.
 - 3. Notify the contractor and architect in writing of any conditions detrimental to the proper and timely completion of the installation.
 - 4. Beginning of installation means acceptance of surface conditions.

3.02 PREPARATION

- A. Surface Preparation: Remove hardware, accessories, plates, and similar items to allow tackable wallcovering to be installed.
- B. Surfaces: Correct defects and clean surfaces that affect work of this section. Remove existing coatings that exhibit loose surface defects.
 - 1. Plaster surface: Remove surface chalk. In new work, use moisture meter to determine moisture content. Do not begin installation when moisture content is greater than five percent.
 - 2. Gypsum board surface: Recess nails and screws. Repair irregular tape joints, sand and remove dust.
 - 3. Painted surface: Remove loose paint or scale. Sand surface of enamel or gloss paint and wipe clean with damp cloth.
 - a. Fill cracks in substrate and smooth irregularities with filler; sand smooth.
 - b. Ensure wall surfaces scheduled to receive tackable wallcovering are properly sealed with a quality primer specified for use under flexible vinyl wallcoverings.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Resilient Tackable Wall Covering 09 72 60 - 4</p>
--	--	---

- c. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.
- C. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.
- D. Vacuum clean surfaces free of loose particles.
- E. Permanent HVAC system should be set to 68 degrees Fahrenheit (20 degrees Celsius) for at least seventy-two hours prior to, during, and after the installation.

3.03 INSTALLATION

- A. Apply adhesive and wall covering in accordance with manufacturer's instructions.
- B. Apply adhesive to wall surface immediately prior to application of wall covering. Let contact adhesive set tack free.
 - 1. Apply adhesive with a 1/16 inch square notch trowel to the area to receiving the sheet (apply enough for one sheet at a time).
- C. Use wall covering in roll number sequence.
- D. Cut sheets to size including a few inches of overage. Allow sheets to lay flat for at least twenty-four hours prior to the application. Mark roll direction and sequence on the backside of each sheet. Hang sheets in sequence as cut from the roll, do not reverse sheets.
 - 1. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.
- E. Back roll each sheet prior to the installation to release curl memory.
- F. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface. Butt edges tightly.
 - 1. Work from top to bottom then side to side. Roll sheet firmly into adhesive for positive contact and to remove air bubbles.
- G. Horizontal seams are not acceptable.
 - 1. For seamed applications, using a seam and strip cutter remove the factory edge of one sheet. Using the same tool, overlap and trace cut the mating edge of the second sheet. Repeat this step for as many sheets as required for the job.
 - 2. Do not seam within 2 inches of internal corners or within 6 inches of external corners.
- H. Scribe, cut, and fit material to butt tightly to adjacent surfaces, built-in casework, and permanent fixtures and pipes.
 - 1. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface.
- I. Cover spaces above and below windows, above doors, in pattern sequence from roll.
- J. Install termination trim.
- K. Remove adhesive residue immediately after each panel is hung with a mild soap/water solution and a soft cloth/sponge.

3.04 CLEANING

- A. Clean wallcovering using a sponge with a neutral pH cleaning solution. Do not use abrasive cleaners. Rinse thoroughly with water and let dry before using.
- B. It is important to remove adhesive while wet.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Resilient Tackable Wall Covering 09 72 60 - 5</p>
--	--	---

3.05 PROTECTION

- A. Protect installed product and finish surfaces from damage during construction.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Resilient Tackable Wall Covering 09 72 60 - 6
---	--	--

SECTION 26 01 00
ELECTRICAL GENERAL PROVISIONS

PART 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.

PART 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."

PART 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 CEC 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).

PART 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.

PART 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 2022 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 2022 California Building Code (CBC), Part 2, Title 24 CCR.
 - 5.1.15 2022 California Fire Code (CFC), Part 9, Title 24, CCR.
 - 5.1.16 2022 NFPA 72 with California State Amendments
 - 5.1.17 National Electrical Testing Association (NETA), 2010 or most current

PART 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.

PART 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.

PART 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.

PART 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.

PART 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.

PART 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.

PART 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.

PART 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.

PART 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.

PART 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.

PART 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.

PART 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.

PART 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.

PART 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.

PART 20 - PATENTS

20.1 Refer to the General Conditions for Contractor's responsibilities regarding patents.

PART 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 are 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.

PART 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.

PART 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.

PART 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.

PART 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.

PART 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 Contractor's 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 Contractor's registered Structural Engineer indicating method of compliance prior to installation.

PART 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.

PART 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.

PART 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.

PART 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.

PART 31 - UTILITY SERVICES

- 31.1 The Division 26 Contractor shall contact the serving utility companies; notify the serving power, telephone and cable TV utilities of the following:
- 31.1.1 Name and address of Contractor.
- 31.1.2 Estimated times of construction start, completion and required service connections.
- 31.1.3 Project service voltage, phase load, and service size.

- 31.1.4 Provide the Architect written verification from each utility company indicating their concurrence with the contract documents.
- 31.2 Contractor shall notify underground service alert 48 hours before start of construction to determine location of existing utilities by calling (800) 422-4133. All work shall be in accordance with the Division 1 Sections of these specifications.
- 31.3 All utility company requirements shall be complied with and approval shall be obtained from the utility company for service equipment. Such as, verification of a field test of the ground fault protection on the main service equipment, panic hardware and etc.

PART 32 - TEST AND INSPECTION PROCEDURES – EXISTING MEDIUM VOLTAGE, AIR INSULATED, CIRCUIT BREAKER TESTS

- 32.1 Tests shall be done in accordance with ANSI/NETA Standards and by a contractor certified in medium voltage testing and procedures. Contractor qualifications shall be submitted to the electrical engineer of record for approval.
- 32.2 Testing shall not be done or scheduled until the outage is scheduled and approved by the owner. Outage shall not exceed 24 hours unless approved by the owner and coordinated with the CM and Architect of Record.
- 32.3 Visual and Mechanical Inspection
 - 32.3.1 Inspect physical and mechanical condition.
 - 32.3.2 Inspect anchorage, alignment, and grounding.
 - 32.3.3 Verify that all maintenance devices are available for servicing and operating the breaker.
 - 32.3.4 Clean the Unit.
 - 32.3.5 Inspect arc chutes.
 - 32.3.6 Inspect moving and stationary contacts for condition, wear, and alignment.
 - 32.3.7 Close/open breaker and check for binding, friction, contact alignment, contact sequence, and penetration.
 - 32.3.8 Perform all mechanical operation tests on the operating mechanism in accordance with manufacturer's published data.
 - 32.3.9 Inspect bolted electrical connections for high resistance using one of the following methods:
 - 32.3.9.1 Use of a low-resistance ohmmeter in accordance with Section 33.4.

32.3.9.2 Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data.

32.3.9.3 Perform a thermographic survey in accordance with NETA standards.

32.3.10 Verify cell fit and element alignment.

32.3.11 Verify racking mechanism operation.

32.3.12 Inspect puffer operation.

32.3.13 Use appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.

32.3.14 Record as-found and as-left operation-counter readings.

32.4 Electrical Tests

32.4.1 Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable. See Section 33.3.

32.4.2 Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with the circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data.

32.4.3 Perform a contact/pole-resistance test.

32.4.4 With the breaker in a test position, perform the following tests:

32.4.4.1 Trip and close breaker with the control switch.

32.4.4.2 Trip breaker by operating each of its protective relays. Recalibrate and adjust relay settings based on time current study to be done for the project.

32.4.4.3 Verify mechanism charge, trip-free, and antipump functions.

32.4.4.4 Verify blowout coil circuit continuity.

32.4.4.5 Verify operation of heaters, if applicable.

32.4.4.6 Test instrument transformers in accordance with NETA standards.

32.5 Test Values

32.5.1 Test Values – Visual and Mechanical

- 32.5.1.1 Bolt-torque levels should be in accordance with manufacturer's published data.
- 32.5.1.2 Results of the thermographic survey shall be in accordance with NETA standards.
- 32.5.1.3 Compare travel and velocity values to manufacturer's published data.

32.5.2 Test Values – Electrical

- 32.5.2.1 Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.
- 32.5.2.2 Circuit breaker insulation resistance should be in accordance with manufacturer's published standards.
- 32.5.2.3 Insulation-resistance values of circuit breakers should be in accordance with manufacturer's published data. Values of insulation resistance less than manufacturer's recommendations should be investigated.
- 32.5.2.4 Microhm or dc millivolt drop values shall not exceed the high levels of the normal range as indicated in the manufacturer's published data. If manufacturer's data is not available, investigate values that deviate from adjacent poles or similar breakers by more than 50 percent of the lowest value.
- 32.5.2.5 Breaker mechanism charge, close, open, trip, trip-free, and antipump features shall function as designed.
- 32.5.2.6 Minimum pickup for trip and close coils shall be in accordance with manufacturer's published data.
- 32.5.2.7 Power-factor or dissipation-factor and capacitance values should be within ten percent of nameplate rating for bushings. Hot collar tests are evaluated on a milliampere/milliwatt loss basis, and the results should be compared to values of similar bushings.
- 32.5.2.8 If no evidence of distress or insulation failure is observed by the end of the total time of voltage application during the over potential test, the circuit breaker is considered to have passed the test.

- 32.5.2.9 The blowout coil circuit should exhibit continuity.
- 32.5.2.10 Heaters should be operational.
- 32.5.2.11 The results of instrument transformer tests shall be in accordance with manufacturer's standards.

PART 33 - PAINTING

- 33.1 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.)

PART 34 - GENERAL DEMOLITION REQUIREMENTS

- 34.1 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.
- 34.2 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.
- 34.3 Perform demolition exercising proper care to prevent injury to the public, workmen and adjoining property.
- 34.4 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.
- 34.5 Rebuild to existing condition or better, existing work which has to be removed to allow the installation of new work as required.
- 34.6 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.
- 34.7 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.
- 34.8 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.
- 34.9 Patch areas requiring patching, including damage caused by removing, relocating or adding fixtures and equipment, damages caused by demolition at adjacent materials.

- 34.10 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.
- 34.11 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.
- 34.12 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.
- 34.13 **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.
- 34.14 **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.
- 34.15 **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.
- 34.16 **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.

PART 35 - PROJECT CLOSEOUT

- 35.1 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.

35.2 Equipment Lists and Maintenance Manuals:

35.2.1 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:

35.2.1.1 Name, model, and manufacturer.

35.2.1.2 Complete parts drawings and lists.

35.2.1.3 Local supply for parts and replacement and telephone number.

35.2.1.4 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.

35.3 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.

PART 36 - RECORD DRAWINGS

36.1 The Division 26 Contractor shall maintain record drawings as specified in accordance with Division 1 of these specifications, and as noted below.

36.2 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.

36.3 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.

PART 37 - CHANGES AND EXTRA WORK

- 37.1 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:
- 37.1.1 The material Costs shall **not exceed** the invoice pricing from an Electrical Distributor indicating the pricing provided at the time of bid. The Contractor shall submit a print out copy of the pricing with the change order to substantiate these values.
 - 37.1.2 The labor Costs shall **not exceed** the latest edition of the "NECA Manual of Labor Units" **normal column**.
- 37.2 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:
- 37.2.1 The Material Costs shall **not be less than 80% of** the invoice pricing from an Electrical Distributor indicating the pricing provided at the time of bid. Restocking fees may also be included in this amount where applicable.
 - 37.2.2 The Labor Costs shall **not be less than 80% of** the latest edition of the "NECA Manual of Labor Units" **normal column**.
- 37.3 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.
- 37.3.1 Couplings.
 - 37.3.2 Set Screw or Compression Fittings, locknuts, Bushings and washers.
 - 37.3.3 Conduit straps and associated screws or nails.
 - 37.3.4 LB fittings or other specialty fittings or specialty mounting hardware may be included where needed.
- 37.4 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.

37.4.1 Locknuts, Bushings, tape, wire markers.

37.5 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.

37.5.1 Associated screws, nails, bolts, anchors or supports.

37.5.2 Locknuts, washers, tape.

37.6 The total labor hours for extra work will be required to be calculated as follows:

37.6.1 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

37.6.2 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

37.6.3 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

37.7 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.

- 37.8 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.
- 37.9 Contractor estimates shall be formatted to clearly identify each of the following:
- 37.9.1 Line item description of each type of material or labor item.
 - 37.9.2 Description of quantity for each item.
 - 37.9.3 Description of (material cost per / quantity).
 - 37.9.4 Description of (labor cost per / quantity).
 - 37.9.5 Description of total labor hour breakdown per Foreman, Journeyman or General Laborer as described above.

PART 38 - ELECTRONIC FILES

- 38.1 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:
- 38.1.1 Clearly indicate each drawing sheet needed (i.e., E1.1, E2.1, etc.).
 - 38.1.2 Identify the name, phone number, mailing address and e-mail address of the person to receive the files.
 - 38.1.3 Provide written confirmation and agreement with the requirements described for payment of computer files, as described below.
- 38.2 Detail or riser diagram sheets, or any other drawings other than floor plans or site plans, **will not be made available to the Contractor.**
- 38.3 Files will only be provided in the AutoCAD format in which they were created.
- 38.4 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.

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 homeruns 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 STABLOY® (AA-8030) as manufactured by Alcan Cable or Listed equal. AA-8000 Series aluminum alloy conductor material shall be recognized by The Aluminum Association

2.2 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

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 Alfex.
- 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 Alfex.
- 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.
- 2.10 Where branch circuit or communication raceways cannot be concealed in ceilings or walls and are required to be exposed in interior spaces, provide nonmetallic surface raceway system sized per the manufacturer capacity requirements. A full complement of nonmetallic fittings must be available and matching device boxes and cover plates must be provided. The color of the raceway system, components and boxes shall be (white). Where data networking cabling is to be installed, all raceway fittings shall meet Category 5 radius requirements. Where specific raceway types have been noted on the drawings they shall be as follows:

2.10.1 System 'SR'	Hubbell Wiremold Panduit Hellerman-Tyton	WALLTRAK 1 series ECLIPSE PN05series LD5 series TSR2 series
2.10.2 System 'SR2'	Hubbell Wiremold Panduit Hellerman-Tyton	WALTRAK 22 2300D Series D2P10 TSR3 series
2.10.3 System 'SR3'	Hubbell Wiremold Panduit Hellerman-Tyton	BASETRAK series 5400 - series 70 series MCR Infostream" series

Provide with offset boxes, inline boxes may only be used where specifically shown on the drawings.

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

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 oversize 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-ra

ting 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

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 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
- 1.6.7 Digital Lighting Management (DLM) local network – Free topology, plug-in wiring system (Cat 5e) for power and data to room devices
- 1.6.8 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
- 1.6.9 Segment Manager – provides web browser-based user interface for system control, scheduling, power monitoring, room device parameter administration and reporting
- 1.6.10 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

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.
- 1.8 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 contractor 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: **WattStopper, Digital Lighting Management (DLM) or Acuity nLight.**

Substitutions: 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:

- 2.1.1 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.
 - 2.1.2 The substitution request must include a statement indicating how the substituted product may impact the completion of the project.
 - 2.1.3 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.
 - 2.1.4 The substitution request must include a detailed analysis indicating any differences between the specified product and the substitution.
 - 2.1.5 Catalog literature for both the specified and the substitution shall be provided along with contact information of the manufacturer for the substituted product.
- 2.2 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

- 2.3 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 OR CEILING MOUNTED OCCUPANCY SENSOR

- 2.4 Wall or ceiling mounted (to suit installation) passive infrared (PIR), ultrasonic or dual technology digital (passive infrared and ultrasonic) occupancy sensor

- 2.5 Digital Occupancy Sensors shall provide graphic LCD display for digital calibration and electronic documentation. Features include the following:
 - 2.5.1 Digital calibration and pushbutton configuration for the following variables:
 - 2.5.1.1 Sensitivity – 0-100% in 10% increments
 - 2.5.1.2 Time delay – 1-30 minutes in 1 minute increments
 - 2.5.1.3 Test mode – Five second time delay
 - 2.5.1.4 Detection technology – PIR, Ultrasonic or Dual Technology activation and/or re-activation.
 - 2.5.1.5 Walk-through mode
 - 2.5.1.6 Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the DLM local network.
 - 2.5.2 Programmable control functionality including:
 - 2.5.2.1 Each sensor may be programmed to control specific loads within a local network.
 - 2.5.2.2 Sensor shall be capable of activating one of 16 user-definable lighting scenes.
 - 2.5.2.3 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
 - 2.5.2.4 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:
 - 2.5.2.4.1 Ultrasonic and Passive Infrared
 - 2.5.2.4.2 Ultrasonic or Passive Infrared
 - 2.5.2.4.3 Ultrasonic only
 - 2.5.2.4.4 Passive Infrared only
 - 2.5.3 Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods.

- 2.5.4 One or two RJ-45 port(s) for connection to DLM local network
- 2.5.5 Two-way infrared (IR) transceiver to allow remote programming through handheld commissioning tool and control by remote personal controls
- 2.5.6 Device Status LEDs, which may be disabled for selected applications, including:
 - 2.5.6.1 PIR detection
 - 2.5.6.2 Ultrasonic detection
 - 2.5.6.3 Configuration mode
 - 2.5.6.4 Load binding
- 2.5.7 Assignment of occupancy sensor to a specific load within the room without wiring or special tools
- 2.5.8 Manual override of controlled loads
- 2.5.9 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
- 2.6 BACnet object information shall be available for the following objects:
 - 2.6.1 Detection state
 - 2.6.2 Occupancy sensor time delay
 - 2.6.3 Occupancy sensor sensitivity, PIR and Ultrasonic
- 2.7 Units shall not have any dip switches or potentiometers for field settings
- 2.8 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.

DIGITAL WALL SWITCHES

- 2.9 Low voltage momentary pushbutton switches in 1, 2, 3, 4, 5 and 8 button configuration. Wall switches shall include the following features:
 - 2.9.1 Two-way infrared (IR) transceiver for use with personal and configuration remote controls.
 - 2.9.2 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.

- 2.9.3 Configuration LED on each switch that blinks to indicate data transmission.
- 2.9.4 Load/Scene Status LED on each switch button with the following characteristics:
 - 2.9.4.1 Bi-level LED
 - 2.9.4.2 Dim locator level indicates power to switch
 - 2.9.4.3 Bright status level indicates that load or scene is active
- 2.9.5 Dimming switches shall include seven bi-level LEDs to indicate load levels using 14 steps
- 2.9.6 Programmable control functionality including
 - 2.9.6.1 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.
 - 2.9.6.2 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
- 2.9.7 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
- 2.10 BACnet object information shall be available for the following objects:
 - 2.10.1 Button state
 - 2.10.2 Switch lock control
 - 2.10.3 Switch lock status
- 2.11 Two RJ-45 ports for connection to DLM local network
- 2.12 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
- 2.13 The following switch attributes may be changed or selected using a wireless configuration tool:
 - 2.13.1 Load and Scene button function may be reconfigured for individual buttons (from Load to Scene, and vice versa)
 - 2.13.2 Individual button function may be configured to Toggle, On only or Off only.

- 2.13.3 Individual scenes may be locked to prevent unauthorized change.
- 2.13.4 Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours
- 2.13.5 Ramp rate may be adjusted for each dimmer switch.
- 2.13.6 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

HANDHELD REMOTE CONTROLS

- 2.14 Battery-operated handheld devices in 1, 2 and 5 button configurations for remote switching or dimming control. Remote controls shall include the following features:
 - 2.14.1 Two-way infrared (IR) transceiver for line of sight communication with DLM local network within up to 30 feet
 - 2.14.2 LED on each button confirms button press
 - 2.14.3 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
 - 2.14.4 Inactivity timeout to save battery life
- 2.15 A wall mount holster and mounting hardware shall be included with each remote control

DIGITAL DAYLIGHTING SENSORS

- 2.16 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
 - 2.16.1 Closed loop sensors measure the ambient light in the space and control a single lighting zone
 - 2.16.2 Open loop sensors measure incoming daylight in the space, and are capable of controlling up to three lighting zones
 - 2.16.3 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
- 2.17 Digital daylighting sensors shall include the following features:

- 2.17.1 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
- 2.17.2 Sensor light level range shall be from 1-6,553 footcandles (fc).
- 2.17.3 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).
- 2.17.4 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.
- 2.17.5 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
- 2.17.6 Photosensors shall have a digital, independently configurable fade rate for both increasing and decreasing light level in units of percent per second.
- 2.17.7 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
- 2.17.8 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
- 2.17.9 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
- 2.17.10 Configuration LED status light on device that blinks to indicate data transmission
- 2.17.11 Status LED indicates test mode, override mode and load binding.
- 2.17.12 Recessed switch on device to turn controlled load(s) ON and OFF.
- 2.17.13 BACnet object information shall be available for the following daylighting sensor objects, based on the specific photocell's settings:
 - 2.17.13.1 Day and night setpoints

- 2.17.13.2 Off time delay
- 2.17.13.3 On and off setpoints
- 2.17.13.4 Up top three setpoints
- 2.17.13.5 Operating mode – on/off, bi-level, tri-level or dimming

2.17.14 One RJ-45 port for connection to DLM local network

- 2.18 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
- 2.19 Any load or group of loadS in the room can be assigned to a daylighting zone
- 2.20 Each load within a daylighting zone can be individually enabled or disabled for discrete control (load independence)
- 2.21 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:

- 2.22 An internal photodiode that measures light in a 100-degree angle, cutting off the unwanted light from bright sources outside of this cone.
- 2.23 Automatic self-calibration, initiated from the photosensor, a wireless configuration tool or a PC with appropriate software
- 2.24 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
- 2.25 WattStopper Product Number: LMLS-400, LMLS-400-L

Open loop digital photosensors shall include the following additional features:

- 2.26 An internal photodiode that measures light in a 60-degree angle cutting off the unwanted light from the interior of the room

- 2.27 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
- 2.28 Each of the three discrete daylight zones can include any non-overlapping group of loads in the room

Dual loop photosensors shall include the following additional features:

- 2.29 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.
- 2.30 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
- 2.31 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
- 2.32 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
- 2.33 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
- 2.34 Device must include extendable mounting arm to properly position sensor within a skylight well

DIGITAL ROOM CONTROLLERS AND PLUG – LOAD CONTROLLERS

- 2.35 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:
 - 2.35.1 Automatic room configuration to the most energy-efficient sequence of operation based upon the devices in the room

- 2.35.2 Simple replacement – Using the default automatic configuration capabilities, a room controller may be replaced with an off-the-shelf
- 2.35.3 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
- 2.35.4 Device Status LEDs to indicate:
 - 2.35.4.1 Data transmission
 - 2.35.4.2 Device has power
 - 2.35.4.3 Status for each load
 - 2.35.4.4 Configuration status
- 2.35.5 Quick installation features including:
 - 2.35.5.1 Standard junction box mounting
 - 2.35.5.2 Quick low voltage connections using standard RJ-45 patch cable
- 2.35.6 Based on individual configuration, each load shall be capable of the following behavior on power up following the loss of normal power
 - 2.35.6.1 Turn on to 100%
 - 2.35.6.2 Remain off
 - 2.35.6.3 Turn on to last level
- 2.35.7 Each load shall be configurable to operate in the following sequences based on occupancy:
 - 2.35.7.1 Auto-on/Auto-off (Follow on and off)
 - 2.35.7.2 Manual-on/Auto-off (Follow off only)
- 2.35.8 The priority of each load output shall be reversible, via digital configuration, so that on is off and off is on
- 2.35.9 BACnet object information shall be available for the following objects:
 - 2.35.9.1 Load status
 - 2.35.9.2 Electrical current

- 2.35.9.3 Total watts per controller
- 2.35.9.4 Schedule state – normal or after-hours
- 2.35.9.5 Demand response control and cap level
- 2.35.9.6 Room occupancy status
- 2.35.9.7 Total room lighting and plug loads watts
- 2.35.9.8 Total room watts/sq ft
- 2.35.9.9 Force on/off all loads
- 2.35.10 UL 2043 plenum rated
- 2.35.11 Manual override and LED indication for each load
- 2.35.12 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.
- 2.35.13 Zero cross circuitry each load
- 2.35.14 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.
- 2.36 On/Off Controllers shall include:
 - 2.36.1 One or two relay configuration
 - 2.36.2 Efficient 150 mA switching power supply
 - 2.36.3 Three RJ-45 DLM local network ports with integral strain relief and dust cover
 - 2.36.4 WattStopper product numbers: LMRC-101, LMRC-102
- 2.37 On/Off/Dimming enhanced Room Controllers shall include:
 - 2.37.1 Real time current monitoring
 - 2.37.2 Multiple relay configurations
 - 2.37.2.1 One, two or three relays (LMRC-21 x series)

- 2.37.2.2 One or two relays (LMRC-22x series)
- 2.37.3 Efficient 250 mA switching power supply
- 2.37.4 Four RJ-45 DLM local network ports with integral strain relief and dust cover
- 2.37.5 Once dimming output per relay
 - 2.37.5.1 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)
 - 2.37.5.2 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)
 - 2.37.5.3 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
 - 2.37.5.4 The LED level indicators on bound dimming switches shall utilize this new maximum and minimum trim
 - 2.37.5.5 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
 - 2.37.5.6 Calibration and trim levels must be set per output channel
 - 2.37.5.7 Devices that set calibration or trim levels per controller are not acceptable
 - 2.37.5.8 All configuration shall be digital. Devices that set calibration or trim levels per output channel via trim pots or dip-switches are not acceptable
- 2.37.6 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

- 2.37.7 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
- 2.37.8 The following dimming attributes may be changed or selected using a wireless configuration tool:
 - 2.37.8.1 Establish preset level for each load from 0-100%
 - 2.37.8.2 Set high and low trim for each load
 - 2.37.8.3 Set lamp burn in time for each load up to 100 hours
- 2.37.9 Override button for each load provides the following functions:
 - 2.37.9.1 Press and release for on/off control
 - 2.37.9.2 Press and hold for dimming control

DLM LOCAL NETWORK (Room Network)

- 2.38 The DLM local network is a free topology lighting control physical connection and communication protocol designed to control a small area of a building
- 2.39 Features of the DLM local network include:
 - 2.39.1 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
 - 2.39.2 Simple replacement of any device in the network with a standard off the shelf unit without requiring commissioning, configuration or setup
 - 2.39.3 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
 - 2.39.4 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
- 2.40 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

- 2.41 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
- 2.42 WattStopper Product Number: LMRJ-Series

CONFIGURATION TOOLS

- 2.43 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
- 2.44 Features and functionality of the wireless configuration tool shall include but not be limited to:
 - 2.44.1 Two-way infrared (IR) communication with DLM IR-enabled devices within a range of approximately 30 feet
 - 2.44.2 High visibility organic LED (OLED) display, pushbutton user interface and menu-driven operation
 - 2.44.3 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
 - 2.44.4 Save up to eight occupancy sensor setting profiles, and apply profiles to selected sensors
 - 2.44.5 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
 - 2.44.6 Adjust or fine-tune daylighting settings established during auto-configuration, and input light level data to complete configuration of open loop daylighting controls
 - 2.44.7 Set room mode for testing of Normal Hours (NH) and After Hours (AH) parameter settings
 - 2.44.8 Verify status of building level network devices

PROGRAMMING, CONFIGURATION AND DOCUMENTATION SOFTWARE

- 2.45 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:

- 2.45.1 Occupancy sensor detection LED disable for performance and other aesthetic spaces where blinking LEDs present a distraction.
 - 2.45.2 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.
 - 2.45.3 Separate fade time adjustments per load for both normal and after hours from 0 - 4 hours.
 - 2.45.4 Configurable occupancy sensor re-trigger grace period from 0 - 4 minutes separate for both normal hours and after hours.
 - 2.45.5 Separate normal hours and after hours per-load button mode with modes including: Do nothing, on only, off only, on and off.
 - 2.45.6 Load control polarity reversal so that on events turn loads off and vice versa.
 - 2.45.7 Per-load DR (demand response) shed level in units of percent.
 - 2.45.8 Load output pulse mode in increments of 1second.
 - 2.45.9 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
- 2.46 Generation of reports at the whole file, partial file, or room level. Reports include but are not limited to:
- 2.46.1 Device list report: All devices in a project listed by type.
 - 2.46.2 Load binding report: All load controller bindings showing interaction with sensors, switches, and daylighting.
 - 2.46.3 BACnet points report: Per room Device ID report of the valid BACnet points for a given site's BOM.
 - 2.46.4 Room summary report: Device manifest for each room, aggregated by common BOM, showing basic sequence of operations.
 - 2.46.5 Device parameter report: Per-room lists of all configured parameters accessible via hand held IR programmer for use with O&M documentation.

- 2.46.6 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).
- 2.46.7 Occupancy sensor report: Basic settings including time delay and sensitivity(ies) for all occupancy sensors
- 2.47 Network-wide programming of parameter data in a spreadsheet-like programming environment including but not limited to the following operations
 - 2.47.1 Set, copy/paste an entire project site of sensor time delays.
 - 2.47.2 Set, copy/paste an entire project site of sensor sensitivity settings.
 - 2.47.3 Search based on room name and text labels.
 - 2.47.4 Filter by product type (i.e. LMRC-212) to allow parameter set by product.
 - 2.47.5 Filter by parameter value to search for product with specific configurations
- 2.48 Network-wide firmware upgrading remotely via the BACnet/IP network
 - 2.48.1 Mass firmware update of entire rooms
 - 2.48.2 Mass firmware update of specifically selected rooms or areas
 - 2.48.3 Mass firmware upgrade of specific products

USER INTERFACE

- 2.49 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:
 - 2.49.1 Set network parameters including panel device ID, MS/TP MAC address, baud rate and max master range.
 - 2.49.2 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.
 - 2.49.3 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.

- 2.49.4 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.
- 2.49.5 Button binding of digital switches to groups shall be accessible via the handheld IR remote and accomplished from the digital switch station.
- 2.49.6 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.
- 2.49.7 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.

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.

ACCEPTANCE TESTING SUPPORT SERVICES

- 3.13 On all California projects, a certified lighting controls acceptance test technician (CLCATT) must verify the installation of the lighting control system. Manufacturer should include an extra day of factory technician's time to assist the CLCATT review the functionality and settings of the lighting control hardware per the requirements in the California State forms. It will be the CLCATT'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 CLCATT with this task

END OF SECTION

SECTION 26 24 16
PANELBOARDS

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 Multi-pole breakers shall have one common trip handle or be internally connected. Handle ties are not acceptable.
- 2.8 Circuit breakers for a multi-wire branch circuit shall be tied together with a factory breaker handle tie.
- 2.9 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.
- 2.10 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.
- 2.11 Acceptable manufacturers are Square D, Eaton, Siemens or General Electric.
- 2.12 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)

- 2.13 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.

2.14 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.

2.15 The SPD panelboard shall be top or bottom feed according to requirements. A circuit directory shall be located inside the door.

2.16 SPD shall meet or exceed the following criteria:

2.16.1 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.

2.16.2 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

2.16.3 SPD shall be UL labeled with 100kA Short Circuit Current Rating (SCCR).

2.17 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

2.18 SPD shall be UL labeled with a minimum 100kVA short circuit rated (SCCR).

2.19 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

2.20 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.

2.21 Suppression components shall be heavy duty 'large block' MOVs, each exceeding 30mm diameter.

- 2.22 Type 4 SPD shall include a serviceable, replaceable module.
- 2.23 SPD shall be equipped with the following diagnostics:
 - 2.23.1 Visual LED diagnostics including a minimum of one green LED indicator per phase, and one red service LED.
 - 2.23.2 No other test equipment shall be required for SPD monitoring or testing before or after installation.
- 2.24 SPD shall have a response time no greater than 1/2 nanosecond
- 2.25 SPD shall have a 10 year warranty
- 2.26 The SPD panelboard shall have removable interior
- 2.27 The SPD panelboard main bus shall be aluminum and rated for the load current required
- 2.28 The SPD panelboard shall include a 200% rated neutral assembly with copper neutral bus
- 2.29 The unit shall be provided with a safety ground bus

(SPD) Quality Assurance

- 2.30 Manufacturer Qualifications: Engage a firm with at least 5 years experience in manufacturing transient voltage surge suppressors.
- 2.31 Manufacturer shall be ISO 9001 or 9002 certified.
- 2.32 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.
- 2.33 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.

Short Circuit & Coordination Study

- 3.4 The contractor shall provide the following studies; a time current and complete short-circuit study, equipment-interrupting or withstand evaluation, and a protective-device coordination study as described below for the distribution system. The equipment study shall be included with the equipment submittals. The studies shall include all portions of the electrical distribution system from the normal and alternate sources of power throughout the low-voltage distribution system. Normal system operating method, alternate operation, and operations which could result in maximum-fault conditions shall be thoroughly covered in the study. The studies are to be reviewed by a Professional Engineer registered in the State of California.
- 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 Short-Circuit Study
- 3.5.1 The study shall be in accordance with applicable ANSI and IEEE standards.
- 3.5.2 The study input data shall include the short-circuit single- and three-phase contributions from all sources, with the X/R ratio, the resistance and reactance components of each branch impedance, motor and generator contributions, base quantities selected, and all other applicable circuit parameters.
- 3.5.3 Short-circuit momentary duties and interrupting duties shall be calculated on the basis of maximum available fault current at each switchgear bus, switchboard, motor control center, distribution panelboard, pertinent branch circuit panelboards, and other significant locations through the system.
- 3.5.4 For the portions of a system utilizing medium- and high-voltage breakers, separate calculations shall be made for one-half cycle (close and latch) currents and interrupting currents. Calculations shall be for three-phase and phase-to-ground faults at each bus under consideration.
- 3.5.5 For the portions of a system utilizing low-voltage breakers (less than 1,000 volts), calculations shall be made for three-phase and phase-to-ground interrupting currents at each bus under consideration.
- 3.6 Equipment Evaluation Study
- 3.6.1 An equipment evaluation study shall be performed to assure the adequacy of circuit breakers, controllers, surge arresters, busways, switches, and fuses by tabulating and comparing the short-circuit ratings of these devices with the maximum short-circuit momentary and interrupting duties. Series rating of over current protective devices shall be permitted to reduce the maximum available short circuit current to panelboard branch circuit breakers to no more than

10,000 amps symmetrical for the 120/208 volt system and 14,000 amps symmetrical for the 277/480 volt system.

3.7 Protective-Device Coordination Study

- 3.7.1 A protective-device coordination study shall be performed to select or to verify the selection of power fuse ratings, protective-relay characteristics and settings, ratios, and characteristics of associated voltage and current transformers, and low-voltage breaker trip characteristics and settings. Time current curves are to be colored to clearly indicate coordination.
- 3.7.2 The coordination study shall include all voltage classes of equipment from the source's incoming line protective device down to and including each motor control center and/or panelboard. The phase and ground over current protection shall be included as well as settings for all other adjustable protective devices. Ground fault settings are to, as a minimum coordinate with a downstream 50 amp branch circuit breaker.
- 3.7.3 Protective device selection and settings shall be in accordance with requirements of the National Electrical Code and the recommendations of the ANSI/IEEE Standard 399, as applicable.

3.8 Study Report

- 3.8.1 The results of the power-system studies shall be summarized in a final report. The report shall include the following sections:
 - 3.8.1.1 Description, purpose, basis, and scope of the study and a single-line diagram of the portion of the power system which is included within the scope of study.
 - 3.8.1.2 Tabulations of circuit breaker, fuse, and other equipment ratings versus calculated short-circuit duties and commentary regarding same.
 - 3.8.1.3 Protective device coordination curves, with commentary.
 - 3.8.1.4 The selection and settings of the protective devices shall be provided separately in a tabulated form listing circuit identification, IEEE device number, current transformer ratios, manufacturer, type, range of adjustment, and recommended settings. A tabulation of the recommended power fuse selection shall be provided for all fuses in the system.
 - 3.8.1.5 Fault-current tabulations including a definition of terms and a guide for interpretation.

3.8.1.6 The report must be submitted with the material submittal for the engineer's approval.

3.9 Implementation

3.9.1 The equipment manufacturer is to be responsible for providing over current devices which are in compliance with the results of the above study.

3.10 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.

3.11 The incident level calculations for each piece of equipment shall be given to the owner and maintained on file by the maintenance department.

3.12 The design goal is to minimize the incident energy to which a maintenance employee may be exposed.

END OF SECTION

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	HBL1221	L1221-2L	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 oriented with ground side up. 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" cover plates.
- 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 All receptacles and line voltage switches shall be labeled on faceplate utilizing white Dymo-Tape with black lettering. Labeling format shall be 'XX-YY'. XX represents panel name and YY represents circuit number. Labels shall be placed below the top faceplate fastener and above the top edge of faceplate opening. In no circumstance shall they overlap the fastener or the receptacle.

- 3.2 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.
- 3.3 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.
- 3.4 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

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 CEC 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

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

SECTION 27 01 00
COMMUNICATIONS GENERAL PROVISIONS

PART 1 - SUMMARY

- 1.1 This Division of the specifications outlines the provisions of the contract work to be performed as a subcontract 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

SECTION 27 10 00
VOICE / DATA 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 19 – Conductors
 - 1.2.3 Section 26 05 33 – Conduit and Fittings
 - 1.2.4 Section 26 05 34 – Outlet and Junction Boxes
- 1.3 Approved minimum Product and Contractor Extended Warranty Certifications;
 - 1.3.1 All components shall be manufactured by the approved manufacturer, the installing Contractor must have the accompanying certification from the product manufacturer for installation of an “Extended Warranted System” as required by each manufacturer and as indicated in these specifications.
 - 1.3.1.1 Specified system warranties are to be established between the component and cable manufacturers and the District, warranties between the cable manufacturer only or installing Contractor and the District are not considered equal.
 - 1.3.1.2 Warranty: Warranty shall be a full “Performance Warranty” installed by a “Certified Contractor” as specified by the approved manufacturer. The Contractor must provide documentation from manufacturer indicating their qualifications for installation of the system, in compliance with the manufacturer’s warranty program at the proper level of coverage. A “Component Warranty” will not be considered equal.
- 1.4 Acceptable manufacturers are:
 - 1.4.1 **Commscope**
 - 1.4.1.1 Installing contractor must be Commscope certified to install this system
 - 1.4.1.2 Installing Contractor must be PartnerPro certified to install any of the systems under the Commscope Family of brand names
 - 1.4.1.3 The Infrastructure System shall be provided with a 25-Year Warranty.
 - 1.4.2 **Warranty: Warranty shall be a full “Performance Warranty” installed by a “Certified Contractor” as specified by the approved manufacturer. A**

“Component Warranty” will not be considered equal. All components, labor, and 'Link Performance Criteria" shall be warranted by the approved manufacturer. Warranty shall be to the District for 25-years after District acceptance and sign-off of the completed system. The contractor must provide documentation from the approved manufacturer as indicated in Section 1.3 indicating their qualifications for installation of this system in compliance with the manufacturer’s warranty requirements as a Certified Contractor.

1.4.3 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 wiring system including warranties, as shown in the EIA/TIA Category-6 and the Augmented Category-6 (6A) guidelines.

1.4.4 All components, parts, infrastructure, patch cables, termination panels and cables must be classified by the manufacturer or manufacturers as a part of the “Extended Warranty” program. Contractor may not mix in components from other certified programs or materials that are not considered part of the “Lifetime” warranty.

1.4.5 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.

1.5 **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. **Subcontractors with Electrical Contractors or other warranted or non-warranted Contractors for supervised installation of any part of this system are not approved.**

1.5.1 Contractor shall have on staff a minimum of (1) BICSI RCDD as full-time employees.

1.5.2 The successful Contractor shall be a California licensed C7 or C10 Premise Wiring Contractor as defined in this specification.

1.5.3 All work shall be performed under the supervision of a company accredited and trained by the Manufacturer of the components and cable and such accreditation must be presented with the bid submittal. All personnel performing work on this project must have successfully completed the manufacturer’s training courses to completely comply with the extended warranty requirements prior to performance of any work on this project. Accreditation will consist of individual employee certifications issued by the manufacturer or manufacturers.

- 1.5.4 All personnel engaged in the testing of premises fiber optic and copper UTP cable systems must have successfully completed the test equipment manufacturer's training courses. Certification of such training must be presented with the bid submittal. Cut sheets of the test equipment to be utilized shall be provided with Phase I project material submittals.
- 1.5.5 **This project shall employ Category-6 and Augmented Category-6 cabling. The Contractor shall install the related components in relation to the performance requirements for the type of cable installed.**
- 1.5.6 If Contractor routes cable and/or associated pathways in another route than indicated on the drawings, they shall maintain all maximum cable installation distances as required by the manufacturer's distance limitations.
- 1.6 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.
- 1.7 The drawings indicate a schematic routing of cables 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 wall assembly.
- 1.8 Unless otherwise noted in the project drawings or these specifications, the Division 26 Contractor shall provide the installation of all conduits, outlet and junction boxes, trenching and pull box installation.
- 1.9 General Submittal Requirements
- 1.9.1 **Group #1 Submittal** shall be made in electronic format within (20) working days after the award of the contract by the District. This submittal shall include the following:
- 1.9.1.1 Complete Bill of Materials in Excel Spreadsheet format with bills of quantities, including all materials, components, devices, and equipment required for the 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 - Description and quantity of each product, Manufacturer's Name and Model Number, Manufacturer's Specification Sheet or Cut Sheet and Specification Item Number referenced for each required product or if not shown in the specifications, Drawing Detail Number being referenced. (ie; Spec. 27 20 00 Item 2.1.3 and/or Detail #1/E4.15).
- 1.9.1.2 Material Cut Sheets shall provide detailed product information and shall be original manufacturer product bulletins.

- 1.9.1.3 Copies of material information from vendor websites shall not be considered equal and will not be accepted. Copies of Web pages which include multiple pages of irrelevant information not associated with the product cut sheet shall not be considered equal and will not be accepted.
- 1.9.1.4 Material Cut Sheet part number provided shall be highlighted or provided with an arrow directed at the corresponding part number.
- 1.9.1.5 Equipment items which have individual components will require that all component parts be listed individually.
- 1.9.1.6 Description of any specialty backbox requirements
- 1.9.1.7 All wiring types required for installation of this system
- 1.9.1.8 Spare parts shall be listed individually to verify proposed quantity
- 1.9.1.9 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.

1.9.2 **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. Each submission shall include 'D' or 'E' size print copies to match the contract drawings, and (1) USB Flash Drive copy with files in a AutoCAD format. Building floor plan CAD files will be made available. 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 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:

- 1.9.2.1 MDF and IDF equipment rack or cabinet elevations will be required to be provided including cable routing, grounding, support, UPS, network electronics, etc. and position of all components in the rack or cabinet.
- 1.9.2.2 Provide labeling plan which identifies the proposed scheme for identifying all components including racks, patch panels (fiber and copper), site distribution feed cables, horizontal station cables and site conduit systems (handholes, pullboxes, etc.).
- 1.9.2.3 Provide shop drawings showing all end device locations, tap values, paging zones and amplifier sizing for each zone for analog speakers and horns, including devices connected to IP-Based zone controllers.

- 1.9.3 Common submittal mistakes which will result in submittals being rejected:
 - 1.9.3.1 Not including the qualifications of the installing Contractor Company and Contractor’s Staff.
 - 1.9.3.2 Not including all items listed in the above itemized description.
 - 1.9.3.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlights, underlining or clouding the items to be reviewed (provided for the project) or crossing out the items which are not applicable.
 - 1.9.3.4 Not including actual manufacturer’s cut sheets or catalog information of proposed products.
 - 1.9.3.5 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.
- 1.9.4 The Contractor shall make a written request directly to Johnson Consulting Engineers for electronic drawing files (CAD). As a part of the written request, please include the following information:
 - 1.9.4.1 Clearly indicate Project Name and Client, Johnson Consulting Job Number (located in the bottom left corner of JCE Engineering Stamp) and each drawing Sheet Number required (i.e. E1.1, E2.1, E4.1 etc.)
 - 1.9.4.2 Identify the Name, Company, Title, phone number, mailing address and e-mail address of the person to receive the files.
 - 1.9.4.3 Detail or Riser diagram sheet, System Schematic drawings or any other drawings other than floor plans or site plans, will not be made available to the Contractor.
 - 1.9.4.4 Files will only be provided in the AutoCAD format in which they were created (i.e. version 2015 or version 2016). Files will not be made available in REVIT format.
 - 1.9.4.5 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 and delays in requesting files will not alleviate the Contractor from submitting required documents within the required timeline.

PART 2 – PRODUCTS

- 2.1 Equipment racks have been detailed on the drawings and additional component information requirements have been described in the following sections and on the drawings. The following is a list of approved manufacturers for each type of rack to be furnished.
- 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)** shall be manufactured by Chatsworth Products Inc. (CPI). CPI Model #50120-703 Quadrarack 4-Post equipment rack, 84" High by 20.3" Wide by 29" Deep, black color. See MDF and IDF Room sketches for quantity of racks required. Alternate rack option as manufactured by Hubbel Model #SF841929T NEXTFRAME 4-Post equipment rack.
- 2.2 **Vertical Slim Wall Mounted IDF Cabinet - IDF Cabinet Requirements;**
- 2.2.1 Provide wall mount cabinet with vertical mounting rails for the lower equipment. Provide Hubbell ReBox Model #RE4X, with 2RU upper rack rail capacity and 5RU lower rack rail capacity. Refer to floor plans and detail drawings for additional requirements.
- 2.2.2 Provide optional 5RU Bracket Model #REKZ.
- 2.2.3 Bond to electrical box in cabinet. Follow manufacturer's instructions.
- 2.2.4 All fiber optic feed cables routed to the IDF Cabinet shall be provided with 20-feet of slack for a service loop, mounted in the accessible ceiling above the IDF cabinet. Provide a 12" diameter service loop manager for fiber by Leviton #48900-IFR. Maximum of (3) fiber feed cables per manager
- 2.2.5 Provide (1) ground bus bar kit per IDF Room. Ground Bus Bar Kit as manufactured by CPI #13622-010 or approved equal. Ground Bus Bar and all bonding conductors to the bus bar shall be labeled. Grounding conductors shall be routed to the equipment racks, cable runway and electrical panel. Ground Bus Bar shall be mounted below the IDF Cabinet as shown in the drawing details.

MDF Room Requirements

- 2.3 The main Distribution Frame (MDF) Room is existing
- 2.3.1 Provide backboard 8'-0" high x $\frac{3}{4}$ " thick, with a minimum 48" width. Refer to the floorplans for the actual layout of the backboard coverage. Plywood mounting backboard shall be flame resistant, painted with fire resistant paint "white" or color to match the room finish. Contractor shall provide minimum one side finish grade plywood. Backboard shall be mounted with finish side out, regardless of location of fire rating stamp. Show proof of fire rating stamp or IOR on Inspector prior to installation.

- 2.4 Provide Fiber Optic Feed Cable Patch Panels – Fiber optic termination equipment (rack mounted), including all associated installation hardware. The equipment must have a sufficient number of ports to connect all fibers in every cable terminated at this location. Provide 25% spare capacity for future wiring requirements. Provide blank fillers for all used portions of the panel. All fiber feed cables shall be terminated in a single fiber optic patch panel.
 - 2.4.1 MDF location shall be furnished with a minimum 24-Port patch panel, fully loaded with bulkheads. Type of connectors in the bulkheads shall be determined by the type of connectors used for termination of the fiber feed cables.
 - 2.4.2 Contractor shall provide a minimum of 6-feet of slack on the fiber feed cable in the fiber optic patch panel. The first 48” of a tight buffered cable or the first 24” of a loose tube cable shall not be stripped back in the patch panel. Each type of cable shall have a minimum of 24” of stripped slack within the patch panel. Total slack within the patch panel shall not be less than 6-feet in length.
 - 2.4.3 All fiber cables shall be secured to the patch panel with the Kevlar strength members at the manufacturer provided anchor point at the rear of the panel.
 - 2.4.4 Provide all other items as detailed on the drawings.

IDF Location Requirements

- 2.5 The Intermediate Distribution Frame (IDF) Room shall be a secondary wiring and equipment location for the data networking system. The Contractor shall include the following items at this location:
 - 2.5.1 Provide backboard 8’-0” high x ¾” thick, with a minimum 48” width. Refer to the floorplans for the actual layout of the backboard coverage. Plywood mounting backboard shall be flame resistant, painted with fire resistant paint “white” or color to match the room finish. Contractor shall provide minimum one side finish grade plywood. Backboard shall be mounted with finish side out, regardless of location of fire rating stamp. Show proof of fire rating stamp to IOR on Inspector prior to installation.
- 2.6 Provide Fiber Optic Feed Cable Patch Panels – Fiber optic termination equipment (rack mounted), including all associated installation hardware. The equipment must have a sufficient number of ports to connect all fibers in every cable terminated at this location. Provide 25% spare capacity for future wiring requirements. Provide blank fillers for all used portions of the panel. All fiber feed cables shall be terminated in a single fiber optic patch panel.
 - 2.6.1 Each IDF location shall be furnished with a minimum 24-Port patch panel, fully loaded with bulkheads. Type of connectors in the bulkheads shall be determined by the type of connectors used for termination of the fiber feed cables.

- 2.6.2 Contractor shall provide a minimum of 6-feet of slack on the fiber feed cable in the fiber optic patch panel. The first 48” of a tight buffered cable or the first 24” of a loose tube cable shall not be stripped back in the patch panel. Each type of cable shall have a minimum of 24” of stripped slack within the patch panel. Total slack within the patch panel shall not be less than 6-feet in length.
- 2.6.3 All fiber cables shall be secured to the patch panel with the Kevlar strength members at the manufacturer provided anchor point at the rear of the panel.
- 2.6.4 Provide all other items as detailed on the drawings.
- 2.7 Provide Category-6 Modular Patch Panels (rack mounted) with RJ45 style connectors for terminating all twisted pair cables from each Voice/Data/IP-Page outlet, Audio-Visual, Security Camera or other Category-6 devices served from this IDF location. Provide 25% RJ45 Inserts spare capacity for future wiring requirements. Confirm color requirements with District IT Department. All patch panels shall be 24 or 48-ports maximum. Provide cable support bars at the rear of each patch panel. All cable shall be secured to bars with Velcro straps.
- 2.8 Provide Category-6A Modular Patch Panels (rack mounted) with RJ45 style connectors for terminating all twisted pair cables from each WAP location served from this IDF Location. Provide 25% RJ45 Inserts spare capacity for future wiring requirements. All patch panels shall be 24 or 48-ports maximum. Provide cable support bars at the rear of each patch panel. All cable shall be secured to bars with Velcro straps.
 - 2.8.1 Patch panels shall be furnished Laser/Ink Jet Printer adhesive labeling to identify additional information required by the District labeling standards. Each panel shall be provided with Panduit Label Kit Part #C252X030FJJ (or approved equal).
 - 2.8.2 Patch Panels to be provided with color coded Category-6, RJ-45, modular inserts. The 25% spare capacity for future at each IDF or MDF location shall be filled out with Voice/Data color modular inserts. Inserts shall be provided in the following colors per the District Standards;
 - 2.8.2.1 Voice/Data – Blue
 - 2.8.2.2 Wireless Access Points – Green
 - 2.8.2.3 Audio-Visual Data Ports – Yellow
 - 2.8.2.4 Security and Video Surveillance – Orange

IDF UPS Requirements

- 2.9 The Contractor shall coordinate with the Division 26 Contractor to properly locate the power outlet connection for the UPS in the IDF Cabinet. The location shown on the floor plans is diagrammatical and does not give the Division 26 Contractor an exact placement. Refer to the drawing details for location of power outlet inside Cabinet.

- 2.10 Vertical Slim Wall Mounted IDF Cabinet shall be furnished and installed with a UPS by the Contractor.
- 2.10.1 IDF Room UPS; Uninterruptible power supply with mounting brackets and all cables. UPS shall be provided with backplane configuration containing:
- 2.10.1.1 Minimum of (6) 15-amp, 120-volt, non-locking, NEMA 5-15R, output receptacles.
 - 2.10.1.2 Input of (1) 15-amp, 120-volt, non-locking, NEMA 5-15P plug installed on 10'-0" power cord.
 - 2.10.1.3 TrippLite SmartPro 120V 750VA 600W Line-Interactive Sine Wave UPS, 1U Rack/Vertical, Model #Smart750RM1U (No Approved Equal)
 - 2.10.1.4 Provide each UPS with the optional Network interface card – Model #SNMPWEBCARD in UPS. Power Management Software to be included with all UPS models.
 - 2.10.1.5 All UPS products shall be furnished with a 3-Year warranty.
 - 2.10.1.6 UPS shall be vertically mounted in the Slim Wall Mount IDF Cabinet. Confirm with District IT Department for arrangement of components inside IDF Cabinet prior to installation.

Fiber Optic Patch Cords

- 2.11 Fiber optic patch cords shall be furnished and installed by the Contractor.
- 2.12 All fiber optic patch cords furnished by the Contractor shall match the grade and glass of the fiber optic feed cable installed for the network infrastructure cabling system. The Contractor shall confirm with the District IT Department the type of connector required at the network equipment prior to ordering or installing the patch cords.
- 2.13 Multimode Fiber Optic Patch Cords – Patch cords shall be duplex 50/125um, laser-optimized, OM4 grade multimode optical glass. Fiber optic patch cords shall be furnished with LC connectors at both ends. Fiber patch cords shall be furnished with ceramic ferrules. All Multimode patch cords shall be Aqua (Lt. Blue) in color. Patch cords shall be 3-feet (1 meter) in length. Provide (2) Fiber Cable Assemblies for each end (IDF/MDF) of the fiber cable run for a total of (4) Fiber Cable Assemblies per fiber feed cable run.
- 2.14 Contractor shall be responsible for confirming the network switch connections with the District IT Director prior to ordering or installing the patch cords.

Copper Patch Cords

- 2.15 Copper patch cords shall be furnished and installed by the Contractor.

- 2.16 Category-6 patch cables installed at the IDF location (patch panel end) shall match the color of the outlet inserts on the patch panel and faceplate. The patch cables will be provided as 50% of all patch cables 1-foot in length and 50% of all patch cables 3-foot in length for standard installations. Approved patch cables shall be as manufactured by Commscope:
- 2.16.1 Patch cords shall be in compliance with the Commscope “Channel” warranty program.
- 2.17 Category-6 patch cables installed at the workstation (outlet) location shall match the color of the outlet inserts on the faceplate. Approved patch cables shall be as manufactured by Commscope:
- 2.17.1 Provide 100% of the total Category-6 cable ports provided on the patch panels.
- 2.17.2 All patch cords to be installed by Contractor. Provide 100% of total copper patch cords required to be (10) feet in length, unless otherwise noted.
- 2.17.3 Patch cords installed at Wall Mounted Telephone and Network Camera locations shall be (2) feet in length.
- 2.18 **Augmented Category-6** patch cables installed at the IDF location (patch panel end) shall match the color of the outlet inserts on the patch panel and faceplate. The patch cables will be provided as 50% of all patch cables 1-foot in length and 50% of all patch cables 3-foot in length for standard installations. Approved patch cables shall be as manufactured by Commscope:
- 2.18.1 Patch cords shall be in compliance with the Commscope “Channel” warranty program.
- 2.19 **Augmented Category-6** patch cables installed at the workstation (outlet) location shall match the color of the outlet inserts on the faceplate. Approved patch cables shall be as manufactured by Commscope:
- 2.19.1 Patch cords installed at WAP (Wireless Access Point) locations shall be (3) feet in length
- 2.19.2 Patch cords installed at IP-Based Network Camera locations shall be (1.5) feet
- 2.20 Requirements for all copper patch cords furnished:
- 2.20.1 Color of patch cords shall be determined by the color code shown in detail drawings and specifications.
- 2.20.2 Patch cords shall as manufactured by Leviton, Panduit, Ortronics, Siemon or any other manufacturer not listed are not approved through the “Channel” warranty.

2.20.3 Patch cords furnished must be in compliance with the manufacturer's "Channel" warranty requirements. Patch cords not warranted through the selected manufacturer Channel warranty program will not be approved for use with the network infrastructure.

2.20.4 Provide all other items as detailed on the drawings.

Campus Indoor/Outdoor Fiber Optic Feed Cable

2.21 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.

2.22 Outdoor Fiber Feed Cable Applications – Fiber optic cable shall be rated for indoor/outdoor riser rated 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 .370". Central tube or loose tube type fiber will not be considered equal.

2.23 Fiber optic feed cables shall be partially installed in the existing pathways and in new pathways unless otherwise shown on the drawings. Contractor shall not interrupt service to the users without a planned outage approved by the District. The Contractor may use the existing feed cable to demoed buildings as a pull wire or other cables identified to be removed from the existing conduits, provided that the service is back on-line prior to the user's normal working hours.

2.24 New Fiber Optic Feed Cables – Refer to the site plans, floor plans and drawing details for locations of new fiber optic feed cable runs. Fiber optic feed cables for the data infrastructure must be installed as follows:

2.24.1 Feed cables shall be clearly defined and labeled for each system. Provide color coding designations with a different color marker for the multimode and/or single mode fiber feed terminations in the fiber patch panels.

2.24.2 Cable shall contain one or all types of fibers listed below:

2.24.3 Provide Multimode 50/125-micron fiber optic glass, (minimum OM4+ laser-optimized grade, extended distance) for dual mode operation at 850 nm and 1300 nm wave lengths.

2.24.4 Maximum attenuation at 3.0dB/km @ 850nm and 1.0dB/km @ 1310nm. Minimum 1-gigabit Ethernet distance guarantee of 1110 meters @ 850nm and 600 meters @ 1300nm. Minimum 10-gigabit Ethernet distance guarantee of 550 meters @ 850nm/1300nm. Fiber shall be ISO-TIA OM4 plus rated.

- 2.24.5 Terminate cables at the Fiber Optic Patch Panels with “LC-Type” Fiber Optic Connectors
- 2.24.6 Additional labeling on the fiber optic patch panel is required to identify which type of fiber is terminated on the bulkheads in the panel. All connectors and bulkheads shall be color coded with Aqua for Multimode fiber type.
- 2.25 Each fiber optic cable shall contain the quantity of strands of optical fibers as detailed on the drawings.
- 2.26 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.
- 2.27 Acceptable cables shall be:
 - 2.27.1 Commscope Multimode – Systimax LazrSpeed 550 OM4
- 2.28 Above glass types are an example of product names per manufacturer. Confirm requirements for indoor/outdoor, riser and plenum rated cable with riser drawings and site plans. Part numbers for composite style cable will vary greatly. Confirm part numbers with manufacturer.

Category-6 Station Cable

- 2.29 Contractor shall provide Category-6 UTP cable to each Data, Voice, IP Page, Audio-Visual Data Connection, IP Camera or any other location as indicated on the drawings and specifications. Provide quantity of cables as indicated on the drawings at each location.
- 2.30 Provide one Category-6, 4-pair unshielded twisted pair (UTP) cable from the nearest MDF or IDF location 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. Refer to the drawing details and specifications for jacket color requirements for each type of connection. Confirm color of cable jacket prior to ordering with the District IT Director. Contractor shall be responsible for providing the correct jacket color per the drawings per District Standards.
- 2.31 District Standard Color Code for Category-6 UTP shall be the following;
 - 2.31.1 Connections for all Voice and Data ports shall be Blue color.
 - 2.31.2 Connections for all Wireless Access Point ports shall be Green color.
 - 2.31.3 Connections for all Audio-Visual port applications shall be Yellow color. (Includes data connections at Flat Panels, Projectors, Sound System Cabinets, etc.)
 - 2.31.4 Connections for all Security and Video Surveillance ports shall be Orange color.

2.32 The cable shall be UL or ETL rated and UL verified in compliance Category-6 EIA/TIA standards. Approved cables for Network Infrastructure System:

2.32.1 Commscope – CS37R

2.33 Where data cables are indicated to run underground, Contractor shall use a Category-6 flooded cable; CommScope - Ultra Media Series - #6NF4

Category-6 Outlets

2.34 Unshielded twisted pair Category-6 outlets shall be an RJ45 Enhanced performance type 8-position / 8-conductor modular jacks and shall comply with Category-6 performance requirements. Provide single port, dual port, four port or quantity as indicated on the floor plans at each outlet location. All outlets shall be wired in an EIA/TIA 568B configuration.

2.35 Provide Category-6 inserts, wired for EIA 568B. Provide installation kits for all locations furnished with Category-6 UTP cabling.

2.36 Refer to the detail drawings for color of the Category-6 outlets required. Contractor shall be responsible for confirming all color requirements prior to ordering.

2.37 Provide the following Category-6 UTP data connector per Network Infrastructure warranty requirements;

2.37.1 Commscope - USL Series USL600

2.38 Network IP Cameras - Provide data connections for IP-Based Camera Outlets terminated at the Camera location as shown in the drawing details. Provide surface mount box by Commscope Series 2-Port #M102SMB-B-262. Label the cables and faceplate the same as standard data outlets. The location shall also be furnished with a blank weather-tight faceplate to protect the data termination until the cameras are installed.

2.39 Cables must be terminated at the data outlet with the Commscope termination tool per District Standards.

Augmented Category-6 Outlets

2.40 Unshielded twisted pair Augmented Category-6 outlets shall be an RJ45 Enhanced performance type 8-position/8 conductor modular jacks, and shall comply with Augmented Category-6 performance requirements. Provide single port, dual port, four port or quantity as indicated on the floor plans at each outlet location. All outlets shall be wired in an EIA/TIA 568B configuration.

2.41 Provide unshielded Augmented Category-6 inserts, wired for EIA 568B. Provide unshielded installation kits for all locations furnished with Augmented Category-6 UTP cabling.

- 2.42 Augmented Category-6 Outlets shall be provided at all WAP locations. Refer to the detail drawings for color of the Category-6 outlets required. Contractor shall be responsible for confirming all color requirements prior to ordering.
- 2.43 Provide the following unshielded Augmented Category-6 UTP data connector per Network infrastructure warranty requirements:
 - 2.43.1 Commscope UNJ 600 Series UNJ600

Outlet Faceplates

- 2.44 Provide a two-port faceplate for all one and two port outlet locations. Provide blanks for all unused openings.
- 2.45 Provide a four-port faceplate for all three and four port outlet locations. Provide blanks for all unused openings
- 2.46 Faceplates to be provided with label windows and two to six ports, depending on requirements. Standard District color shall be white and standard faceplates are to be single gang, unless otherwise noted on drawings. Panduit Mini-Com Executive Series Faceplates. Blank inserts shall match faceplates. Provide blanks for all unused openings.
- 2.47 Contractor shall provide a single gang 6-Port Faceplate for the Teacher's "3P LO" Wallplate location where shown on the floor plans. Three (3) Ports will be used for the data cabling outlets, Two (2) Ports will be used for the 3.5mm Audio Microphone Input/ALS System Base Audio Output Panduit #CM35MSCWHY and the last port shall be furnished with a blank insert. Contractor shall furnish and install 6-Port Faceplate and all data, Audio-Visual and blank inserts. Coordinate installation with the 27 20 00 Contractor. See the Classroom A/V System Diagram in the Detail Drawings for additional requirements.
- 2.48 All voice trunk/modem locations shall be provided as single port outlets. Requirements shall be the same as a single port data outlet as shown on the Technology Legend.
- 2.49 Wall Mounted Telephone Outlet - Provide single port small surface mounted box Commscope Series 1-Port #M101SMB-B-262, in White, for Wall Mounted Telephone Outlets. Mount data outlet in single gang J-Box at Telephone location. Provide blank faceplate with 3/4" hole for pass-through of patch cable to telephone. Label the cables and faceplate the same as standard data outlets. Telephone device District furnished and installed. Provide 2-Foot Category-6 Patch Cable.
- 2.50 Network IP Cameras - Provide data connections for IP-Based Camera Outlets terminated at the Camera location as shown in the drawing details. Provide surface mount box by Commscope Series 2-Port #M102SMB-B-262. Label the cables and faceplate the same as standard data outlets. The location shall also be furnished with a blank weather-tight faceplate to protect the data termination until the cameras are installed.

- 2.51 **All faceplates and surface mount outlet boxes shall be furnished with label windows. All labeling shall be installed within the label window.**
- 2.52 All data outlet faceplates shall have a unique sequential identification number in the label window of the faceplate. Hand-written labels are not permitted. All color schemes shall be approved by the customer prior to installation.
- 2.53 Colored outlets 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.
- 2.54 **All labels will be installed under label window. Labels adhered to the surface of the faceplate will not be accepted per District Standards.**
- 2.55 Final labeling format for all outlet faceplates and patch panels will be made by the Director of the District IT Department.
- 2.56 Reference the drawings for special outlet configurations or plate requirements.

PART 3 – VIDEO SURVEILLANCE REQUIREMENTS

- 3.1 Provide (2) Category-6 UTP cables from the IDF Cabinet to each camera location. All cables installed in underground conduit shall be rated for Wet Location. The cables shall be terminated in the junction box on a surface mount box. The Exterior Camera location J-Boxes shall be provided with a weatherproof grommeted stainless steel faceplate for future use. Label the faceplates on the inside with an adhesive label so the labels won't fall off in addition to the standard labeling of the surface jack.
- 3.2 Refer to the floor plans for the Camera locations. Locations near corners of the building shall be installed as close to the corner as is allowed by the building's structural members. Cameras and mounts will be District furnished and installed. Refer to the drawing details for additional requirements.

PART 4 – WIRELESS ACCESS POINTS (WAP) REQUIREMENTS

- 4.1 The District will provide all Wireless Access Point units and programming will be by the District IT Department. The Contractor shall install each Wireless Access Point as required and provide patch cord installation at the WAP. The Contractor shall provide a key sheet list including the room number, location, and MAC address of each device installed to the District IT Department.
- 4.2 Provide minimum 10' Service Loop on the cable at each WAP location stored above the WAP location on J-Hooks as shown in the detail drawings. Locations in areas without accessible ceiling shall have the slack stored in the ceiling at the point where the run transitions to conduit from the nearest accessible ceiling space. Full conduit runs to the IDF Closet do not require a Service Loop.

- 4.3 Refer to drawing details for installation requirements for WAP locations. The Contractor shall furnish and install all mounting brackets for the WAP locations in the accessible ceiling and for the wall mounted locations.
- 4.4 Contractor shall install the Exterior WAP units at the locations shown on the drawings. Coordinate with the District IT Department for all mounting brackets and connection of all WAPs.
- 4.5 Wireless Access Points shall be plugged into the data outlet mounted inside the Ceiling Mounted Audio-Visual Enclosure. Contractor shall furnish and install Cat-6A Patch Cable, length as required, from the WAP to the Audio-Visual Enclosure.

PART 5 – INSTALLATION

- 5.1 Upon completion of 10% of the cabling installation, the Contractor shall notify the Project 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 Project Engineer for the scheduling of 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. The Contractor shall be responsible for adhering to the findings and a follow-up inspection will not be provided.
- 5.2 Pull strings shall 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 for the exterior site conduits.
- 5.3 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 managements or “D” rings in the equipment closet.
- 5.4 Data Contractor shall supply protective bushings or slide on rings at the ends of all exposed conduits used for data system cabling. This is to include all conduits installed for any future data cabling requirements. Contractor shall submit planned protection bushings prior to installation of cabling for approval.
- 5.5 Velcro cable management straps are required on the cabling in the rear section of the vertical managers in the equipment racks. Straps shall be a maximum of 12” apart. At a minimum, Velcro straps shall be provided at each point the cables are routed to the patch panels from the main bundle.
- 5.6 Every fiber in every fiber optic cable must be terminated at both ends of a fiber patch panel in the MDF/IDF closet or cabinet location. Termination shall be accomplished using the correct style of connectors as directed by the District with a strain relief boot. All connectors shall be of the same manufacture to ensure compatibility. Polarity of fiber strands must be observed at all times.

5.7 Labeling

- 5.7.1 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 patch panel point. A printed label shall be placed at each of the following locations:
 - 5.7.1.1 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).
 - 5.7.1.2 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).
 - 5.7.1.3 On the cable at the terminal strip prior to termination point. 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).
 - 5.7.1.4 On the face of the patch panel, provide a ¾" by ¾" label with a letter or number identifying the patch panel designation. For special purpose data connections such as WAP, Audio-Visual, IP Page and IP Camera ports, the label shall be designated with colored label icon or marker.
 - 5.7.1.5 On the face of the faceplate in the label holder window. The label shall be clearly defined with a minimum #10 font size.
- 5.7.2 Handwritten labels are not permitted. Where cable ID includes room number identification, the Contractor shall obtain written verification of final room numbers prior to beginning labeling (numbers on plans do not always match final room numbers). Cable pulling cross reference lists will not be accepted with final documentation.
- 5.7.3 Each patch panel port shall be identified with a unique sequential labeling scheme. Port identification labeling pattern shall be consistent throughout the project.
- 5.7.4 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.
- 5.7.5 All fiber optic and UTP feed cables shall be identified with 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 in the IDF/MDF closets at the site conduit entrance point, riser conduit entrance point and prior to entering either punch blocks or patch panels. Labels for fiber and copper feeds shall include both the name of the origination point and the destination point, house pair or house fiber strand count, cable composition (i.e., 12-Strand MM 50/125 LO; 6-Strand SM). See details for additional requirements.

- 5.7.6 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. Contractor shall be required to have the labeling scheme approved in writing by the District IT Director prior to manufacture or installation of the labeling.
- 5.7.7 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, with a label tag on each cable in the service loop. 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.
- 5.7.8 Refer to detail drawings for additional labeling requirements.
- 5.8 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.
- 5.9 All cables must be fastened to the building structure via “j-hooks” or an approved Category 6 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.
- 5.10 Where cables pass through a fire-resistant portion of the structure, conduit sleeves shall be provided to maintain the rating of 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.
 - 5.10.1 The 27 10 00 Contractor shall be responsible for fire-stopping all unused conduit sleeves in the ceiling or through rated walls. The Electrical Contractor shall be responsible for fire-stopping around the conduit or sleeve, unless the sleeve is installed by the 27 10 00 Contractor, in which case, the 27 10 00 Contractor shall be responsible for all fire-stopping requirements.

- 5.10.2 Expanding foam is not an acceptable sealant for any conduit opening. Contractor shall be responsible for complete replacement of the conduit and cabling in any conduit filled with expanding foam used as a sealant.
- 5.11 Fiber optic feed cables connecting to equipment racks from the MDF Room or from an adjacent IDF location, shall be installed with not less than a 20-foot service loop between the rack and mounted on the backboard. See drawings for fiber optic service loop requirements.
- 5.12 Provide 6 inches of cable slack at computer data system outlets inside conduit box.
- 5.13 In an accessible ceiling area, provide a 10-foot (stored in a Figure-8 configuration) service loop above the all data/voice outlet locations. Service loop must be securely tied up off of ceiling tiles or ceiling surface and supported at two opposite points. Neatly coil cable without exceeding minimum bend radius limitations. Do not provide length in excess of 15 feet, as it may cause improper test results and errors.
- 5.14 Do not provide a service loop in the MDF/IDF Room on the UTP cables, unless otherwise noted. Cables shall be neatly routed around the perimeter of the room to the cable runway from the point of entrance into the room.
- 5.15 The minimum bending radius for all cables and the maximum pulling tension shall not exceed manufacturer's recommendations.
- 5.16 Cables installed in manholes and pullboxes shall be supported with Velcro ties or loosely fitted UV rated tie wraps, on wall mounted cable support racks. The cables shall be clearly labeled in the manhole or pullbox.
- 5.17 Provide a full 360-degree loop of slack cable around manhole and pullbox interiors. Cables entering handholes from the bottom, shall not be allowed to touch the bottom of the cover when closed and shall not be pinched or crushed in any way.
- 5.18 Cable pulling shall use a split mesh grip over the cable jacket. Connection directly to optical fibers and copper wire conductors shall not occur.
- 5.19 When pulled through conduits, cable pulling lubricants shall be continuously applied to all cables and be specifically approved by the manufacturer.
- 5.20 Where cables are pulled through or pulled from a center 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.
- 5.21 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 tension 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.

- 5.22 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.
- 5.23 A pull string shall be placed with all UTP and paging station cables at the time of installation. Conduit runs and surface raceway for station cabling shall be furnished with a minimum 2-Ply spiral wrap style, pull string rated for 240 ft/lbs. pulling strength, such as manufactured by Greelee #431 or approved equal. Includes all conduit stubs and cables routed through open ceiling and cable trays. Pull strings shall be tied off in the junction box and in the ceiling. Provision for the installation of the pulls string shall apply to all empty and spare conduits as well. Single ply type pull string will not be accepted as a substitute for the 2-ply pull string.
- 5.24 A measuring pull tape shall be placed with all feed cables at the time of installation. Indoor riser and outdoor conduit runs between buildings designated for feed cabling, in excess of 150 feet shall be provided with a minimum ½" polyaramid style, measuring true tape pull string annotated with footage increments rated for 2500 ft/lbs. pulling strength, such as manufactured by Greenlee #39245 or approved equal. Conduit runs less than 150 feet shall be furnished with a ¼" polyaramid style, measuring true tape pull string annotated with footage increments rated for 1250 ft/lbs. pulling strength, such as manufactured by Greenlee #39243 or approved equal. Provision for the installation of the measuring pull tape shall apply to all empty and spare conduits as well. Standard twine style pull strings and standard nylon or polypropylene style pull ropes will not be accepted as a substitute for the polyaramid measuring tape pull string.
- 5.25 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.
- 5.26 All cables shall be new and extend continuously from each MDF or IDF backboard or rack to all outlet locations.
- 5.27 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) with 36" or within 12" of line voltage equipment or wiring where crossing.

- 5.28 Where OSP-Rated UTP cables or OSP-Rated fiber optic cables are routed exposed through ceiling for more than 50'-0", Contractor shall install the cable in innerduct or EMT conduit in the ceiling. Innerduct installed in the accessible ceiling space shall be a minimum of riser rated and minimum of 1" in diameter. Innerduct shall be supported minimum of every 3-feet to the structural members.

TESTING

- 5.29 All Category-6 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-6 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-6 requirements by the EIA/TIA.
- 5.30 All Augmented Category-6 cables shall be point to point (link) tested after installation/termination and verified to operate at minimum 10000Mbps. Performance of installed cables shall satisfy all current addendums to the EIA/TIA 568A standard for Augmented Category-6 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 Augmented Category-6 requirements by the EIA/TIA.
- 5.31 Upon completion of testing cable links for both copper and fiber optic cabling, the Contractor shall supply a copy of the original database files downloaded from the tester in original format on a USB Flash Drive. Contractor shall provide with the testing 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 (i.e., Fluke Linkware software program).
- 5.31.1 The manufacturer's software program will be used by the Project Engineer to review all test results, and then turned over to the District to keep as their record copy with the final approved test results. Provide (3) copies of tests on USB Flash Drives. Do not submit test results for review in Excel or PDF file formats, as the submittal will be rejected and not reviewed.
- 5.32 Contractor will repair or replace cable runs or connecting hardware that do not meet specified criteria.
- 5.33 Upon completion of submittal of original test results, and after review and approval of those results, the Contractor shall provide testing equipment and personnel to randomly re-test 10% or 20 drops minimum, whichever is greater, of all UTP cable locations on the campus in the presence of the designated District Representative and Project Engineer. The District Representative shall choose which cables are to be re-tested. If 10% of the re-tested cables fail to match the previously submitted original tests, the Contractor must hire an independent testing firm to re-test all UTP cable on

the campus, at no cost the customer. All cables which do not meet the specifications criteria as determined by the independent test report, shall be replaced and re-tested by the Contractor at no cost the District. Final sign-off of the testing shall be approved after receipt of all other documentation.

- 5.34 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 1500nm. All fiber strands shall be tested with an OTDR (Optical Time Domain Reflectometer). All fiber test results shall contain final source and destination information that matches IDF or MDF labeling shown on the fiber optic patch panels and final documentation. OTDR tests results shall be included with the copper test results and submitted with the tester's software for review. Do not submit test results for review in Excel or PDF file formats, as the submittal will be rejected and not reviewed.
- 5.35 Test procedures shall comply with EIA/TIA 526-14 Method B. Test results shall meet the minimum following criteria:
- 5.35.1 Fiber optic test results shall not exceed 2db total attenuation loss in addition to inherent loss published by manufacturer tested at minimum 2000 Mhx for 805nm and 500 Mhz for 1300nm for the fiber optic cable.
- 5.35.2 Test all data cable minimum Category-6 UTP cable to test results for "Channel Testing" requirements @ 250 Mhz per current EIA/TIA requirements. Any cables which do not meet these minimum requirements shall be replaced or repaired at no cost the District.
- 5.35.3 Test all data cables minimum Augmented Category-6 UTP cable to test results for "Channel Testing" @ 500 Mhz per current EIA/TIA requirements. Any cables which do not meet these minimum requirements shall be replaced or repaired at no cost the District.
- 5.36 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 utilized shall be the same fiber core size and grade of glass 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. Test jumpers shall be "zeroed out" before testing of fiber stands begins.
- 5.37 Final As-Built Drawing Submittals – Provide (1) Electronic copy on USB Flash Drive of "E-size" As-Built drawings in AutoCad (2021 or newer version) format and (2) 30"X42" size Hard Copy of the As-Built Drawings. A Hand marked-up copy of the original construction drawings will not be accepted as the final As-Built drawing submittal. Final As-Built drawings shall include copies of the floor plan drawings of each building, detailed elevations of each MDF or IDF locating all equipment, quantities outlets and speaker locations, locations of all sleeves and identification of all final cable routes. In addition, the drawings shall include all outlet locations with cable identification numbers.

END OF SECTION

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 21 00 Contractor shall be responsible for providing all cables required and for coordinating and supervising the cable installation. The 27 21 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 current full-time employees with CTS, Extron XTP Systems Engineer, Extron TLP programming certifications, and Extron Global Configuration Certification. (include certifications with submittals).
- 1.18 The successful bidder shall have installation staff with CTS-I certification and Extron Advanced A/V Certifications. Contractor must have a minimum of (8) full time certified installation technicians with Extron Certifications (include certifications with submittals).
- 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 General Submittal Requirements

1.26.1 Phase I Submittal shall be made in electronic format within (20) working days after the award of the contract by the District. This submittal shall include the following:

- 1.26.2 Complete Bill of Materials in Excel Spreadsheet format with bills of quantities, including all materials, components, devices, and equipment required for the 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:
 - 1.26.3 Description and quantity of each product.
 - 1.26.4 Manufacturer's Name and Model Number.
 - 1.26.5 Manufacturer's Specification Sheet or Cut Sheet. Material Cut Sheets shall provide detailed product information and shall be original manufacturer product bulletins. Copies of material information from vendor websites shall not be considered equal and will not be excepted.
 - 1.26.6 Material Cut Sheet part number provided shall be highlighted or provided with an arrow directed at the corresponding part number.
 - 1.26.7 Specification Item Number referenced for each required product or if not shown in the specifications, Drawing Detail Number being referenced. (ie; Spec. 271000 Item 2.1 or DWG E4.15/#1)
 - 1.26.8 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.
- 1.27 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 in a CAD Software. Submission shall include electronic print copies to match the contract drawings, and Phase II submittals drawings shall include the following.
 - 1.27.1 MDF and IDF equipment rack or cabinet elevations will be required to be provided including cable routing, grounding, support, UPS, network electronics, etc. and position of all components in the rack or cabinet.
 - 1.27.2 Provide labeling plan which identifies the proposed scheme for identifying all components including Racks, patch panels (fiber and copper), site distribution feed cables, horizontal station cables and site conduit systems (handholes, pullboxes, etc.).
- 1.28 Common submittal mistakes which will result in submittals being rejected:
 - 1.28.1 Not including the qualifications of the installing Contractor Company and Contractor's Staff.
 - 1.28.2 Not including all items listed in the above itemized description.
 - 1.28.3 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 (provided for the project) or crossing out the items which are not applicable.

- 1.28.4 Not including actual manufacturer’s cut sheets or catalog information of proposed products.
 - 1.28.5 Do not provide website sales pages instead of Material Cut Sheets. Printing the entire web page with advertising and non-applicable items or information will not be acceptable.
 - 1.28.6 Do not include multiple manufacturers for similar products and do not indicate “or approved equal” or “to be determined later” statements. The products being submitted must be the products installed.
- 1.29 Component Samples and Mock-ups
- 1.29.1 Provide one full size installation sample mock-up of a normal wall faceplate for approval. All samples are to be fully labeled per these specifications. Samples are to be delivered to the Construction Manager’s office on site prior to installation.
 - 1.29.2 All sample mock-ups are intended to represent the components that are to be installed as part of this project. They are to be provided with all associated components and labeling necessary to make up a complete mock-up. Installation shall not proceed until the Owner’s Representative has approved the samples. Once samples and other documents have been submitted and inspected by the Owners Representative approved, they shall be retained. Any installation that does not meet this standard shall be replaced or re-worked as approved by the Owners’ Representative at no cost to the project.
- 1.30 The Contractor shall make a written request directly to Johnson Consulting Engineers for electronic drawing files (CAD). As a part of the written request, please include the following information:
- 1.30.1 Clearly indicate Project Name and Client, Johnson Consulting Job Number (located in bottom left corner of JCE Engineering Stamp) and each drawing Sheet Number required (i.e., E1.1, E2.1, E4.1 etc.).
 - 1.30.2 Identify the name, Company, Title, phone number, mailing address and e-mail address of the person to receive the files.
 - 1.30.3 Detail or Riser diagram sheets, System Schematic drawings or any other drawings other than floor plans or site plans, will not be made available to the Contractor.
 - 1.30.4 Files will only be provided in the AutoCAD format in which they were created (i.e., version 2015 or version 2016). Files will not be made available in REVIT format.
- 1.31 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 and delays in requesting files will not alleviate the Contractor from submitting required documents within the required timeline.

- 1.32 Contractor shall be responsible for the complete provision and installation of all components as specified herein. The Contractor shall provide all tools, equipment, fixtures, appliances, ancillary piece parts and hardware as necessary to complete the assembly and installation as requested. The Owner's Representative may conduct scheduled or unscheduled inspections of the Contractor's work at any time during construction. All work included in the scope assigned to the Contractor that is associated with this project shall be accomplished in a workmanlike manner, installed and assembled plumb, level and square. The product shall be delivered to the Owner finished complete, and ready to operate according to the manufacturer's specifications.
- 1.33 All installation work shall be completed to the standard of the samples approved by the Owner's Representative during the submittal process. Any products not installed to the quality detailed in these specifications and approved in the submittal process shall be reworked by the Installer to the satisfaction of the Owners Representative at no additional cost to the Owner.
- 1.34 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

- 1.35 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

- 1.36 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.
- 1.37 Use steel brushes on exposed metal work to carefully remove rust, etc., and leave smooth and clean.
- 1.38 During the progress of the work, keep the premises clean and free of debris.

GENERAL COORDINATION

- 1.39 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.

- 1.40 All LED Projectors shall be commercial grade and shall be provided with a minimum three (3) year manufacturer warranty. Consumer grade projectors will not be acceptable as an alternate.
- 1.41 Projectors are Contractor furnished and installed, unless otherwise noted .
- 1.42 Contractor shall provide a spreadsheet for the District provided asset tags for all newly installed AV equipment. Contractor shall provide the populated tag list at the end of the projector as part of their turn-over documents.
- 1.43 Contractor shall coordinate assignment of ALL installed IP addressable equipment. The District will provide a list of available IP addresses based of Contractors device count. Contractor shall provide a spreadsheet containing the IP and MAC addresses as well as each particular device location. This list shall also contain the Switch Port Number, and Label Description.
- 1.44 See the example below:

Room #	Device	IP (Static)	MAC	WallJack Label	Switch #	Switch Port		IDF#
								Switch # - (From top to bottom - 1,2,3, ...- use A,B,C.. in label) Switch Port - (1 - 48)
2014	Extron	10.63.155.159	0000.0322.a32b	A1-A04	1	4	Example	IDF A1 -- Top Switch (A) -- Port 4
123	Extron	10.63.155.152	0000.0322.aabb	C1-B24	2	24	Example	IDF C1 -- 2nd Switch down In stack (B) -- Port 24
2201	Cisco AP	dhcp	0012.aaaa.12ab	A2-C35	3	35	Example	IDF A2 -- 3rd Switch down in stack (C) -- Port 35
2202	<device>	dhcp	0012.aa4a.12ab	A2-C36	3	36	Example	IDF A2 -- 3rd Switch down in stack (C) -- Port 36

PART 2 — PRODUCTS

Standard Classroom Audio-Video Requirements:

- 2.1 Contractor shall furnish and install all Audio-Visual system components as shown in the A/V system details and these specifications. Refer to the Audio-Visual System Diagram for additional information. The drawing details and specifications shall be considered as one overall document. Contractor shall provide system as a complete turn-key operational Audio-Visual systems.
- 2.2 Provide installation of Laser-Based Projectors, Projector Mounts, Ceiling AV Enclosure, all audio/video system components and all local wiring and shown on the drawings and in the specifications. Projector Mounts shall be located and installed per the drawings and specifications.
- 2.3 AppleTV Interface Device, Teacher’s Wireless Microphone System, Document Camera, Computer and Computer PC Monitors units shall be furnished by the District and installed by the District.
- 2.4 Each Classroom AV System shall have a Contractor furnished and installed Ceiling Mounted Laser Projector at the location shown on the floor plans. The Projector shall serve at the presentation location within the classroom for all video. The Projector will be connected to the Classroom AV Switch in the Ceiling Mounted AV Enclosure. All audio will be routed to the system speakers. Audio output from the Teacher’s

Microphone System Based Unit shall be routed back to the AV Switcher and connected to the Microphone Input on the PoleVault Switch.

- 2.5 Provide Extron Global Configurator Plus and Global Configurator Professional software to be used to program all system components and all of the different types of systems installations. The Contractor shall include programming of all assets in each room system and the entire school site controls into the software from the central server location. The programming shall include assigning IP addresses, coordinate all IP addresses with the District IT Department.
- 2.6 **Provide lump sum of \$9,000 for the purchase of (4) Standard Throw Laser Projectors for the Relocatable Classrooms with Manufacturer's Extended Service Contract Whole Unit Exchange, 1 year in addition to the Standard Warranty.** Lump sum amount shall cover the Laser Projector and Service Contract invoice costs only plus tax. Actual make and model of Laser Projectors will be determined prior to installation.
- 2.6.1 Lump sum amount shall cover Laser Projectors and Service Contract invoice cost only plus tax. Shipping, Contractor mark-up, profit and overhead, installation, patch cables, programming and set-up, all mounting hardware and labor costs shall be included as part of the Contractor bid and not part of the lump sum amount. Actual make, model and final size of Laser Projectors will be determined prior to installation and shall be approved by the Project Engineer and District Project Manager prior to purchase.
- 2.6.2 Contractor shall submit an itemized spreadsheet to the Project Engineer, Architect, Construction Manager and District Project Manager for the monitors being proposed for purchase including the following information; Make, Model, Lumen Output, Native Resolution, Invoice Cost and Tax. The submittal shall include manufacturer cut sheets for each type and model submitted, with proper part numbers highlighted. The itemized spreadsheet shall detail each location with Room Number and the associated Laser Projector for that room. The spreadsheet shall be provided to the Construction Team a minimum of 20 weeks prior to the first proposed purchase date to allow enough time for approval, purchase and delivery of the Laser Projectors. The Contractor shall not proceed with purchase or warehousing of the equipment without written approval.
- 2.6.3 Laser Projector specifications based on Epson PowerLite L200W Commercial Grade Projectors. Any suggested Laser Projector equivalent must contain all input/output connections; shall provide as good or better minimum brightness, contrast ratio, native resolution and maximum display colors as the specified Laser Projector. Models not currently in production (discontinued) at the time of the submittal, will not be considered. Laser Projectors must have a minimum of (2) HDMI and (2) Audio Inputs, RS-232 Control Port and (1) 3.5mm Audio Output.
- 2.6.4 All Laser Projectors shall be commercial grade and shall be provided with a **minimum Three (3) year manufacturer warranty** Plus any specified Service Contract. Consumer grade Projectors will not be acceptable as an alternate.

- 2.7 Each Classroom AV System shall be furnished with a Projector at the front of the classroom in the location shown on the floor plans. The Projectors shall serve at the presentation location within the classroom for all video. The Projector will be connected to the Classroom AV Switch in the AV Enclosure. All audio will be routed to the system speakers.
- 2.8 Provide installation of projectors with audio/video components and all local wiring. Projectors shall be located per the drawings and specifications.
- 2.8.1 Projectors shall be furnished and installed by the Contractor. Coordinate exact model or manufacturer to be used to insure compatibility with A/V system drawings. Digital projectors must be able to fill, per the manufacturer's recommended image size at 100% of all projector performance capabilities, a 91" diagonal screen (16:10 aspect ratio). Throw distance shall not exceed 14'0" from the surface of the Markerboard. Projectors shall be the non-interactive type.
- 2.8.2 Special Set-Up and Testing Requirements - Contractor shall provide installation of the specified projectors, so that the image shall fit the designated image area and aspect ratio, without the use of the keystone (0% keystone requirement), image shift (Vertical and Horizontal) and zoom functions, or modification of the calibration settings. The image shall not be artificially manipulated to allow the image to fit the markerboard due to the placement of the projector mount or projector.
- 2.8.3 Projector must be installed level. The projector may not be tilted to achieve the proper image area throw coverage on the screen or use manual shift/keystone functions on the projector to compensate for the distortion caused by the projector being tilted. The Contractor must use the correct length pole on the mount to achieve the proper image throw, regardless of the pole provided with the ceiling mount kit. Contractor shall be responsible for determining the correct length 1-1/2" NPT pole prior to installation of the projector.
- 2.9 Contractor shall furnish and install the ceiling mounted projector support. Provide Extron Model PCM 340 ceiling mount projector support, 1.5" NPT threaded support pole with cable access hole, white color, by Premier Mounts Model #PWH-XXW (XX-Represents Length as required) and Premier Mounts Model PDS Plus W low profile universal projector mount. All mounting systems shall be provided with vandal resistant hardware. Pole lengths will vary, based on drop and throw requirements for each projector. See detail drawings for additional requirements.
- 2.9.1 Projector mounting plate shall be securely mounted to adhere with structural requirements for earthquake compliance. Contractor shall provide all hardware including anchoring systems, support brackets and modifications to the ceiling. Contractor shall submit proposed mounting modifications to the Project Engineer prior to installation of the projector.
- 2.10 Provide Extron PPS 35 sensor from the ceiling mounted AV Enclosure for each Classroom AV System to allow for clipping of the audio when the school's intercom paging system

is activated. Contractor will be required to run a cable to the nearest Analog Intercom Speaker location to pick up the paging device's page announcements. Attach sensor per manufacturer's instructions. Do not route to an Exterior Horn, as these are on a different zone.

- 2.11 Each Classroom AV System shall be provided with a District furnished and installed Wireless Microphone System. Microphone system base unit's Mic/Audio Output shall be connected to the AV Switch in the Ceiling AV Enclosure location. The modular keystone type 3.5mm Audio Input Adapter for the data wallplate shall be provided by the 27 10 00 Contractor. Coordinate with the 27 10 00 Contractor. Provide audio cable to the AV Switch as a mixed microphone or audio Input. Terminate cable on solder terminals on the rear of the faceplate. See A/V System Diagrams for additional requirements.
- 2.12 Contractor shall furnish system components as shown in the A/V System Diagram, detail drawings and specifications. Coordinate with the District's IT Department for installation of cabling between the Projector and the peripherals. Provide Extron Digital PoleVault Audio-Visual System with (1) Input Wallplate and (2) Ceiling Mounted Speakers in each Classroom. Refer to detail drawings for exact installation configuration and required parts.
- 2.13 Teacher's interface wall plates; Each classroom shall be furnished with (1) Dual HDMI Input wallplate location as well as a Stand-Alone ALS 3.5mm mixed Audio Output for the ADA Assistive Listening System connected to a Portable ADA ALS Transmitter as needed. The Teacher's PC will serve as the Main Audio-Visual interconnection device to the system. Provide all local cabling and patch cables for the system. See Classroom A/V System Diagram for Input Wallplate and other Audio-Visual System component requirements. Provide the following interface at the Teacher's wallplate;
 - 2.13.1 Provide (1) Dual HDMI Digital Input Wallplate at the Teacher's Interface (LO) location where shown on the drawings; Wallplate shall be provided with Dual HDMI Inputs in a 2-Gang Decora Faceplate. The Teacher's wallplate shall be provide (2) separate HDMI Inputs to the Digital Polevault Switch. Provide (1) Extron #PVT HDMI Decora Style wallplate.
 - 2.13.2 Provide (1) Stand-Alone Assistive Listening System Audio Output for the data wallplate provided by the 27 10 00 Contractor in a single gang Decora Faceplate. and unbalanced audio cabling to the mixed audio output of the Extron Switcher.
 - 2.13.2.1 The modular keystone type 3.5mm Audio Output Adapter for the data wallplate shall be provided by the 27 10 00 Contractor. Coordinate with the 27 10 00 Contractor. See A/V System Diagrams for additional requirements
 - 2.13.2.2 Provide a unbalanced audio output from the PoleVault Switch to the wallplate. Provide audio cabling and terminate on solder terminals on the rear of the wallplate.
 - 2.13.2.3 Clearly label wallplate and cabling as "ADA ALS Output".

- 2.13.2.4 See the Classroom A/V System Diagram in the Detail Drawings for additional requirements.
- 2.13.3 All Audio-Visual wall plates shall be the Extron Decora style. Color of plates is to be confirmed by the Contractor prior to installation. The wallplates require a dual gang box and faceplate. All wallplates shall be white in color, unless otherwise noted on the drawings.
- 2.13.4 Contractor shall provide a single Extron Cat-X cable from HDMI Input Wallplate to the PlenumVault switch. No other cable will be considered equal.
- 2.13.5 All voice and data cabling at the Teacher's locations shall be furnished and installed by the 27 10 00 Contractor.
- 2.13.6 Contractor shall furnish and install (2) 12-Foot HDMI Patch Cables and (1) 10-Foot 3.5mm Audio Patch Cable at the Main Teacher's Interface wallplate in each room. All AV patch cables shall be factory manufactured. Contractor shall provide each cable at a length of 12-feet for the connections to the Teacher's PC/Laptop and Document Camera from the Main Interface wallplate. Provide Extron HDMI Ultra Series high speed patch cables or approved equal. See AV Patch Cables Section for requirements.
- 2.13.7 Data Patch Cables shall be furnished and installed by the 27 10 00 Contractor.
- 2.14 Provide Extron Model MLC Plus 200 Control Panel designated as (LC) Local Control symbol on the drawings. Refer to the
 - 2.14.1 MLC Control Panel shall be connected to the 12VDC power supply installed in the Ceiling AV Enclosure. Provide low voltage power cabling from the power supply to the Control Panel.
 - 2.14.2 Provide an RS-232 Control Cable connection from Control Panel to the PlenumVault Switch in the Ceiling AV Enclosure. Refer to the Classroom A/V System Diagram for other requirements.
 - 2.14.3 Provide an RS-232 Control Cable connection from Control Panel to the Ceiling Mounted Projector. Refer to the Classroom A/V System Diagram for other requirements.
 - 2.14.4 Provide (1) Category-6 UTP patch cable from the AV Switch to the MLC Plus Control Panel (LO) location in the Classroom where shown on the floor plans. Provide length of cable as required to connect from the ceiling enclosure to the control panel. Patch cable lengths over 25 feet must be constructed of solid conductor cable. Stranded conductor cable will not be accepted. All cables must be factory manufactured. Field constructed or modified cables will not be accepted.
 - 2.14.5 Program Teacher's PC or Laptop Computer to show a quick link on screen for emulation of the MLC Plus Control Panel buttons and functions. Teacher shall be able to control input access from either the MLC Plus Control Panel or the PC/Laptop. Teacher shall be able to access the control panel function with a single APP quick link.

- 2.14.6 Designate buttons on MLC Control Panel for all HDMI inputs. Inputs shall be labeled as follows; (Main Input Wallplate) HDMI Input #1 – Computer 1, HDMI Input #2 – Document Camera. All inputs on the wallplates shall be labeled with the same designations as shown on the MLC Control Panel. Confirm all labeling requirements with the District IT Department prior to installing the MLC Control Panels.
- 2.14.7 Provide Control Panel with an “AV Mute” Button to mute Ceiling Speakers.
- 2.15 Accessible Ceiling Space - Contractor shall provide a ceiling mounted enclosure. Provide Extron Digital PVS 407D IP 4-Input switcher/amplifier in the ceiling mounted A/V Enclosure. The components do not have to be plenum rated or the enclosure sealed, as the ceiling is not a plenum environment. The Ceiling A/V Enclosure, Model #PVM 220, shall be installed in the accessible ceiling above or near the Flat Panel Monitor location. The location of the ceiling enclosure shall be as shown on the floor plans and the Audio-Visual details. Confirm typical placement of the enclosure with the Project Engineer prior to installation of any AV cabling.
 - 2.15.1 Each ceiling enclosure will be provided with a two-port data outlet on a surface jack inside the A/V Enclosure by the 27 10 00 Contractor. Coordinate location of the data outlet with the 27 10 00 Contractor.
 - 2.15.2 Each enclosure will be furnished with power hard-wired by the Div. 26 Electrical Contractor.
 - 2.15.3 Audio-Visual Enclosure will house the AV PoleVault Switcher as well any system power supplies.
 - 2.15.4 Provide (1) 2-foot long, Category-6 UTP patch cable from the data outlet in the enclosure to Ethernet Port #1 on the AV Switch. The incoming network connection must be connected to Ethernet Port #1 on the AV Switch. Color of patch cable TBD by the District IT Department. Confirm all patch cord colors prior to ordering.
 - 2.15.5 Contractor shall furnish and install (1) HDMI cable from the AV switch to the Projector’s HDMI Input #1 and (1) HDMI Cable to the District furnished and installed AppleTV Device. Coordinate location of AppleTV with District IT Department. All HDMI patch cables shall be factory manufactured. Contractor shall provide length of cable as required to make the connection from the switch to the Flat Panel Monitor. Provide Extron HDMI Ultra Series high speed patch cables (or approved equal).
- 2.16 Provide (2) Extron Flat Field Ceiling Speakers shall be furnished in the Standard Classroom Model #FF120. Standard Classrooms are to be provided with (2) speakers. Confirm quantity of speakers as shown on the floor plans for each room. Color of speakers shall be white.
 - 2.16.1 Speakers shall be provided with a minimum 18AWG speaker wire to the AV Switch.
 - 2.16.2 Speakers shall be provided with seismic cable attached to the roof structure above. Refer to the drawing details for the installation requirements.

- 2.16.3 Each Speaker shall be connected to a separate channel on the AV Switch Amplifier Output @8-Ohms.

Portable ADA Assistive Listening System

- 2.17 The Assisted Listening System shall be furnished and installed to meet CBC Section 11B-219 and comply with CBC Section 11B-706 and the ADA requirements for hard-of-hearing. Contractor shall furnish (1) Portable ADA Assistive Listening Systems Kit that may be used for Classrooms.
 - 2.17.1 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.”
 - 2.17.2 The CVUSD has determined that a portable ADA Assistive Listening System shall be provided for the installed Classroom Audio-Visual Systems. Contractor shall provide the ADA Systems as shown in the project specifications.
 - 2.17.3 Provide for each Kit; A self-contained portable wireless FM transmitter and receivers inside a self-contained carrying case. Portable ADA Assistive Listening system shall be as manufactured by Williams Sound Corporation, Phone 1-800-843-3544. Provide self-contained FM based system Model #FM ADA Kit 37 RCH with rechargeable batteries.
 - 2.17.3.1 Kit Contains; (1) PPA T46 transmitter, (4) PPA R37 receivers, (4) HED 027 headphones, (1) MIC 090 Mini Lavalier microphone, (1) MIC 049 conference microphone, (1) CCS 029 carrying case, (1) NKL 001 neck loop receiver, (1) ADA wall plaque and (5) BAT 026-2 “AA” batteries
 - 2.17.4 Contractor to provide CBC and ADA compliant wall placards for each Classroom. Contractor shall a CBC/ADA Compliant portable ALS Equipment, this shall be furnished and supplied to the designated representative of the Client, along with complete documentation of the materials provided. Where applicable, deliver equipment in the original manufacturer's supplied packaging.

Training

- 2.18 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.
- 2.19 **Contractor will provide a minimum of 8 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.
 - 2.19.1 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.

Audio/Video Patch Cables

- 2.20 All patch cables must be factory manufactured. Cables may not be field modified or altered. Length of cable shall be as required by the specification section. If length is not specified, the cables shall be the nearest factory manufactured length above the minimum distance required.
 - 2.20.1 Audio Cable Assemblies 25-feet in length or less; All 3.5mm stereo audio cable assemblies shall be a male-to-male cable fully shielded cable with 3.5mm bayonet style connectors. Extron Mini Audio Cables Series or equal. Provide minimum length of 6 feet.
 - 2.20.2 Teacher's Wallplate 12-foot HDMI Patch Cable Assemblies; All HDMI patch cables must be 4K/30 verified and must conform to the HDMI Premium cable standards. Patch cable shall be Extron HDMI Ultra Series High Speed patch cables (or approved equal by Liberty AV). Length of patch cable shall be as required for proper operation. Patch cables for Teacher's Input Wallplate locations shall be furnished with a 90-Degree connector at the Input Wallplate connection.
 - 2.20.3 HDMI Patch Cables 1.5-feet to 15-feet in length for Installation Connections; All HDMI patch cables must be 4K verified, ultra-flexible construction and must conform to the HDMI High Speed cable standards. Patch cable shall be Extron HDMI Ultra Series High Speed patch cable assemblies (Or Approved Equal). Length of patch cable shall be as required for proper operation.
 - 2.20.4 Fiber Optic/Copper Hybrid HDMI Cable Assemblies 33-feet to 66-feet in length for Installation Connections; All HDMI patch cables must be 4K/30 verified and must conform to the HDMI Premium and High Speed cable standards. HDMI cable assemblies must be a Fiber Optic/Copper Hybrid construction with detachable ends. Cables shall be Hall Research CHD-DE* 4K Javelin™ Active HDMI Cable w/Detachable Ends or Kramer CP-AOCH Series High Speed. Length of patch cable shall be as required for proper operation.
 - 2.20.4.1 HDMI cable assembly must be installed with the manufacturer furnished "cable pulling sock". Damaged or inoperable cable assemblies due to improper installation procedures shall be replaced by the Contractor at no expense to the District. Please note Manufacturer's Cautionary Warning on product specification sheet – "DAMAGED DUE TO CONNECTOR BEING PULLED HARDER THAN 20 kg, IS NOT COVERED BY WARRANTY -

To pull cable through conduits or tight spaces, never grab the connector, as it is easy to exceed the force limit on the connector, instead, remove the detachable end, protect the connector using a cable pulling sock and make sure the force is applied directly to the cable jacket.”

2.20.5

2.20.6 Category-6 Patch Cables 25-feet or Less; Category-6 UTP patch cables shall be as manufactured by Leviton or Ortronics, or approved equal. Patch cables shall be provided with standard patch cable material.

2.20.7 Category-6 Patch Cables 25-feet or More; Category-6 UTP patch cables shall be as manufactured by Leviton or Ortronics, or approved equal. All patch cables in excess of 25-feet must be constructed with solid conductor wire to comply with the crosstalk requirements of the Category-6 standards

2.20.8 XLR patch cables shall be as manufactured by Hosa Edge Series or approved equal.

2.20.9 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.

2.21 NOT USED

2.22 NOT USED

2.23 NOT USED

2.24 NOT USED

2.25 NOT USED

[SPACE LEFT BLANK]

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 Provide lacing bars for cable management in all of the sound systems cabinets. Contractor shall be responsible for providing neatly dressed cable bundles within the sound cabinet. Cables shall be dressed separately for Microphone and line level cables,

speaker and monitor cables, control cables and power cables and video cables. All cables shall be neatly labeled with wrap around type written labels.

- 3.7.1 On the cable at the rear of the patch panel or termination 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 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 from the back. Run other cables on the right side of an equipment rack.
- 3.12 Cut cables (except video, camera and RGBS 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 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.
- 3.20 Patch Panel Assignments: Wire patch panels so that signal "sources" (outputs from) appear on the upper row or a row pair and "loads" (input to) appear on the lower row of a row pair.
- 3.21 Patch Panel Designation Strips: Use alphanumeric identifications and descriptive information on patch panel designation strips. Number the jack positions in each horizontal row sequentially from left to right. Letter the horizontal jack rows sequentially from top to bottom. Include the alphanumeric identification of each jack on the functional block drawings, and on reproductions of these drawings that shall be mounted in an appropriate location near the patch bays.
- 3.22 Each major component of equipment shall have the manufacturer's name, address, model number, and rating on a plate securely affixed in a conspicuous place. NEMA code ratings, UL label, or other data which is die-stamped into the surface of the equipment shall be stamped in a location easily visible.
- 3.23 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.
- 3.24 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.
- 3.25 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

- 3.26 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.
- 3.27 System field wiring diagrams shall be provided to the owner by the system Installer (Contractor) prior to completion of the installation.
- 3.28 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.
- 3.29 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.
- 3.30 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.
- 3.31 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

- 3.32 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.
- 3.33 Equipment Lists and Maintenance Manuals:
 - 3.33.1 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:
 - 3.33.1.1 Name, model, and manufacturer.
 - 3.33.1.2 Complete parts drawings and lists.
 - 3.33.1.3 Local supply for parts and replacement and telephone number.
 - 3.33.1.4 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.

- 3.34 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

- 3.35 The Contractor shall maintain record drawings as specified in accordance with these specifications, and as noted below.
- 3.36 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.
- 3.37 Final As-Built Drawing Submittals - Provide (1) hard bound copy of "E-size" As-Built drawings and (3) copies on USB Flash Drive in AutoCAD (2021 or newer version) format. A Hand marked-up copy of the original construction drawings will not be accepted as the final As-Built drawing submittal. Final As-Builts shall include copies of the floor plan drawings of each building, detailed As-built AV Diagrams including wire and connection type, speaker locations, locations of all final cable routes, including conduits. In addition, the drawings shall include all outlet locations with cable identification label information.

END OF SECTION

SECTION 27 51 16
INTERCOM / CLOCK SYSTEM

PART 1 - GENERAL

1.1 The Contractor shall provide additional clocks and intercom components to the existing wireless clock and existing analog intercom system. Refer to the drawings, and as described in these specifications as may be required as specified herein.

1.2 The contractor shall provide loudspeakers and clocks as shown on the drawings or as noted in these specifications. Provide and connect all conductors and terminal strips in cabinets and backboards necessary to provide for the functions and the requirements specified herein.

1.3 Related Specification Sections:

1.3.1 Section 26 01 00 - General Provisions

1.3.2 Section 26 05 33 - Conduit and Fittings

1.3.3 Section 26 05 19 - Conductors

1.3.4 Section 26 05 34 - Outlet and Junction Boxes

1.4 **Existing Intercom System is Bogen MultiComm 2000. Contractor shall match existing Intercom System components.**

1.5 **Existing Wireless Clock System is Innovation Wireless. Contractor shall match existing Wireless Clock System components.**

Quality Assurance

1.6 All items of equipment including wire and cable shall be designed by the manufacturer to function as a complete system and shall be accompanied by the manufacturer's complete service notes and drawings detailing all interconnections. The distributor must also provide complete installation of all wiring and devices or equipment. All conduit and standard backboxes will be furnished and installed by the electrical contractor. Supervised installation of the wiring and intercom/clock devices shall be permitted with the following conditions:

1.6.1 The intercom/clock system shall be warranted by the manufacturer's representative per the contract agreement.

1.7 The contractor shall be an established communications and electronics contractor that has had and currently maintains a locally run and operated business for at least five years. The contractor shall utilize a duly authorized distributor of the

equipment supplied for this project location with full manufacturer's warranty privileges.

1.8 The contractor shall show satisfactory evidence, upon request, that the supplier maintains a fully equipped service organization capable of furnishing adequate inspection and service to the system. The supplier shall maintain at his facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied.

1.9 UL Compliance: Comply with requirements of UL 50. The communication system supplied shall be listed by Underwriter's Laboratories under UL Standard 1459. A copy of the UL listing card for the proposed system shall be included with the contractor's submittal. The system shall also comply with PCC Part 68 Regulations.

1.10 Installation and start up of all systems shall be under the direct supervision of a local agency regularly engaged in installation, repair, and maintenance of such systems. The supplier shall be accredited by the proposed equipment manufacturers and be prepared to offer a service contract for system maintenance on completion of the guarantee period.

1.11 The agency providing equipment shall be responsible for providing all specified equipment and mentioned services for all equipment as specified herein. The agency must be a local authorized distributor of all specified equipment for single source of responsibility and shall provide documents proving such. The agency must provide written proof that the agency is adequately staffed with factory-trained technicians for all of the specified equipment. .

1.12 The contractor shall guarantee availability of local service by factory- trained personnel of all specified equipment from an authorized distributor of all equipment specified under this section. On-the-premise maintenance shall be provided at no cost to the purchaser for a period of one (1) year from date of installation unless damage or failure is caused by misuse, abuse, neglect, or accident.

1.13 Deliver products in factory containers. Store in clean, dry space in original containers. Protect products from fumes and construction traffic. Handle carefully to avoid damage.

Support

1.14 Telephone Support: Free telephone support must be provided during normal business hours from the manufacturer.

1.15 Remote Updates: All application software must be upgradable by modem without site visits and without interrupting normal operations of other applications.

1.16 Remote Maintenance and Diagnostics: The vendor must have full access to the system via modem to do all of the following without shutting down the system to users.

1.16.1 Direct access to data base

- 1.16.2 Direct access to error logs
- 1.16.3 Direct access to removable stoppage
- 1.16.4 Defragment files and drives.
- 1.16.5 Start up and shut down any or all voice processes
- 1.16.6 Run a program to check the disk

Submittals

1.17 **Group #1 Submittal** shall be made in electronic format within (20) working days after the award of the contract by the District. This submittal shall include the following:

- 1.17.1 Complete Bill of Materials in Excel Spreadsheet format with bills of quantities, including all materials, components, devices, and equipment required for the 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 - Description and quantity of each product, Manufacturer's Name and Model Number, Manufacturer's Specification Sheet or Cut Sheet and Specification Item Number referenced for each required product or if not shown in the specifications, Drawing Detail Number being referenced. (ie; Spec. 27 20 00 Item 2.1.3 and/or Detail #1/E4.15:
- 1.17.2 Material Cut Sheets shall provide detailed product information and shall be original manufacturer product bulletins
- 1.17.3 Equipment items which have individual components will require that all component parts be listed individually.
- 1.17.4 Description of any specialty backbox requirements
- 1.17.5 All wiring types required for installation of this system
- 1.17.6 Spare parts shall be listed individually to verify proposed quantity
- 1.17.7 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

1.18 **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. Each

submission shall include 'D' or 'E' size print copies to match the contract drawings, and
(1) USB Flash Drive copy

with files in a AutoCAD format. Building floor plan CAD files will be made available. 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 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.

1.18.1 Shop Drawings showing the complete floor plans showing the locations throughout the project of all receptacles, conduits, wireways, tray, pullboxes, junction boxes, equipment locations, and other devices.

1.18.2 Typical system riser diagrams, specialty equipment or rack elevations will be required to be provided, including equipment designations, punch block arrangements, and all intercom and other associated equipment

1.19 Common submittal mistakes which will result in the submittals being rejected:

1.19.1 Not including the qualifications of the installing contractor.

1.19.2 Not including all items listed in the above itemized description.

1.19.3 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.

1.19.4 Not including actual manufacturer's catalog information for proposed products.

1.19.5 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

Intercom / Class Pass Bell System

2.1 Existing Analog Intercom System Head-End is Bogen MultiComm 2000. Provide the following additional speakers and horns where shown on the drawings. Head-End Cabinet is existing in Head-End Room in Building 500.

2.2 Cross-Connect Paging Speakers and Exterior Horns as required through feed cables in the existing Head-End Closet and existing MDF Room. Refer to the detail drawings and site plans for the provision of the additional feed cabling.

2.3 Provide additional Speakers and Horns as shown on the drawings as follows;

2.3.1 Recessed accessible ceiling mounted speaker – Atlas/IED Part #DT12 1'x2' drop in type speaker with external tap selector, recessed ceiling enclosure

with perforated tile baffle and tile bridge. Speaker baffle shall be white power coat epoxy finish. Speaker shall be tapped at 2 watts each.

2.3.2 All ceiling mounted speakers shall be provided with a minimum of (1) 12-AWG ceiling support wire securely attached to the structure above as detailed in the drawings. The speaker shall not depend on the ceiling tile grid for support.

2.3.3 Surface mounted speaker – Atlas/IED Part #VP14ENC with square surface mount slanted enclosure. Provide 8” speaker plus baffle – Atlas/IED Part #VP14MB with white power coat epoxy finish and shall be attached to the enclosure with vandal-resistant screws. Speaker shall be tapped at a minimum of 5 watts. The speaker shall be surface mounted on the wall, over J-Box furnished by the Division 26 Contractor.

2.3.4 Recessed Exterior Paging Horn – Provide Atlas/IED Part #VP161-APF Vandal Proof Baffle, #APF-15T series Horn/Loudspeaker, and #161RES Stainless-Steel Series Enclosure. Unit must be weather and vandal resistant. All horns shall be tapped at 15 watts.

2.3.5 Surface Mounted Exterior Paging Horn – Provide Atlas/IED Part #VP161-APF Vandal Proof Baffle, #APF-15T series Horn/Loudspeaker, and #161SES stainless steel series enclosure. Unit must be vandal and weather resistant. All horns shall be tapped at 15 watts.

2.4 Each speaker location cable shall be individually home run to the IDF Closet Communications Backboard or Cabinet. Provide 1-pair, 18-AWG unshielded CMR rated speaker cable by West Penn #224 (or approved equal) to each speaker location. Terminate speaker cable on terminal strips at the backboard. All speakers shall be home run to the IDF location. Speakers/Horns may not be run in a series, unless otherwise shown on the drawings. All speaker runs shall be numbered and labeled with type-written wrap around labels.

2.4.1 Cross-connect the output from the amplifiers on the terminal strips to the speakers and horns. All connections shall be labeled at the terminal strip with the Zone and Building Name or Number.

2.4.2 All speaker cables installed shall contain all necessary conductors and/or cables to all devices shown on the Drawings and the Contractor shall make all necessary conductor terminations to all devices for a complete system.

2.4.3 All cables routed underground shall be suitable for wet location provided with UL listed wet location insulation or flooded type cable construction as manufactured by West Penn Aquaseal #AQ224 (or approved equal).

2.5 Contractor shall be responsible for testing all paging speakers and horns and ensuring the proper volume levels are set in the paging software, on the amplifiers and on the

speakers/horns. Provide (4) man hours for re-adjustment of the speaker's and horn's volume, per the District's requirements, 4 weeks after the building has been occupied by the students. Check with School Administrative Staff for areas that are either too loud or too soft. The final adjustments to the individual IP-Based speakers/horns, zone controllers, analog speakers/horns and amplifiers shall be documented and furnished as part of the As-Built documents for the project.

2.6 Wrap around labels are required on all cable connections at the rear of the amplifier, at the zone controller and at the terminal strip for all cabling to the speakers or connections between equipment. Label shall clearly define paging zones, room numbers or type of port. Label shall be Brady self-Laminating 1.2" x 1/5" wrap around type #29689 – (No approved equal

2.7 Interior Speakers shall be tapped at 2-Watts and Exterior Page Horns shall be tapped at 15-Watts each. Contractor shall provide Paging Amplifiers in the IDF Cabinet for the new interior Speakers and Exterior Horns.

2.8 Provide amplifiers for the analog paging speakers and horns connected to the Intercom System. Amplifiers shall be rack mounted in the IDF equipment rack or cabinet. Provide rack mount adapter brackets as required to mount one or two amplifiers in a single rack unit. Provide quantity of amplifiers to service the quantity of horns and speakers as shown on the drawings. Size of amplifier shall be determined by the load, plus 25% expansion capacity. Larger amplifier may be required for a single zone depending on quantity of horns and speakers requiring amplification. Contractor is responsible for providing sufficient power amplification to service all speakers and horns.

2.9 Provide amplifier choice based on load: Approved Models; JBL CSA series, 280Z/2120Z or approved equal by Ashly. Total amplifier wattage on each channel shall allow for 25% headroom with speakers tapped according to the specifications. Contractor MUST submit a line diagram showing all locations and tap values with amp load as part of the Phase II submittals.

Class Pass Bell Scheduling System

2.10 Contractor shall provide all programming for the new speakers and horns. Coordinate with the District Facilities Department and the School Administration for Pass Class Bell Schedule changes and zoning requirements.

PART 3 – WIRELESS CLOCK SYSTEM PRODUCTS

3.1 Wireless clock system is existing.

3.2 Acceptable clock manufacturer shall be by Innovation Wireless.

3.3 The Clock System design requirements shall be based on a wireless, FM-Based distribution system with clocks individually battery powered. The District Standard for Wireless Clock Systems is as manufactured by Innovation Wireless.

3.4 System shall operate on a 72MHz frequency. The 72MHz frequency transmitter efficiently sends time synchronization signals through commercial building materials to ensure all devices receive important time updates, even for Daylight Saving Time and after a power outage.

3.5 Contractor shall provide a five-year extended warranty on the clocks to the District

3.6 Clock locations shall be as indicated, and clocks shall be fully portable, capable of being relocated at any time.

3.7 Clocks shall not be installed until painting and other finish work in each room is complete.

3.8 Standard Clock shall be 13" Innovation Wireless Standard Krono Sync Series Analog Clock, with a black outer casing. Clocks shall be Part # 210001 (Battery) with the following features;

3.8.1 Heavy Duty Construction -Durable ABS Casing

3.8.2 Polycarbonate Lens (shatter resistant)

3.8.3 Battery (2 D-Cell Alkaline)

3.8.4 Automatically Adjusts for DST

3.8.5 Standard Analog clocks shall be wall mounted. Face shall be white, Standard Arabic 12/60 Numbering (Part # SA60) and the Hour and minute hands shall be black

3.9 Battery-operated analog clocks shall have up to a 5-year battery life. Battery life is based on common operating conditions and may vary due to installed site conditions. Installer will furnish clock batteries in accordance with Manufacturer instructions. Battery-operated analog clocks shall remember the time during changing of batteries.

PART 4 - EXECUTION

Wireless Clock System Installation Requirements

4.1 Clocks shall be wall mounted using the manufacturer furnished mounting template. The clocks shall be mounted using the vandal-resistant mounting pattern.

4.2 Install each clock per its model mounting specifications per manufacturer instructions and mounting instructions at the indicated location.

4.3 Prior to final acceptance, clean exposed surfaces of devices, using cleaning methods recommended by Manufacturer.

4.4 Remove temporary labels from clock faces. Do not remove labels from backs of clocks.

4.5 Provide training to Owner's representative on setting, adjusting and configuring device and routine maintenance.

4.6 Provide training to District representative on installing the software, adjusting and programming the transmitter, setting and adjusting system devices and routine maintenance.

4.7 All devices must be tested at their operational location under normal operational conditions to assure reception of signal

Intercom System Installation Requirements

4.8 Provide (2) cables for Intercom Paging Station connection from each IDF to the Intercom Head-End Backboard unless otherwise shown on the drawings. Provide (1) Multi-pair Shielded 15-Conductors, 22AWG Stranded conductors, Wet location as manufactured by West Penn AquaSeal #AQC3274 (or approved equal) and (1) Voice Multi-pair Unshielded 12-Pair, 22AWG Solid conductors, OSP-Rated as manufactured by Superior Essex #04-059-27 (or approved equal). Refer to the Voice/Data Riser Diagram in the detail drawings for size of feed cables to be provided.

4.9 For voice multi-pair feed cables, terminate all pairs on both ends of the cable on 66-Type Split termination blocks by Siemon Model #66M1-50 on an S89B Stand-Off Bracket (or approved equal). Follow standard voice color codes for termination.

4.10 For Shielded multi-pair feed cables, terminate all pairs on both ends of the cable on Terminal Strips. Follow standard color codes for termination.

4.11 Terminate cables at the IDF Cabinet location in a 18"H X 15"W X 4"D Telephone Terminal Cabinet with a ¾" Plywood backboard inside the Cabinet. The Div 26 Contractor shall install the Terminal Cabinet and the 27 51 16 Contractor shall furnish and install the plywood backboard. Mount Punch Blocks and Terminal strips inside the cabinet.

4.12 Speaker cables shall be terminated inside the Terminal Cabinet per Voice/Data Riser Diagram in the detail drawings.

4.13 Wiring enclosures, terminal cabinets, outlets, frames of cabinet racks and other enclosures shall be grounded. Furnish and install #8 type THWN, green grounding wire from main public address terminal cabinet to console equipment rack main terminal. Frame of console and all circuit wiring requiring grounding shall be grounded to ground system at equipment rack main terminal. All loudspeaker circuits and communication 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 control cabinet and the green grounding conductor of the power circuit serving the equipment.

4.14 Circuits shall be grounded as recommended by manufacturer or equipment to which they are connected unless otherwise specified.

4.15 All wiring shall test free of grounds and shorts.

4.16 All wiring for the complete system shall be new wire. Any wires pulled through in underground junction boxes shall be continuous with no splices in these boxes. The wiring shall be intact without cuts in the protective outer jacket. All splices shall be made at building communication cabinets or main backboard, using terminal strips in all cases.

4.17 All buildings which can't comply with CEC 800 -30 (FPN) # 4, shall be properly protected for lightning and static electric discharge. Provide all conductors entering or leaving the building within line fuses, or 188 type blocks with gas tube protectors.

4.18 All intercom wires and cables installed shall contain all necessary conductors and/or cables to all devices shown on the Drawings and the contractor shall make all necessary conductor terminations to all devices for a complete system.

4.19 All cables shall be installed within conduits, boxes, and cabinets unless where otherwise indicated approved on the drawings . Where open cable is approved all cables shall be neatly bundled and supported from the structure.

4.20 Where cables not approved for open wire interior applications, are routed more than 50'-0" through the building, install cables in innerduct or EMT conduit.

4.21 All cables provided shall be UL listed.

4.22 All cables shall be delivered to the site in unbroken packages. Packages shall be inspected and approved by the District Inspector before opening.

4.23 All cabling shall be identified in each terminal cabinet and junction box. Where cables are routed through underground handholes each building and each system shall be identified with wet location ID tags.

4.24 Console and Cabinet Rack Equipment Installation: All equipment within each console and cabinet rack shall be logically arranged for accessibility of convenient maintenance. Equipment shall be mounted on shelves or panels and shall be securely attached. All cabinets and/or racks shall be seismically anchored to comply with T24 regulations.

4.25 Amplifiers, power supplies and other heavy devices shall be mounted on steel shelves made by manufacturer of console and cabinet racks. Cabinet, console, and panel faces, including drawers shall be same color.

4.26 Wiring within console and cabinets shall be installed to conform to standard engineering practice, and shall be terminated on terminal strips having a terminal for each required external connection. Wiring shall be cabled, laced and securely fastened

in place so that no weight is imposed on any equipment, control switches or terminals.
Wires carrying

audio power shall be shielded. Input and output circuits and terminal strips shall be installed to provide separation necessary for proper operation. Wires shall be identified by number and chart.

4.27 Conductor shields for each system shall be grounded at one location only. Grounding shall be done within console and cabinet racks. There shall be no metallic connection between systems. Conduits for system and 120 volt AC system shall be bonded together at console and all cabinet racks.

4.28 120 Volt AC supply shall be connected from each piece of equipment directly to power strips provided by system supplier. The power strip shall be provided with a "SO" type power cord to connect to the building power receptacle.

4.29 Lines and cables within cabinets and on main terminal backboards shall be carefully cable-strapped. Cables shall be formed in rectangular configuration. Each cable shall be properly numbered in numerical order and shall maintain same number throughout site.

4.30 Conductors shall be color-coded and individual cables shall be rung out, and tagged with code wire markers. Each cable index strip shall be typed and installed on terminal cabinet door.

4.31 Terminations and connections throughout system shall be on terminal blocks, except at equipment which requires removal for servicing. Connections to such equipment and cables shall be screw-terminal type or plug-in type. Cables shall be identified as to buildings and rooms served, and terminated in all terminal cabinets and backboards.

4.32 Blocks shall be mounted in vertical rows only. Cable with lowest number shall be terminated on upper left side, with next cable in numerical order just below first cable and so on. When left side of first row of blocks is full, next cable in numerical order shall be terminated on the upper right side of first row of blocks, and so on.

4.33 Do not pass grouped cables in area that is to be used for jumpering. Cables shall enter blocks from top or bottom only, and shall not be in same area as jumper wires.

4.34 Contractor shall submit shop drawings to the Architect, for approval, indicating proposed wire tag designations for cables and terminal block layout for all terminal cabinets and backboard locations.

General Performance Requirements

4.35 Contractor shall compile all data needed (room names, room numbers, drawings with station locations, etc.) to program the complete system. System programming shall be limited to features specified in this Specification.

4.36 Reproduction of speech shall be clear, high fidelity, and with all frequencies within range of system faithfully reproduced with no detectable noise, hum, or distortion.

4.37 Reproduction shall be attained at sound levels sufficient to override noise levels typical for schools, to provide a thoroughly satisfactory and serviceable system.

4.38 Audio level of intercommunication system shall be attained at sound levels sufficient to override noise levels typical for schools, to provide a thoroughly satisfactory and serviceable system with a minimum of 70 dB isolation between public address and intercommunication signals. The contractor shall adjust the individual speaker taps at any location the district requires lower or higher sound levels

Inspection and Test upon Completion

4.39 Check out and final connections to the system shall be made by a factory-trained technician in the employ of a manufacturer of the products installed. In addition, factory-trained technicians shall demonstrate operation of the complete system and each major component to the Owner.

4.40 System field wiring diagrams shall be provided to the owner by the system manufacturer prior to completion of the installation.

4.41 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.

4.42 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.

4.43 Upon completion of the installation of the equipment, contractor shall provide to the owner a signed statement from the equipment manufacturer that the system has been tested and functions properly according to the specifications.

Operation and Training

4.44 Warranty service calls made by telephone to this contractor or his designated representative shall hereby be defined as proper notification that warranty service is required.

END OF SECTION

SECTION 28 01 00
ELECTRONIC SAFETY AND SECURITY
GENERAL PROVISIONS

PART 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

SECTION 28 13 00
SECURITY SYSTEM

PART 1 – GENERAL

- 1.1 Furnish all materials, equipment and labor, and perform all operations in connection with systems work as indicated on the drawing, as specified herein and required to complete the work.
- 1.2 Related Specification Sections:
 - Division 26 05 33 – Conduit and Fittings
 - Division 26 05 19 – Conductors
 - Division 26 05 34 – Outlet and Junction Boxes
- 1.3 All security system components shall be manufactured by and wiring shall be furnished and installed by a factory authorized contractor and distributor. The Contractor shall hold a license from the State of California for the purpose of installing security systems.
- 1.4 The contractor shall be regularly engaged in the installation and repair of the type of equipment to be installed.
- 1.5 The conduit, outlets, terminal cabinets, device backboxes, etc., which form a part of the rough-in work, shall be furnished and installed complete by the Contractor. Security system components as listed under products shall be furnished and installed by the authorized subcontractor.
- 1.6 The subcontractor shall furnish all equipment, accessories and material required for the complete installation of a security system in accordance with specifications and as shown on the drawings. Any material and/or equipment necessary for the proper operation of the system not specified or described herein shall be deemed part of this specification. The distributor must also provide complete installation of all wiring and devices or equipment. Supervised installation for the wiring and devices shall be permitted with the following conditions:
 - 1.6.1 A letter will be required from the security system manufacturer's representative certifying that the cable installation was completed in compliance with the manufacturer's recommended installation requirements.
 - 1.6.2 The cables shall be tested in the presence of the manufacturer's representative. These tests will then be submitted to the electrical engineer.

1.6.3 The security system shall be warranted by the manufacturer's representative per the contract agreement.

1.7 General Submittal Requirements

1.7.1 **Phase I Submittal** shall be made in electronic format within (20) working days after the award of the contract by the District. This submittal shall include the following:

1.7.1.1 Complete Bill of Materials in Excel Spreadsheet format with bills of quantities, including all materials, components, devices, and equipment required for the 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:

1.7.1.2 Description and quantity of each product.

1.7.1.3 Manufacturer's Name and Model Number.

1.7.1.4 Material Cut Sheets shall provide detailed product information and shall be original manufacturer product bulletins. Copies of material information from vendor websites shall not be considered equal and will not be accepted.

1.7.1.5 Material Cut Sheet part number provided shall be highlighted or provided with an arrow directed at the corresponding part number.

1.7.1.6 Specification Item Number referenced for each required product or if not shown in the specifications, Drawing Detail Number being referenced. (ie; Spec. 281300 Item 2.1 or DWG E4.15/#1)

1.7.1.7 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.

1.7.2 **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 in a CAD Software. Submission shall include electronic print copies to match the contract drawings, and Phase II submittals drawings shall include the following.

- 1.7.2.1 Complete floor plans showing the locations throughout the project of all receptacles, conduits, wireways, tray, pullboxes, junction boxes, equipment locations, and other devices.
 - 1.7.2.2 Typical system riser diagrams, specialty equipment or rack elevations will be required to be provided.
 - 1.7.2.3 The contractor shall provide as part of this contract additional ceiling motion sensors, wall motion sensors, security door and roof hatch contacts to equal 10% of the total quantity of devices shown on the drawings or a minimum of three (3) for each type, whichever is greater. Installation of conduit, boxes and wiring of these devices shall be included, and required locations coordinated with final approved shop drawings. 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.
- 1.7.3 Common submittal mistakes which will result in submittals being rejected:
- 1.7.3.1 Not including the qualifications of the installing Contractor Company and Contractor's Staff.
 - 1.7.3.2 Not including all items listed in the above itemized description.
 - 1.7.3.3 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 (provided for the project) or crossing out the items which are not applicable.
 - 1.7.3.4 Not including actual manufacturer's cut sheets or catalog information of proposed products.
 - 1.7.3.5 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.
- 1.7.4 The Contractor shall make a written request directly to Johnson Consulting Engineers for electronic drawing files (CAD). As a part of the written request, please include the following information:
- 1.7.4.1 Clearly indicate Project Name and Client, Johnson Consulting Job Number (located in bottom left corner of JCE Engineering Stamp) and each drawing Sheet Number required (i.e., E1.1, E2.1, E4.1 etc.).

- 1.7.4.2 Identify the name, Company, Title, phone number, mailing address and e-mail address of the person to receive the files.
- 1.7.4.3 Detail or Riser diagram sheets, System Schematic drawings or any other drawings other than floor plans or site plans, will not be made available to the Contractor.
- 1.7.4.4 Files will only be provided in the AutoCAD format in which they were created (i.e., version 2015 or version 2016). Files will not be made available in REVIT format.
- 1.7.4.5 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 and delays in requesting files will not alleviate the Contractor from submitting required documents within the required timeline.

PART 2 – PRODUCTS

Building Security System – Control Panel

- 2.1 Control Panel in the location shown in the specifications and the drawing details. The existing Security System on the campus is as manufactured by **Digital Monitoring Products (DMP)**.
- 2.2 The Control/Communicator panel shall be a multiplex micro processed based system as manufactured by **DMP Model XR500**. Provide Control Panel in IDF Cabinet IDF-‘R1’’. Control Panels shall be set up to act as an expansion panels for the existing Security System with the existing Main Security Control Panel in the **existing intercom/security system headend closet in 500 Building** serving as the Master Security Control Panel. Refer to the floor plans for the location of the panel.
- 2.3 The system must be able to provide the following minimum functions:
 - 2.3.1 Provide capacity for 574 individual zones.
 - 2.3.2 Up to 16 independent Access Control Door locations (Wiegand).
 - 2.3.3 Minimum capacity of (16) Supervised keypads from one control panel.
 - 2.3.4 Up to 500 wired or wireless LX Bus devices
 - 2.3.5 Fully supervised 10/100 Ethernet network and CDMA/HSPA+ cellular communications capabilities.
 - 2.3.5.1 Control Panel shall be provided with 10/100Mbps Ethernet Card Option

- 2.3.5.2 Provide 263LTE-FN FIRSTNET READY™ Cellular Communicator Option.
- 2.3.5.3 When using the 263LTE-FN with the XR150/XR550 Series Control Panels, provide a Model #381 cable for connection from the cell module SMA connector to the panel enclosure knockout.
- 2.3.6 Central Station reporting via ethernet connection (IP) and simultaneous digital dialer for multiple central station receivers.
- 2.3.7 Interface with the district central monitoring system to report all addressable devices individually (by site, building and room) and to be remotely programmable from the district central system for maintenance and changes to the system.
- 2.3.8 U.L. listed for Burglary and access control
- 2.3.9 Battery backup included
- 2.3.10 Capability to extend keypad or sensor wiring bus lengths to a minimum of 15,000 ft.
- 2.3.11 Systems or components as manufactured by Bosch, Honeywell, Radionics or any other manufacturer's which are not specifically listed in 2.1, are not approved for use on this project
- 2.4 Provide a complete and operable supervised intrusion detection system including, but not limited to; control panel, keypad stations, motion detectors, door contacts, zone expanders and repeaters and a digital communicator.
 - 2.4.1 The new Security Control Panels shall be tied in with the existing Main Security Control Panel in the 500 Building.
 - 2.4.2 Upon detection of an intruder by initiation of any device in the system, the system shall cause alarm information to be sent by (IP) to the district central station and by digital dialer to an independent alarm monitoring agency. Each motion sensor and or door contact shall have a distinct address and each address shall report to the monitoring agency including the site name, building name, and room number identifications associated with each device. The installing contractor must submit a list of all devices and their reporting identifications to the district for review and approval prior to any programming. Naming and room numbers must be consistent with actual facility identifications, which may vary from identifications included in the bid construction documents. An operational test of each installed system must be able to confirm compliance with the above requirements for each device installed, before the system will be considered complete and operational.

- 2.4.3 Coordinate with the District Facilities Department for integration with the existing campus security system for access to the Administrative Level software for system programming.
- 2.4.4 Upon detection of an intruder by any initiation device in the system, the system shall cause a prerecorded message to be played over the campus intercom system. The intercom system shall play the message over all INTERIOR only speakers. The message shall repeat (2) times "An unauthorized entry to the facility has been detected, authorities have been contacted "in both English and Spanish.
- 2.5 Systems shall detect the entry and/or the motion of a body taking not more than four steps in an area secured with motion detection equipment where entry doors or windows are possible access.
- 2.6 New Buildings shall be zoned and controlled separately and each sensor individually addressable so that portions of the facility may be secured while others remain unsecured. All zones for the New Buildings shall be able to be armed or disarmed from the new keypads where shown on the drawings.
- 2.7 New Control Panels shall be furnished with a new Category-6 Data Outlet by the 27 10 00 Contractor in the IDF Closets.
- 2.8 Existing Master Keypad location in the Administration Building. Program Keypad to add the additional Zones for Universal Arm/Disarm of the campus.
- 2.9 Provide Keypads as shown on the drawings.
 - 2.9.1 When staff arrives, they would present their code to the keypad. This would disarm the building in which the staff works, and the not armed indicator light at the annunciator will be triggered.
 - 2.9.2 When staff is leaving, (and presumably is the last one from their building leaving) they would press the "Command" button, then select "Arm", then select "All". The building would arm, and the armed indicator light at the annunciator will be triggered

Building Security System – System Devices

- 2.10 Provide the Security System Devices as shown on the project floor plans. Every type of device described below may or may not be shown on the floor plans.
- 2.11 Keypads - Keypads shall be alpha numeric LCD display series capable of displaying system status and controlling the alarm system. Unit shall receive its operating power from the control panel.
 - 2.11.1 All zones shall have the ability to be controlled by the existing Master Keypad located in the Administration Building.

- 2.11.2 Provide keypads at locations where on drawings for coverage of the zones as required by District. Each building or zone shall be furnished with a keypad, unless otherwise noted on the drawings or in these specifications. Provide two-line Alphanumeric 32-character LCD display keypad with two-button panic and four zones by DMP Model # 7073A Aqualite Series Keypads (No Approved Equal).
- 2.12 Motion Sensors - Motion sensors shall be passive infrared with microwave Doppler radar detection. Sensor coverage patterns shall be as required for optimum coverage at each individual location. Sensor shall be wall mounted at the locations as shown on the drawings.
- 2.12.1 Wall Mounted Motion Sensors – Large Rooms – DMP Model #Optex DX-60 Plus (No Approved Equal). Dual Tech PIR and Microwave wall mounted sensor with a minimum coverage pattern capability of 60-feet by 60-feet. Larger non-classroom spaces shall also be provided with this model of sensor.
- 2.12.2 Wall Mounted Motion Sensors – Classrooms – Offices, Workrooms or other similar smaller rooms - DMP Model #Optex DX-40 Plus (No Approved Equal). Dual Tech PIR and Microwave wall mounted sensor with a minimum coverage pattern capability of 40-feet by 40-feet.
- 2.12.3 Contractor shall furnish and install the wall mount brackets for the wall mounted motion sensors by DMP Optex Model #FA-1W or Model #FA-3 (No Approved Equal). Type of bracket provided shall be based on desired coverage for the sensor.
- 2.12.4 Ceiling Mounted Motion Sensors in Rooms with Accessible Ceilings – DMP Model #Optex FX-360 (No Approved Equal). Rooms with accessible ceiling, between 8-12 feet in height, shown with ceiling mounted sensors shown on the floor plans, shall be furnished with a PIR Technology ceiling mounted sensor with a minimum coverage pattern capability of 25-feet to 40-feet in diameter.
- 2.13 Door Contacts – Door contacts shall be provided at all exterior doors and at all roof hatches. Contractor shall refer to the drawings for the locations of the doors and roof hatches. In addition, all roll-up type garage doors or security shutters shall be provided with door contacts.
- 2.13.1 Door contacts for standard doors at drywall walls or accessible walls shall be installed as recessed contacts. Provide DMP Model #1076C Magnetic Terminal Contacts (No Approved Equal).
- 2.13.2 Door contacts for standard doors at concrete or CMU walls or non-accessible walls shall be installed as surface mounted contacts. Provide DMP Model #Sentrol 1085TW Magnetic Wide Gap Terminal Contacts (No Approved Equal).

- 2.13.3 Door contacts for Store Front glass doors shall be installed as miniature size recessed contacts. Provide DMP Model #STB-10 Magnetic Terminal Contacts (No Approved Equal).
- 2.13.4 Door contacts for overhead roll-up garage doors or security shutters shall be surface mounted heavy-duty, industrial wide gap type with 36" armored cable by DMP Model #Sentrol 2505A Magnetic Terminal Contacts (No Approved Equal).
- 2.13.5 Door contacts must be installed using the screws and the adhesive contact sheet provided with the door contact or with the screws alone. Installation using the adhesive contact sheet alone is not allowed.
- 2.13.6 Cable splice connections for the armored cable provided with overhead roll-up garage door contacts shall be provided inside a dual gang junction box in an accessible location for future maintenance. The junction box shall be provided with a blank cover labeled with a permanent type-written label showing the unique device number and any zone information or door number.

Building Security System – System Cable

- 2.14 Wire and Cable - Cabling shall be as required for system operation or as shown in the specifications and detail drawings. Refer to the floor plans for additional requirements.
 - 2.14.1 Interior Riser Rated Keypad Cable - Provide (4) conductor, 18-AWG, Polypropylene coated stranded bare copper conductors with PVC jacketed, Riser-rated cable for keypad locations within a building. Provide Honeywell Part #2115 or West Penn Part #244.
 - 2.14.2 Exterior Water-Blocking Rated Keypad Cable - Provide (4) conductor, 18-AWG, stranded bare copper conductors with PVC jacketed, Outdoor-rated, direct burial type cable for keypad locations between buildings. Cable shall be used for all exterior cable runs. Provide Honeywell Part #4157 or West Penn Part #AQ244.
 - 2.14.3 Exterior Water-Blocking Rated Trunk Cable - Provide Unshielded (8) conductor, 18-AWG, stranded bare copper conductors with PVC jacketed, Indoor/Outdoor-rated, Wet Location Water Blocking Tape type cable for Security Trunk between the Main Control Panel and Secondary Security Panels. Cable shall be used for all exterior Trunk Cable runs. Provide West Penn Part #AQC188 (or Equal by Honeywell)
 - 2.14.4 Interior Riser Rated Motion Detector Cable - Provide (4) conductor, 22-AWG, Polypropylene coated stranded bare copper conductors with PVC jacketed, Riser-rated cable for motion detector locations within a building. Provide Honeywell Part #2104 or West Penn Part #241.

- 2.14.5 Interior Riser Rated Door Contact Cable - Provide (2) conductor, 22-AWG, Polypropylene coated stranded bare copper conductors with PVC jacketed, Riser-rated cable for door contact locations within a building. Provide Honeywell Part #2102 or West Penn Part #221.
 - 2.14.6 All cables shall be permanently labeled with a permanent type-written label showing a unique cable number a minimum of two locations, one within 6" and one 24" from the point of termination at the end of the cable.
- 2.15 Provide other items as shown in the drawings or specifications.

PART 3 – EXECUTION

- 3.1 All connections throughout the system shall be soldered, crimped by means of AMP lugs, fastened with screw type terminals, made by spring tension clip "punch block" terminals or made by standard plugs and receptacles. All conductors in terminal cabinets shall be neatly routed and dressed with Velcro style cable ties in a workmanlike manner. The cable ties shall not cover any labeling at the ends of the cables.
- 3.2 All security system cabling shall be installed in conduit where indicated on the drawings or where routed exposed and shall be open wiring where routed above accessible ceilings or in walls.
- 3.3 Locate motion sensors on walls to provide optimum coverage of the space and to not conflict with the architectural aesthetics of the building. Locations of motion sensors as shown on the electrical plans are diagrammatic only.
- 3.4 Keypads shall be wired not to exceed 1000 ft cable run from the main control panel and no more than two (2) keypads per 1000-foot cable run. Provide #18AWG minimum. **All Cables routed underground shall be suitable for wet location provided with UL listed wet location insulation or flooded type cable construction.**
- 3.5 All wet location cables routed through handholes or manholes shall be provided with a service loop inside the handhole or manhole. The cable shall be provided with a minimum of one entire loop around the inside of the perimeter of the handhole.
- 3.6 Pull strings shall be provided with all cable runs including but not limited to; conduit stub ups, conduit sleeves, cable trays, open wiring routes 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 for the exterior site conduits.
- 3.7 Velcro cable management straps are required on all Security System 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 to the Security System backboard location shown on the floor plans.
- 3.8 The 28 13 00 Contractor shall supply protective bushings or slide on rings at the ends of all exposed conduits used for the security system cabling. This is to include all conduits

installed for any future data cabling requirements. Contractor shall submit planned protection bushings prior to installation of cabling for approval.

- 3.9 Where open wiring cables are run through the ceiling space the wire shall be bundled together and supported above the ceiling.
- 3.10 The 28 13 00 Contractor may not use the cable suspension system installed by the 27 10 00 Contractor (for data cabling) for the security cabling. The 28 13 00 Contractor shall furnish and install a separate suspension system for the security system cabling.
 - 3.10.1 All cables must be fastened to the building structure via “j-hooks” or an approved suspension system, and not directly in contact with ceiling system. For “j-hooks” follow the maximum fill capacity as recommended by the manufacturer based on the outside diameter of the security cables. For large quantities of cables, use a sling support system such as “Erico Cable Cat” or equal. 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.
 - 3.11.1 The 28 13 00 Contractor shall coordinate with the 27 10 00 Contractor, 27 20 00 Contractor, 28 23 00 Contractor and any other Low Voltage Contractor working on the project, for use of the sleeve penetrations shown on the drawings.
 - 3.11.2 The 28 13 00 Contractor shall be responsible for replacing the fire-stopping materials on any sleeve penetration used that was previously sealed. The firestopping material used for the replacement must match the existing materials.
 - 3.11.3 If there are no existing conduit sleeves through the rated walls that must be penetrated, the 28 13 00 Contractor shall be responsible for providing the conduit sleeve and the fire-stopping materials as shown in the drawing details.
 - 3.11.4 Expanding foam is not an acceptable sealant for any conduit opening. Contractor shall be responsible for complete replacement of the conduit and cabling in any conduit filled with expanding foam used as a sealant.
- 3.12 The minimum bending radius for all cables and the maximum pulling tension shall not exceed manufacturer's recommendations.
- 3.13 Provide a full 360-degree loop of slack cable around pullbox interiors. Cables entering pullboxes from the bottom, shall not be allowed to touch the bottom of the cover when closed and shall not be pinched or crushed in any way.

- 3.14 When pulled through conduits, cable pulling lubricants shall be continuously applied to all cables and be specifically approved by the manufacturer.
- 3.15 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.
- 3.16 A pull string shall be placed with all security device cables at the time of installation. Conduit runs and surface raceway for station cabling shall be furnished with a minimum 2-Ply spiral wrap style, pull string rated for 240 ft/lbs. pulling strength, such as manufactured by Greenlee #431 or approved equal. Includes all conduit stubs and cables routed through open ceilings and cable trays. Pull strings shall be tied off in the junction box and in the ceiling. Provision for the installation of the pull string shall apply to all empty and spare conduits as well. Single ply type pull string will not be accepted as a substitute for the 2-ply pull string.
- 3.17 A measuring pull tape shall be placed with all OSP-Rated Site Security cables at the time of installation. Outdoor conduit runs between buildings designated for feed cabling, in excess of 150 feet shall be provided with a minimum ½" polyaramid style, measuring true tape pull string annotated with footage increments rated for 2500 ft/lbs. pulling strength, such as manufactured by Greenlee #39245 or approved equal. Conduit runs less than 150 feet shall be furnished with a ¼" polyaramid style, measuring true tape pull string annotated with footage increments rated for 1250 ft/lbs. pulling strength, such as manufactured by Greenlee #39243 or approved equal. Provision for the installation of the measuring pull tape shall apply to all empty and spare conduits as well. Standard twine style pull strings and standard nylon or polypropylene style pull ropes will not be accepted as a substitute for the polyaramid measuring tape type pull string.
- 3.18 All cables shall be new and extend continuous from each MDF Closet Security backboard or IDF Closet Security backboard to all outlet locations.
- 3.19 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.
- 3.20 Labeling
- 3.20.1 Each cable run shall be permanently labeled at each end with a unique sequential number which corresponds to a similar number provided for each security device. A printed label shall be placed at each of the following locations;
- 3.20.1.1 On the cable at the point of termination 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).

- 3.20.1.2 On each cable in the j-box behind the device location or on the cable before the point of termination at the device, for devices without a j-box. 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).
 - 3.20.1.3 On the cable at the terminal strip or pop-it prior to termination point. 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).
 - 3.20.1.4 The label shall be clearly defined with a minimum #10 font size.
- 3.20.2 Hand written labels are not permitted. Where cable ID includes room number identification, the Contractor shall obtain written verification of final room numbers prior to beginning labeling (numbers on plans do not always match final room numbers). Cable pulling cross reference lists will not be accepted with final documentation.
- 3.20.3 Labeling will follow recommended identification standards or District Standards as directed by the customer. Contractor will confirm labeling pattern prior to final identification or testing. All device identification designations shall match the final identification information shown on the Final As-Built Drawings. Contractor shall be required to have the labeling scheme approved in writing by the District Facilities Director prior to manufacture or installation of the labeling.
- 3.20.4 All OSP-rated cables routed through underground conduits shall be tagged with waterproof label tags in every manhole or pullbox. Waterproof label tags shall also be placed at each end of the cable in the termination closets or terminal cabinets in clear view at the point where the conduit transitions up out of the slab or where the conduit enters the terminal cabinet. A minimum of (2) tags are required in each handhole or manhole.
- 3.20.5 Refer to detail drawings for additional labeling requirements
- 3.21 Final System Acceptance
 - 3.21.1 The system will be accepted only after a satisfactory test of the entire system has been accomplished by a Factory-Trained Contractor in the presence of the Owner's Representative. This contractor shall provide all personnel, ladders and testing equipment to assist in completing this test. Actuate each device and verify that the system performs as specified.
 - 3.21.2 Once the system has been tested, the contract shall not be considered complete until after District training has been completed. The Contractor shall notify in writing their intent to provide the training for the system. This notification shall be given to the Architect and the Project Engineer a

minimum of two weeks prior to the scheduled training session. The 28 13 00 Contractor shall be responsible for notifying the District to confirm that the appropriate District personnel will be made available for this training session. If the District does not receive confirmation that the training session can be performed on the proposed date, than another time shall be provided. The training shall consist of the following:

3.21.2.1 Provide a minimum of one (1) two-to-four-hour training period located at the project site, to instruct District personnel in proper operation of all systems.

PART 4 – CLOSE-OUT DOCUMENTATION

4.1 Final As-Built Drawing Submittals - Provide (1) hard bound copy of “E-size” As-Built drawings and (3) copies on USB Flash Drive in AutoCAD (2019 or newer version) format. A Hand marked-up copy of the original construction drawings will not be accepted as the final As-Built drawing submittal. Final As-Built drawings shall include copies of the floor plan drawings of each building, detailed elevations of each MDF or IDF locating all equipment, quantities devices and locations, locations of all sleeves and identification of all final cable routes. In addition, the drawings shall include all device locations with unique cable identification numbers.

END OF SECTION

SECTION 28 30 01
FIRE ALARM VOICE EVACUATION SYSTEM

PART 1 – GENERAL

- 1.1 Work Included:
 - 1.1.1 Furnish and install all equipment, accessories, and materials in accordance with these specifications and drawings to provide a complete and operating fire alarm system.
- 1.2 Related Work:
 - 1.2.1 Division 26 01 00: Electrical General Provisions
 - 1.2.2 Division 26 05 33: Conduit and Fittings
 - 1.2.3 Division 26 05 34: Outlet and Junction Boxes
- 1.3 The equipment and installation shall comply with the current applicable provisions of the following standards:
 - NFPA 72-2022. National Fire Alarm Code with California Amendments.
 - CBC - 2022. California Building Code (CBC), Part 2, Title 24, CCR.
 - CEC - 2022. California Electrical Code, (CEC), Part 3, Title 24, CCR.
 - CFC - 2022 California Fire Code (CFC), Part 9, Title 24, CCR.
- 1.4 The system and all components shall be listed by Underwriters Laboratories, Inc. for use in Fire Protective Signaling Systems under the following standards as applicable:
 - UL 38 Manually Actuated Signaling Boxes.
 - UL 50 Cabinets and Boxes.
 - UL 268 Smoke Detectors for Fire Protective Signaling Systems.
 - UL 268A Smoke Detectors for Duct Applications
 - UL 346 Waterflow Indicators for Fire Protective Signaling Systems.
 - UL 464 Audible Signaling Appliances.
 - UL 521. Heat Detectors for Fire Protective Signaling Systems.
 - UL 864 Control Units for Fire Protective Signaling Systems.
 - UL 1481. Power supplies for Fire Protective Signaling Systems.
 - UL 1971. Visual Signaling Appliances.
- 1.5 Only Fire Alarm Control Panel Equipment and Peripheral Field Devices have been shown on the Contract Bid Single Line Block Diagram. Specific and complete wiring between Control Equipment and Peripheral Equipment has been deleted for clarity.
- 1.6 Fire Alarm system and installation shall meet all of the following DSA Requirements:
 - 1.6.1 Applicable Standard NFPA 72, as adopted and amended in CBC Chapter 35

- 1.6.2 Installation of the systems shall not be started until detailed design documents and specification, including state fire marshal listing numbers for each component of the system, has been approved by DSA.
- 1.6.3 Upon completion of the system installation, a satisfactory test of the entire system shall be made in the presence of a DSA project inspector.
- 1.6.4 A stamped set of approved fire alarm design documents shall be on the job site and used for installation.
- 1.6.5 Any discrepancies between the drawings and the code or recognized standards shall be brought to the attention of DSA and the architect/engineer of the project.
- 1.6.6 DSA, architect/engineer and owner shall be notified a minimum of 48 hours prior to the final inspection and/or testing.
- 1.6.7 All penetrations through rated assemblies requiring opening protection shall be provided with a penetration fire stop system as identified in CBC Chapter 7, UL or other approved lab testing criteria. Approved types of materials shall be identified within the project specifications within the fire alarm section.
- 1.6.8 Wall mounted visible notification devices shall have their bottoms mounted at 80" minimum and 96" maximum from finished floor.
- 1.6.9 Wall mounted Audible devices shall have their tops mounted at 90" maximum from finished floor.
- 1.6.10 Audible devices shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or five dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, in every occupiable space within the building.
- 1.6.11 Audible devices shall be synchronized temporal code 3 pattern.
- 1.6.12 The contractor shall adjust/install all devices to maximize performance and minimize false alarms.
- 1.6.13 Visible devices shall not exceed two flashes per second and should not be slower than one flash every second. The device shall have a pulsing light source not less than 15 candela. Visible devices from each other shall be synchronized.
- 1.6.14 Underground and exterior conduits to have watertight fittings and wire to be approved for wet locations.
- 1.6.15 All fire alarm wiring shall be FPLOR FPLP (fire power limited or fire power limited plenum) as required for application. Wiring in conduit above grade may be type THHN or THWN.

- 1.6.16 Per CEC standards, all wiring is to be pulled through each junction box and connected directly to each fire device. Do not splice the wire. All boxes to be sized per CEC.
- 1.6.17 Smoke detectors shall not be any closer than 1' from fire sprinklers or 3' from any supply diffuser. In area of construction or possible damage/contamination on newly installed fire alarm, devices shall be covered until that area is ready to be turned over to owner.
- 1.6.18 All fire alarm circuits shall be in conduit, surface raceway or open run above ceilings, under floors and in walls in a neat and protected manor as indicated on design documents. Exposed circuits are only permitted when noted as exposed on design documents.
- 1.6.19 Fire alarm panel, remotes, and components shall be secured to mounting surfaces per manufacturers specifications. No single device shall exceed 20 lbs without special mounting details.
- 1.6.20 A dedicated branch circuit shall be provided for fire alarm equipment. This circuit shall be energized from the common use area panel and shall have no other outlets. The breaker shall have a red locking device to block the handle in the "on" position. The circuit breaker shall be labeled "Fire Alarm Circuit Control" Circuit ID to be labeled at fire alarm panel/extendors.
- 1.6.21 The installing contractor shall provide a completed "System Record of Completion" per NFPA 72, figure 17.8.2.
- 1.6.22 Fire alarm control panels and remote annunciators shall be installed with their bottoms mounted at 48" above the finished floor.
- 1.6.23 Microphones associated with emergency voice alarm communication systems (EVAC) shall be accessible for use. Installed in compliance with CBC sections 11B-305 and 11B-308.
- 1.6.24 The installing contractor shall provide system programming for supervisory monitoring per CBC section 901.6.2.
- 1.6.25 Supervisory monitoring shall be tested and verified as sending correct signals in conjunction with final acceptance test.
- 1.6.26 Owner shall be responsible for establishing a fire system monitoring contract or provisions.
- 1.7 Submittal shall be made **in accordance with Division 26 01 00 – Shop Drawings and Submittals**. This submittal shall include the following:
 - 1.7.1 Complete bills of quantities, including all materials, components, devices, wiring 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:

- 1.7.1.1 Quantity of each type of equipment item.
- 1.7.1.2 Quantities of 10% spare devices as per 1.16.
- 1.7.1.3 Description of each item.
- 1.7.1.4 Manufacturer's Name and Model Number.
- 1.7.1.5 Manufacturer's Specification Sheet.
- 1.7.1.6 Back box type and dimensions per device type.
- 1.7.1.7 California State Fire Marshall Listing Sheets for all components.
- 1.7.1.8 Equipment items which have individual components, will require that all component parts be listed individually.
- 1.7.1.9 Letter indicating the contractor's intent to comply with Phase II submittal drawings.

1.8 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 one (1) data disk copy with files in an AutoCAD 2000i or 2004 format. Building floor plan CAD files on disk, will be made available via express mail after the receipt of payment of \$50.00 per building floor plan, or \$300.00 minimum which ever is less. 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.

1.8.1 Provide complete shop drawings to include the following:

- 1.8.1.1 Complete floor plans, at scale of contract documents, showing the locations throughout the project of all devices, panels, conduits, wireways, tray, pullboxes, junction boxes, number and type of conductors, remote indicators, annunciators, remote test stations, end of line and power supervisory devices and other devices.
- 1.8.1.2 Point to point wiring diagrams showing wiring from panel terminals to each device.
- 1.8.1.3 Riser diagram indicating all wiring and circuits.
- 1.8.1.4 Current State Fire Marshal listing sheets for all components and devices.
- 1.8.1.5 Provide battery power supply calculations, indicate point of power supply connection, means of disconnect, over-current protection, etc. for each panel.

- 1.8.1.6 Provide detailed information on conductors to be used-
manufacturer, type, size, insulation, etc.
- 1.8.1.7 Provide voltage drop calculations for all conductor run is from each
panel (i.e., main FACP, remotes, power extenders, etc.) for each
panel.
- 1.8.1.8 Provide written sequence of system operation matrix.
- 1.8.1.9 Provide list of zones. (Every device that is addressable.)
- 1.8.1.10 Provide detailed drawing for annunciator panel indicating all zones
and initiating devices.

1.9 **Common submittal mistakes which will result in submittals being rejected:**

- 1.9.1 Not including the qualifications of the installing contractor.
- 1.9.2 Not including all items listed in the above itemized description.
- 1.9.3 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.
- 1.9.4 Not including actual manufacturer's catalog information of proposed products.
- 1.9.5 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.
- 1.10 All equipment and material shall be new and unused, and listed by Underwriter's
Laboratories for the specific intended purpose. All control panel components and field
peripherals shall be designed for continuous duty without degradation of function or
performance. All equipment covered by this specification or noted on Installation.
Drawings shall be equipment suited for the application and shall be provided by a single
manufacturer or be recognized and UL listed as compatible by both manufacturers.
- 1.11 It will be the responsibility of the Contractor to ensure proper specification adherence
for system operation, final connection, test, turnover, warranty compliance, and after-
market service. The distributor of the equipment specified must be factory-trained and
certified.
- 1.12 Basic System Functional Operation, upon operation of any automatic, manual or other
initiation device the following shall occur:
 - 1.12.1 The system alarm LED shall flash.
 - 1.12.2 A local piezo electric signal in the control panel shall sound.

- 1.12.3 A backlit 80-character LCD display shall indicate all information associated with the fire alarm condition, including the alarm point and its location within the protected premises.
- 1.12.4 History storage equipment shall log the information associated with each new fire alarm control panel condition, along with time and date of occurrence.
- 1.12.5 All system output programs assigned via control by event equations to be activated by the particular point in alarm shall be executed, and the associated system outputs (alarm notification appliances and/or relays) shall be activated.
- 1.12.6 LED display and audible signaling at the remote annunciator indicating building, fire zone, and type of device. Annunciator shall also provide a separate audible signal for CO detection with a green flashing light, with classroom number indication.
- 1.12.7 Automatic retransmission to a UL central station for fire department notification.
- 1.12.8 Automatic shut down of air conditioning units shall be performed by control modules at each unit when required as part of a complete area coverage design scheme. Each building shall shut down all A/C units and dampers within that building as one zone.
- 1.13 All equipment and components shall be new, and the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approval agency for use as part of a protective signaling system.
- 1.14 All equipment and components shall be installed in strict compliance with manufacturer's recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.
- 1.15 All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place. Fasteners and supports shall be adequate to support the required load.
- 1.16 All wiring shall be installed in a conduit system and shall be Class A.
- 1.17 The contractor shall provide as a part of this contract additional control modules, heat detectors, smoke detectors, CO detector, duct detectors, manual pull stations, strobes, speakers, speaker/strobes exterior speakers devices etc. along with all required programming, to equal 10% of the total quantity of devices shown on the drawings, or a minimum of three (3) for each type, whichever is greater. Installation of 50' of conduit, boxes and all wiring for each of the devices shall be included, and required locations coordinated with CSFM final approved shop drawings. 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 I submittals.

- 1.18 The installing contractor shall provide a copy of current documentation, indicating that the contractor installing the fire alarm systems or devices and wiring, is certified by Underwriters Laboratories (UL) in its product directories under the listing category "PROTECTIVE SIGNALING SERVICES - LOCAL, AUXILIARY, REMOTE STATION, AND PROPRIETARY." The contractor shall be certified by the manufacturer to install and program the system. The contractor must also provide complete installation of all wiring and equipment, and software programming. Supervised installation of the wiring, devices and/or any software programming shall not be permitted.
- 1.18.1 The installing contractor must also be an "authorized dealer" by the equipment manufacturer, and must have completed all required training prior to the bid of this project.
- 1.18.2 The fire alarm system installation shall be warranted by the manufacturer's representative.
- 1.18.3 The Contractor shall have a current California C-10 or C-7 Contractor's License, and all individuals working on this project shall have passed the Department of Industrial Relations Division of Apprenticeship Standards – "Fire / Life Safety Certification Program."
- 1.18.4 The installing contractor shall provide, at the time of submittal, a letter of intent to provide an extended service warranty. This warranty shall extend for a total of three (3) years, starting at the completion, testing, and training of this project. The service warranty shall cover all material and labor to keep operational all system devices installed under this project, and shall include two (2) complete U.L. system's tests and cleaning of all devices at year two (2) and year three (3) of the warranty. Routine cleaning of devices, other than at the two (2) specified U.L. system's testing periods, will not be included as a part of this warranty.
- 1.18.5 The installing contractor shall provide, at the time of submittal, a letter indicating that the installation crew for this project meets the following NICET certifications:
- 1.18.5.1 25% of the installing field personnel must have completed NICET Level 2 Certification.
- 1.18.5.2 One of the installing field personnel and /or supervisor must have completed NICET Level 3 Certification.
- 1.18.5.3 Contractor shop drawings shall be signed by an individual who has completed NICET Level 4 Certification.
- 1.19 All conduit and standard backboxes will be furnished and installed by the Division 26 Contractor. Specialty boxes will be furnished by the equipment supplier to be installed by the Division 26 Contractor.

- 1.20 Equipment and materials shall be the standard product of **FCI** to match the existing system
- 1.21 Alternate equipment as manufactured by any other manufacturer not specifically listed above will not be approved for use on this project.
- 1.22 D.S.A approved drawings are included as a part of the drawing set.

PART 2 - PRODUCTS

- 2.1 Main Fire Alarm Control Panel:
 - 2.1.1 Fire alarm control panel shall be FCI E3 and provide Voice Evacuation.
 - 2.1.2 The system shall be controlled and supervised by a microprocessor based monitoring fire alarm control panel. The systems shall be addressable, field configurable, programmable and editable. The system shall continuously scan devices for change of status. Each device shall have its own unique address, but shall also be grouped by building as a separate zone for remote annunciation and alarm report purposes.
 - 2.1.3 The fire alarm control panel shall be housed in a lockable, code gauge steel cabinet with 80character LCD display, master controller operators panel, indicating lamps, silence switch and reset switch mounted on cabinet front. The fire alarm control panel shall be physically and visually located in the general office for monitoring by staff, and shall sound the "Voice Message" in all zones. Signal duration shall be field programmable and initially set at three minutes. Provide all control modules, synchronous modules, etc., to provide a complete working system per all codes that apply.
 - 2.1.4 The fire alarm control panel shall come with standardized software for on-site customization of the system. The unit shall be capable of providing a 600-event historical log with zone or point selectable alarm verification.
 - 2.1.5 Provide a minimum 100 watts of amplification in each FACP with a minimum of 25% spare capacity.
 - 2.1.6 The unit shall support a minimum of 3000 intelligent addressable points and one output point, SPST contact per zone. Provide the number of modules necessary to control and supervise fire alarm devices as shown on the Drawings, as well as to provide 25% spare capacity.
 - 2.1.7 The unit shall also provide a minimum of (2) class B strobe circuits with additional circuits as indicated on the drawings.
 - 2.1.8 The fire alarm control panel shall be capable of providing a walk test.

- 2.2 The power feed for the FACP shall be 3-wire, 120volt, AC, single phase (20A circuit) permanently labeled "FIRE ALARM CONTROL POWER", terminating at the master fire alarm control and supervisory panel. The label shall be red with 1/4" high white lettering. The source circuit breaker must be provided with a lock-on device.
- 2.3 In addition to the AC circuit, the panel shall be equipped with a DC battery to activate an audible alarm and pilot light in case of a power failure on the AC circuit.
- 2.4 The master fire alarm panel shall be equipped with a manual pull lever type, supervised report station.
- 2.5 With the exception of the manually operated report station required at the master fire alarm panel and large assembly areas, the remainder of the school facility shall be equipped with approved, electronically supervised, automatic fire detection devices, such that every room, space, including concealed spaces, such as the attic spaces above ceilings, etc., is provided with approved coverage.
- 2.6 TRANSPONDER PANELS shall provide voice evacuation/annunciation with a minimum 100 watts of audio amplification to support 70v speaker devices and a minimum of (2) Class B Strobe NAC circuits and be fiber networked to the system. Provide for 25% additional capacity for amplification in each Transponder panel.
- 2.7 REMOTE POWER SUPPLIES shall provide a minimum of (4) Class B NAC circuits.
 - 2.7.1 Remote Power Supplies shall be provided adjacent to each Fire Alarm Control Panel that is incapable of supporting NAC strobe circuit(s). Refer to Fire Alarm Riser Diagram for quantity of strobe circuits required at each of these Fire Alarm Control Panels and provide additional Remote Power Supplies as required.
- 2.8 SPEAKER / STROBE DEVICE shall be of the semi-flush type designed for mounting to a standard 4 11/16" deep electrical back box. Each device shall be provided with a semi-flush accessory plate. Exterior speakers shall be weatherproof. The strobe unit shall have a meantime between failure (MTBF) of 1,000 hours or greater. The strobe section shall have a minimum flash rate of approximately one flash per second, with candela rating as per UL standard 1971. Housing shall be white.
 - 2.8.1 In areas containing two or more audible devices, or two or more visual devices, these devices shall be synchronized, Per NFPA 72, Chapter 18 California Amendments (2022).
- 2.9 STROBES. The strobe unit shall have a meantime between failure (MTBF) of 1,000 hours or greater. The strobe section shall have a minimum flash rate of approximately one flash per second, with candela rating as per UL standard 1971. Housing shall be white.
 - 2.9.1 In areas containing two or more audible devices, or two or more visual devices, these devices shall be synchronized, per NFPA 72, Chapter 18 California Amendments (2022).

- 2.9.2 Maximum pulse duration to be 0.20 of a second with an ADAAG 4.28.3(3). Visual alarms maximum duty cycle of 40%.
- 2.9.3 Capable of providing minimum candela. Intensity as shown on plans (effective strength measured at the source).
- 2.9.4 The flash rate to be a minimum of 1 Hz and a maximum of 2 Hz per NFPA 18.5.3.1.
- 2.10 HEAT DETECTOR DEVICES shall be analog addressable, fixed temperature x rate of rise, fixed at 200°F and a 15°F/min rate of rise. In janitor rooms equipped with kilns, devices shall be fixed at 200°F.
- 2.11 SMOKE DETECTOR DEVICES shall be analog addressable, photo-electric.
- 2.12 DIGITAL ALARM COMMUNICATOR TRANSMITTER. The control panel shall meet the requirements of UL 864 for central station connections, and shall be UL listed for use with the fire alarm control panel. The communicator shall be connected to supervise two telephone lines, all wiring required for this connection shall be provided by the fire alarm contractor Coordinate interface with District monitoring company as required.
- 2.13 REMOTE ANNUNCIATOR shall be an 80 character backlit, alphanumeric, LCD readout display. The display shall include alarm, supervisory, CO detection and trouble condition LEDs and tone alert. Each condition shall have a dedicated acknowledge push button switch to silence the local tone alert but leaves the LED lights on until all conditions have been restored.

PART 3 - EXECUTION

- 3.1 All wiring shall be (min) #18 AWG copper or as noted on drawings. All underground conductors shall be UL wet location rated for use in wet locations, West Penn "Aquaseal" or equal. There shall be no splices in underground handholes or vaults. A multi-conductor cable rated for use in wet locations will also be acceptable. It must be labeled "FIRE ALARM" in all pull boxes, using a water-tight labeling system.
- 3.2 Interior, dry location wiring for low voltage initiating circuits shall be #18 AWG copper, twisted shielded pair minimum, signaling circuits shall be No. 14 AWG minimum, and wiring for 120 volt circuits shall be No. 12 AWG minimum. All wiring shall be color coded, solid copper conductor. Use of power limited cable shall be restricted to controls listed for this purpose. Single conductors shall be type THHN/THWN-2 insulated copper.
- 3.3 Wire markers shall be provided for each wire connected to equipment. The marker shall be of the taped bank type, of permanent material, and shall be suitable and permanently stamped with the proper identification. The markers shall be attached in a manner that will not permit accidental detachment. Changing of wire colors within circuits shall be unacceptable.

- 3.4 A terminal cabinet shall be installed in the electric room for the fire alarm systems at each building. All fire alarm wiring shall terminate on UL approved strips in this terminal cabinet. All wiring shall be labeled at each termination strip. Wiring shall be configured such that all end-of-line resistors will be installed at the terminal cabinet.
- 3.5 Fire Sprinkler Activation detecting System(s) shall each be indicated on a separate zone in the fire alarm control panel.
- 3.6 Fire Alarm Control Panel and all other equipment shall be mounted with the center of all operable reset buttons, located a maximum of 48" front approach / 54" side approach above floor level.
- 3.7 Contractor shall provide complete wiring between all equipment.
- 3.8 The Fire Alarm/Life Safety Installation shall comply fully with all Local, State and National Codes, and the Local Authority Having Jurisdiction (AHJ) DSA.
- 3.9 The Fire Alarm Control Panel and power supply shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled with red marking at the Panelboard as FIRE ALARM CIRCUIT.
- 3.10 The Control Panel Cabinet shall be grounded securely to a power system ground conductor. Provide a 1/2-inch conduit and 1#12 grounding conductor to the building electrical service ground bus.
- 3.11 Conduit shall enter into the Fire Alarm Control Panel back box only at those areas of the back box which have factory conduit knockouts.
- 3.12 All field wiring shall be completely supervised. In the event of a primary power failure, disconnected standby battery, removal of any internal modules, or any open circuits in the field wiring; an audible and visual trouble signal will be activated until the system and its associated field wiring are restored to normal condition.
- 3.13 All cables and wiring shall be listed for Fire Alarm/Life Safety use, and shall be of the type as required by and installed per CEC Article 760.
- 3.14 Final System Acceptance
 - 3.14.1 Provide an NFPA Certificate of Compliance to DSA and the engineer of record. Complete fire alarm system shall comply with Chapter 14 of NFPA for testing and inspection and be sound-tested for audibility in all spaces requiring voice evacuation. This testing shall be performed in the presence of the project inspector, architect and district personnel. Adjust speaker taps or provide additional speakers as required to provide correct audibility.
 - 3.14.2 Beam detectors shall be tested by two methods:
 - 3.14.2.1 Manual slow cover test to confirm reflector alignment is correct.

3.14.2.2 Software fire test per UL268.5 to demonstrate when signal level is reduced simulating obstruction the detector will go into alarm.

3.14.3 The system will be accepted only after a satisfactory test of the entire system has been accomplished by a Factory-Trained Distributor in the presence of a representative of the authority having jurisdiction and the Owner's representative. This contractor shall provide all personnel, ladders and testing equipment to assist the local authority in completing this test. Actuate each device and verify that the system performs as specified.

3.14.4 The Contractor will present a complete set of "as-built" Fire Alarm/Life Safety system drawings, and the factory supplied Operator's Manuals as required by the General Provisions section of this specification.

3.14.5 Once the system has been tested and the certificate of compliance completed, the contract shall not be considered complete until after owner training has been completed. The contractor shall notify in writing their intent to provide the training for the system. This notification shall be given to the Division 21 Contractor, Architect and the Project Engineer a minimum of 2 weeks prior to the scheduled training session. The Division 21 Contractor and/or the architect shall be responsible for notifying the owner to confirm that the appropriate District personnel will be made available for this training session. If the Division 21 Contractor does not receive confirmation that the training session can be performed on the proposed date, then another time shall be provided. The training shall consist of the following:

3.14.5.1 Provide a minimum of one (1) four-to-six -hour training period located at the project site, to instruct District personnel in proper operation of all systems.

3.14.5.2 Provide a minimum of three (3) complete owner operation manuals for the District records.

3.14.5.3 Provide a minimum of two (2) complete as built sets of drawings for the District records.

3.14.5.4 Provide all spare parts as described in part 1 of these specifications

3.14.5.5 Provide written confirmation and proposed scheduled dates for follow up training and 1-year complete system test.

3.15 Follow up Training

3.15.1 Provide as a part of this contract, the follow up instructional training period within six (6) months after the final acceptance of the systems. This training shall include a minimum of one four-to-six-hour training period to instruct District personnel in proper operation of all systems and shall instruct the

District technicians how to repair any non-operational parts of the system as required. All defective parts shall be replaced at no cost to the owner.

END OF SECTION

**SECTION 31 10 00
SITE CLEARING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Clearing and protection of vegetation.
- B. Grubbing of root systems of trees and shrubs, abandoned utility lines and structures and other below grade obstructions and debris.
- C. Removal of existing debris.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.
- B. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- C. 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.
- D. Section 01 74 19 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.
- E. Section 02 41 00 - Demolition: Removal of built elements and utilities.
 - 1. Removal of paving and removal if indicated of abandoned utilities.
 - 2. Within building footprint, removal of designated walls, partitions, and other elements; capping and identifying utilities; and removal of concrete foundations.
 - 3. Sitework (Area of Work), removal of designated fences, walls, and other elements; capping and identifying utilities; landscape paving, and removal of concrete foundations.
- F. Section 31 22 00 - Grading: Fill material for filling holes, pits, and excavations generated as a result of removal operations.
- G. Section 32 93 00 - Plants: Relocation of existing trees, shrubs, and other plants.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Site Plan: Showing:
 - 1. Areas for temporary construction and field offices.

1.04 QUALITY ASSURANCE

- A. Clearing Firm: Company specializing in the type of work required.
 - 1. Minimum of five years of documented experience.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Site Clearing 31 10 00 - 1
---	--	-------------------------------

PART 2 PRODUCTS

- A. Fill Material: As specified in Section 31 22 00 - Grading

PART 3 EXECUTION

3.01 SITE CLEARING

- A. Comply with other requirements specified in Section 01 70 00.
- B. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

3.02 SURVEY STAKING IN UNCLEARED EASEMENTS

- A. Flag centerline of utility lines prior to clearing. Contractor shall set offsets for clearing limits to suit the Work.
- B. When the clearing is completed, survey for utility construction in accordance with requirements specified in Section 01 70 00 - Execution and Closeout Requirements.
- C. Contractor shall replace all controls and stakes damaged or destroyed, at no change in Contract Time or Contract Price.

3.03 EXISTING UTILITIES AND BUILT ELEMENTS

- 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. Protect existing structures and other elements that are not to be removed.

3.04 CLEARING

- A. Perform clearing Work within confines of Project area indicated on Drawings or specified elsewhere herein and with strict adherence to the Contract Documents and Geotechnical recommendations.

3.05 VEGETATION

- A. Scope: Remove trees, shrubs, brush, and stumps in areas to be covered by building structure, paving, lawns, and planting beds.
- B. Do not begin clearing until vegetation to be relocated has been removed.
- C. Do not remove or damage vegetation beyond the limits indicated on drawings.
- D. Install substantial, highly visible fences at least 3 feet high to prevent inadvertent damage to vegetation to remain:
 - 1. At vegetation removal limits.
- E. Remove only trees within area to be cleared that have been marked for removal. Confirm trees to be removed with District and Architect before beginning removal process.
 - 1. Cut trunks close and parallel to ground.
 - 2. Remove roots where under or within five feet of proposed structures.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Site Clearing 31 10 00 - 2
---	--	-------------------------------

- 3. Neither remove nor prune trees and shrubbery in public rights-of-way except by written approval of authorities having jurisdiction.
- F. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum disturbance of the subsoil.
- G. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
 - 1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
 - 2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
 - 3. Existing Stumps: Treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
 - 4. Sod: Re-use on site if possible; otherwise sell if marketable, and if not, treat as specified for other vegetation removed.
- H. Dead Wood: Remove all dead trees (standing or down), limbs, and dry brush on entire site; treat as specified for vegetation removed.
- I. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to District.

3.06 GRUBBING

- A. At pipelines, remove all trees or stumps within five feet of the pipeline.
- B. Perform grubbing where indicated on Drawings or as specified herein. Grubbing shall include removal from the ground of all stumps, roots, buried logs and other vegetation not otherwise indicated to remain, and removal and disposal of resulting refuse.
- C. Completely grub areas where unsuitable surface material is to be removed.

3.07 DAMAGED VEGETATION

- A. Neatly prune damaged branches and severed roots.
- B. Apply wound paint to above-ground cuts and abrasions.
- C. If trees and shrubs indicated to remain are damaged excessively, as determined by DSA, Architect or authorities having jurisdiction, remove and replace damaged plants with comparable plants.

3.08 DEBRIS

- A. Remove debris, junk, and trash from site.
- B. Remove logs, rocks and other debris.
- C. Dispose of Debris resulting from clearing and thoroughly clean rights-of-way.
- D. Leave site in clean condition, ready for subsequent work.
- E. Clean up spillage and wind-blown debris from public and private lands.

3.09 DISPOSAL

- A. Debris Disposal: Dispose of all cleared and grubbed materials in a legal manner off site.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Site Clearing 31 10 00 - 3
---	--	-------------------------------

- B. Hazardous Materials:
 1. Immediately notify the DSA should hazardous materials or suspected hazardous materials be encountered.
 2. Dispose of such materials in accordance with all applicable laws and regulations and as directed by authorities having jurisdiction.
 3. Unforeseen conditions will be resolved in accordance with the Conditions of the Contract.
- C. Saleable Materials:
 1. Unless otherwise indicated, all felled trees from which merchantable lumber or firewood can be produced shall become the property of the Contractor.
 2. Unless otherwise indicated, all metallic debris of salvageable value shall become the property of the Contractor.
 3. The Contractor shall remove all saleable materials from the site in a timely manner.
 4. Sale of salvaged and merchantable materials shall be done on site only with prior approval of the District.
- D. Stockpiling Vegetation: Only if specified or indicated under landscape work, stockpile vegetation for subsequent mulching.
- E. Burial and Burning: Debris shall not be buried or burned on site.

3.10 DUST CONTROL

- A. Refer to requirements of:
 1. Section 01 50 00 - Temporary Construction Facilities and Controls.
 2. Section 31 22 00 - Grading.
- B. Minimize dust during clearing and grubbing to protect adjoining property and vehicles parked in the vicinity.
- C. Clean-up: Keep public thoroughfares clear of dust and debris by periodic sweeping and washing down, at least daily at the end of working hours.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Site Clearing 31 10 00 - 4
---	--	-------------------------------

**SECTION 31 22 00
GRADING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Coordinate work of this Section to compliment and coordinate with field conditions and Civil Drawing noted specific referenced requirements. Utilize the most stringent requirements.
- B. Removal of topsoil.
- C. Rough grading and consolidation/compaction the site for site structures and building pads.
 - 1. Preparation for excavation, trenching, backfilling and compacting Work.
- D. Excavation of subsoil, stockpiling for later reuse, and removal of excess from the site.
- E. Preparing of subgrade for walks, pavements and site retaining walls.
- F. Excavating, backfilling and compaction for wet utility lines.
- G. Finish grading.

1.02 RELATED REQUIREMENTS

- A. Document 00 31 00 - Available Project Information: Subsurface Investigations.
- B. Section 01 40 00 - Quality Requirements.
- C. Section 01 45 33 - Code-Required Special Inspections.
- D. Section 01 70 00 - Execution and Closeout Requirements.
- E. Section 31 10 00 - Site Clearing.
- F. Section 31 23 16 - Excavation.
- G. Section 31 23 16.13 - Trenching: Trenching and backfilling for utilities.
- H. Section 31 23 23 - Fill: Filling and compaction.
- I. Section 32 13 13 - Site Concrete.
- J. Section 32 93 00 - Plants: Topsoil in beds and pits.

1.03 SUBMITTALS

- A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.
 - 1. Accurately record location of all changes in finish elevations and gradients which materially affect drainage.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: For conditions not covered in this Section, refer to applicable provisions of the California Building Code (CBC), Chapter 18A - Soils and Foundations, as amended and adopted by authorities having jurisdiction.
- B. Perform Work in accordance with locally adopted {\rs\#1} standards.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Grading 31 22 00 - 1
---	--	-------------------------

1.05 PROTECTION

- A. Dust Control: Comply with requirements specified in Section 01 50 00 - Temporary Facilities and Controls.
- B. Protection:
 - 1. Comply with general requirements specified in Section 01 50 00 - Temporary Facilities and Controls.
 - 2. Provide protection for walks, curbs, drains, and trees and boxing around corners of existing buildings to prevent damage.
 - 3. Keep adjacent roads, streets and drives clear of dirt and debris from earthwork operations.
- C. Underground Utilities:
 - 1. Buried utility lines may exist.
 - 2. If such are encountered, notify DSA, Architect and District and for directions to be followed for preservation, relocation or demolition of utilities.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Topsoil: See Section 31 23 23.
- B. Shoring and Bracing: Provide all materials and services necessary to properly engineer and construct shoring for excavations. Selection of materials and design of shoring, underpinning and bracing of new and existing structures shall be solely the responsibility of the Contractor.
 - 1. Shoring design shall comply with State of California Trenching and Shoring Manual issued by Offices of Structure Construction; 2011.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that survey bench mark and intended elevations for the Work are as indicated.
- B. Verify the absence of standing or ponding water.
- C. Upon discovery of unknown utility or concealed conditions, discontinue affected Work and notify DSA, Architect and District for direction. Unforeseen conditions shall be resolved in accordance with the General Conditions.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect from damage above- and below-grade utilities to remain.
 - 1. Maintain and protect existing utilities remaining which pass through Project area.
- D. Notify utility company to remove and relocate utilities, as required.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Grading 31 22 00 - 2
---	--	-------------------------

- E. Provide temporary means and methods to remove all standing or ponding water from areas prior to grading.
- F. Protect site features to remain, including but not limited to bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs, from damage by grading equipment and vehicular traffic.
- G. Protect trees to remain by providing substantial fencing around entire tree at the outer tips of its branches; no grading is to be performed inside this line.
- H. Protect plants, lawns, and other features to remain as a portion of final landscaping.

3.03 ROUGH GRADING

- A. Eliminate uneven areas and low spots. Remove debris, roots, branches, stones, in excess of 1 inch in size.
- B. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.
 - 1. Coordinate topsoil with Section 10 00 - Site Clearing and Grubbing.
- C. Do not remove topsoil when wet.
- D. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.
- E. Do not remove wet subsoil , unless it is subsequently processed to obtain optimum moisture content.
- F. When excavating through roots, perform work by hand and cut roots with sharp axe.
- G. See Section 31 23 23 for filling procedures.
- H. All permanent cut or fill slopes shall have a maximum slope of 2:1 (H:V) ratio, horizontal to vertical and shall comply with applicable requirements of the Geotechnical Report and California Building Code (CBC).
- I. Benching Slopes: Horizontally bench existing slopes greater than 5:1 (H:V) to key fill material to slope for firm bearing.
- J. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.
- K. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack surface water control.
- L. Grade top perimeter of excavations to prevent surface water from draining into excavation.
 - 1. Provide dewatering of excavations as required to ensure suitable conditions for concrete and backfilling operations.
- M. Uniformly grade areas as shown on Drawings to tolerances specified in this Section..
 - 1. Evenly grade between points where elevations are shown or between points of Work and existing grades.
- N. Slope rough grade away from building perimeter at gradient indicated.
 - 1. Upaved area slope for a distance of 10 feet from the building: Not less than one unit vertical in 20 units horizontal or 5 percent.
 - a. CBC Section 1804A.4.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Grading 31 22 00 - 3
---	--	-------------------------

- 2. When supported by soil conditions and climate; slope not less than 1:48 or 2 percent in unpaved areas.
 - a. CBC Section 1804A.4, Exception.
- O. Make grade changes gradual. Blend slopes into level areas.

3.04 SOIL REMOVAL AND STOCKPILING

- A. Stockpile topsoil to be re-used on site; remove remainder from site.
 - 1. Topsoil and vegetation layers, root zones, and similar surface materials should be stripped and stockpiled for either reuse in landscape surface areas or removed from the site.
- B. Stockpile subsoil on site for backfill, if soil is appropriate.
 - 1. Stockpile subsoil to depth not exceeding 8 feet.
- C. Remove all lumped subsoil, boulders and rock in excess of 3 inches in greatest dimension.
- D. Stockpile subsoil to be re-used on site; remove remainder from site.
- E. Stockpiles: Use areas designated on site; pile depth not to exceed 8 feet; cover to protect from erosion.

3.05 FINISH GRADING

- A. Before Finish Grading:
 - 1. Verify building and trench backfilling have been inspected.
 - 2. Verify subgrade has been contoured and compacted.
- B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove soil contaminated with petroleum products.
 - 1. Comply with CBC Section 1804A.3.
- C. Where topsoil is to be placed, scarify surface to depth of 6 inches.
- D. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 6 inches.
- E. Place topsoil in areas indicated.
- F. Place topsoil where required to level finish grade.
- G. Place topsoil during dry weather.
- H. Remove roots, weeds, rocks, and foreign material while spreading.
- I. Near plants spread topsoil manually to prevent damage.
- J. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.
- K. Lightly compact placed topsoil.
- L. Maintain stability of topsoil during inclement weather. Replace topsoil in areas where surface water has eroded thickness below specifications.

3.06 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus 0.10 foot (1-3/16 inches) from required elevation.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Grading 31 22 00 - 4
---	--	-------------------------

- B. Top Surface of Finish Grade: Plus or minus 0.04 foot (1/2 inch).
- C. Athletic Field Final Porous Stone base grade: Utilizing laser guided equipment, fine grade to the required tolerances leaving behind no tire tracks or indentations.
- D. Top Surface Under Paving: Plus or minus 0.04 foot (1/2 inch) from required elevation.

3.07 REPAIR AND RESTORATION

- A. Existing Facilities, Utilities, and Site Features to Remain: If damaged due to this work, repair or replace to original condition.
- B. Trees to Remain: If damaged due to this work, trim broken branches and repair bark wounds; if root damage has occurred, obtain instructions from Architect as to remedy.
- C. Other Existing Vegetation to Remain: If damaged due to this work, replace with vegetation of equivalent species and size.

3.08 FIELD QUALITY CONTROL

- A. See Section 31 23 23 for compaction density testing.
- B. Field Quality Control:
 - 1. Field inspections and testing shall be performed in accordance with requirements specified in Section 01 40 00 and 01 45 33.
 - 2. Make required quality control submittals in accordance with requirements specified.
- C. Athletic Field: Provide grading plan and final survey.
 - 1. Perform prior to turf installation, a grade verification survey.
 - 2. Final grade verification shall consist of site survey conducted by the surveyor consisting of a 20 ft. x 20 ft. grid.
 - 3. Additional planarity verification shall consist of string line and 10 ft strait edge checks at random over entire area which has been prepared for synthetic turf.
 - 4. Immediately remediate any areas found not to meet specification.
- D. Non-compliance: Should grade elevations, tests of fill or backfill indicate non-compliance with required elevations or density, Contractor shall over-excavate, recompact and retest until specified grade or density is obtained.
 - 1. Costs and Time associated with remedial Work and retesting shall be in accordance with provisions of the General Conditions.
 - 2. Retesting to demonstrate compliance shall be by a testing laboratory acceptable to District and shall be at Contractor's expense.

3.09 CLEANING

- A. Remove unused stockpiled topsoil and subsoil. Grade stockpile area to prevent standing water.
- B. Leave site clean and raked, ready to receive landscaping.

3.10 PROTECTION

- A. Protect completed grading from erosion from weather and traffic.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Grading 31 22 00 - 5
---	--	-------------------------

B. Over-excavate and recompact areas damaged by construction activities and weather.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Grading 31 22 00 - 6
---	--	-------------------------

**SECTION 31 23 16.13
TRENCHING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Backfilling and compacting for utilities from 5 FEET outside the building to connection point on-site, where indicated on Drawings.

1.02 RELATED REQUIREMENTS

- A. 00 31 00 - Available Project Information: Geotechnical report; bore hole locations and findings of subsurface materials.
- B. Section 01 41 00 - Regulatory Requirements: Code Compliance.
- C. Section 31 22 00 - Grading: Site grading.
- D. Section 31 23 16 - Excavation: Building and foundation excavating.

1.03 DEFINITIONS

- A. Finish Grade Elevations: Indicated on drawings.
- B. Subgrade Elevations: Indicated on drawings.

1.04 REFERENCES

- A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
- C. Compaction Density Test Reports.

1.06 COORDINATION OF SPECIFICATION REQUIREMENTS

- A. Coordinate these Specification Section requirements with specifications included on Drawings. Comply with more stringent requirements and with those requirements of the authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site, locate stockpiles where designated.
 - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 - 2. Prevent contamination.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Trenching 31 23 16.13 - 1
---	--	------------------------------

3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 FILL MATERIALS

- A. General Fill: Subsoil excavated on-site.
- B. Structural Fill: Subsoil excavated on-site.
 1. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
- C. Concrete for Fill: Lean concrete.
- D. Granular Fill - Gravel: Pit run washed stone; free of shale, clay, friable material and debris.
 1. Graded in accordance with ASTM C136/C136M, within the following limits:
 - a. 3/4 inch sieve: 95 to 100 percent passing.
- E. Granular Fill - Pea Gravel: Natural stone; washed, free of clay, shale, organic matter.
 1. Grade in accordance with ASTM D2487 Group Symbol GM.
- F. Sand: Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter.
 1. Grade in accordance with ASTM D2487 Group Symbol SW.
- G. Topsoil: Topsoil excavated on-site.
 1. Select.
 2. Graded.
 3. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.
 4. Acidity range (pH) of 5.5 to 7.5.
 5. Containing a minimum of 4 percent and a maximum of 25 percent inorganic matter.
 6. Complying with ASTM D2487 Group Symbol OH.

2.02 SOURCE QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for testing and analysis of soil material.
- B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.
- C. If tests indicate materials do not meet specified requirements, change material and retest.
- D. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 DIG ALERT NOTIFICATION

- A. Before any excavation in or near the public right-of-way, contact the Underground Service Alert of Southern California (Dig Alert) at 811 for information on buried utilities and pipelines.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Trenching 31 23 16.13 - 2
---	--	------------------------------

- B. Delineation of the proposed excavation site is mandatory. Mark the area to be excavated with water soluble or chalk based white paint on paved surfaces or with other suitable markings such as flags or stakes on unpaved areas.
- C. Call at least Two (2) full working days prior to digging.
- D. If the members (utility companies) have facilities within the work area, they will mark them prior to the start of your excavation and if not, they will let you know there is no conflict. A different color is used for each utility type (electricity is marked in red, gas in yellow, water in blue, sewer in green, telephone and cable TV in orange).
- E. The Law requires to hand expose to the point of no conflict 24 inches on either side of the underground facility, to know its exact location before using power equipment.
- F. If caught digging without a Dig Alert ticket fines can be as much as \$50,000 per California government code 4216.

3.02 EXAMINATION

- A. Verify that survey bench marks and intended elevations for the work are as indicated.

3.03 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Locate, identify, and protect utilities that remain and protect from damage.
- C. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- D. Protect plants, lawns, rock outcroppings, and other features to remain.
- E. Grade top perimeter of trenching area to prevent surface water from draining into trench. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by the Architect.

3.04 TRENCHING

- A. Excavate subsoil required for conduits, storm drain, sanitary sewer, water and gas piping to municipal utilities.
- B. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- C. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.
- D. Trenches Parallel to Footings: Do not place the trench below a 1 vertical to 2 horizontal from 9 inches above the bottom edge of the footing and no closer than 18 inches from the face of footing. CBC Section 1809A.14.
- E. Do not interfere with 45 degree bearing splay of foundations.
- F. Cut trenches wide enough to allow inspection of installed utilities.
- G. Hand trim excavations. Remove loose matter.
 - 1. Hand trim for bell and spigot pipe joints.
- H. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.
- I. Remove lumped subsoil, boulders, and rock up to 1/3 cubic yard measured by volume.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Trenching 31 23 16.13 - 3</p>
--	--	---

- J. Remove excavated material that is unsuitable for re-use from site.
- K. Stockpile excavated material to be re-used in area designated in Section 31 22 00.
- L. Remove excess excavated material from site.
- M. Provide temporary means and methods, as required, to remove all water from trenching until directed by the Architect. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.
- N. Determine the prevailing groundwater level prior to trenching. If the proposed trench extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the Architect.

3.05 PREPARATION FOR UTILITY PLACEMENT

- A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
- B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.
- D. Support pipe and conduit during placement and compaction of bedding fill.

3.06 BACKFILLING

- A. Backfill to contours and elevations indicated using unfrozen materials.
- B. Fill up to subgrade elevations unless otherwise indicated.
- C. Employ a placement method that does not disturb or damage installed piping and conduits, or other work.
- D. Systematically fill and compact as as to achieve 90 percent relative compaction without damaging conduit or pipe. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- E. Maintain optimum moisture content of fill materials to attain required compaction density.
- F. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.
- G. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth or as directed by the Geotechnical Report.
- H. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
- I. Correct areas that are over-excavated.
 - 1. Thrust bearing surfaces: Fill with concrete.
 - 2. Other areas: Use general fill, flush to required elevation, compacted to minimum 90 or 95 percent of maximum dry density as applicable for the fill area.
- J. Compaction Density Unless Otherwise Specified or Indicated:
 - 1. Under paving and similar construction: 95 percent of maximum dry density.
 - 2. At other locations: 90 percent of maximum dry density.
- K. Reshape and re-compact fills subjected to vehicular traffic.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Trenching 31 23 16.13 - 4</p>
--	--	---

3.07 BEDDING AND FILL AT SPECIFIC LOCATIONS

- A. Use general fill unless otherwise specified or indicated.
- B. Utility Piping, Conduits, and Duct Bank:
 - 1. Bedding: Use Fill Type SP or SW (ASTM D2487) or SM with sand equivalent of 30 or greater per ASTM D2419, 3 inches thick, compacted to 90 percent..
 - 2. Cover with Fill Type SP, SW, SM, GM per ASTM D2487.
 - 3. Fill up to subgrade elevation.
 - 4. Compact in maximum 8 inch lifts to 95 percent of maximum dry density.
 - 5. Gas Piping: As required by the Gas Company.

3.08 TOLERANCES

- A. Top Surface of General Backfilling: Plus or minus 1.2 inch from required elevations.
- B. Top Surface of Backfilling Under Paved Areas: Plus or minus 1.2 inch from required elevations.

3.09 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Control, for general requirements for field inspection and testing.
- B. Perform compaction density testing on compacted fill in accordance with ASTM D1556 or ASTM D6938.
- C. See Section 31 23 23 for compaction density testing.
- D. Correct unauthorized excavation at no cost to District.
- E. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D1557 ("modified Proctor"), AASHTO T 180, or ASTM D698 ("standard Proctor").
- F. If tests indicate work does not meet specified requirements, remove work, replace and retest at no additional cost to District.
- G. Correct areas over excavated by error in accordance with Section 31 23 23 - Fill.
- H. Frequency of Tests: See Section 31 22 00 - Grading.

3.10 CLEANING

- A. Leave unused materials in a neat, compact stockpile.
- B. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- C. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

3.11 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01 50 00 - Temporary Construction Facilities and Controls.
- B. Recompact fills subjected to vehicular traffic.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Trenching 31 23 16.13 - 5
---	--	------------------------------

**SECTION 32 11 23
AGGREGATE BASE COURSES**

1.01 SECTION INCLUDES

- A. Aggregate base course.
- B. Paving aggregates.
- C. Soil sterilization.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 - Grading: Preparation of site for base course.
- B. Section 31 23 16.13 - Trenching: Compacted fill over utility trenches under base course.
- C. Section 32 12 16 - Asphalt Paving: Finish and binder asphalt courses.
- D. Section 32 13 13 - Site Concrete: Finish concrete surface course.

1.03 REFERENCE STANDARDS

- A. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- B. SSPWC (Greenbook) - Standard Specifications for Public Works Construction.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Samples: 10 lb sample of each type of aggregate; submit in air-tight containers to testing laboratory.
- C. Materials Sources: Submit name of imported materials source.
- D. Certificates of Conformance: Aggregate and sterilant materials.
- E. Aggregate Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
- F. Compaction Density Test Reports.

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements: Where reference is made to Standard Specifications, the following shall apply.
 - 1. Perform off-site Work in public rights-of-way in accordance with requirements of authorities having jurisdiction, including SSPWC (Greenbook). For conditions not indicated otherwise on Contract Drawings, conform to Standard Details adopted by authorities having jurisdiction.
 - 2. Perform on-site Work as indicated and referenced on Contract Drawings and as specified herein.
- B. The quantity of volatile organic compounds (VOC) used in weed killer, tack coat, primer and other materials shall not exceed limits permitted under current regulations of:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Aggregate Base Courses 32 11 23 - 1
---	--	--

1. Local Air Quality Management District (AQMD).
- C. Source Quality Control: Obtain materials from one source throughout.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. When necessary, store materials on site in advance of need.
- B. When aggregate materials need to be stored on site, locate where directed by District.
- C. Aggregate Storage, General:
 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 2. Prevent contamination.
 3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Aggregate Type Class II: Coarse or crushed aggregate, conforming to Municipality, ASTM F588 Section 200-2.2.
- B. Coarse Aggregate: Pit run washed stone; free of shale, clay, friable material and debris.
 1. Graded in accordance with ASTM D2487 Group Symbol GW.
- C. Herbicide: Comply with all applicable environmental protection and hazardous materials laws and regulations .
 1. Comply with current EPA acceptable standard and the California Department of Pesticide Regulations for soils sterilant.
 2. Comply with the "Healthy Schools Act" as amended in 2014.
 3. Obtain product approval from District, prior to purchase and use.
 4. Sterilant: Commercial grade for commercial application.
 - a. Selected as appropriate for the environment in which is it to be placed.
 5. Contractor shall be licensed with the State of California to apply sterilant.
 6. Sterilant: Commercial grade for commercial application.
 7. Payment for soil sterilization: Include full compensation for application and all materials and incidental work required.
 8. Application Rate: Follow manufacturer recommendations.
 9. Acceptable Manufacturers:
 - a. Dow AgroSciences; Spike 80DF: www.dowagro.com.
 - b. Pro-Serve Inc.; Bare-Spot Monobor-Chlorate: www.pro-serveinc.com.
 - c. Casoron 50W by Uniroyal Chemical Co., Inc.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Geotextile Fabric: Non-biodegradable, non-woven, placed under base;

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Aggregate Base Courses 32 11 23 - 2
---	--	--

2.02 SOURCE QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for general requirements for testing and analysis of aggregate materials.
- B. Where aggregate materials are specified using ASTM D2487 classification, testing of samples for compliance shall be provided before delivery to site.
- C. If tests indicate materials do not meet specified requirements, change material and retest.
- D. Provide materials of each type from same source throughout the Work.

2.03 EXAMINATION

- A. Establishment of Grades
 - 1. Set grade stakes per Section 01 70 00 - Execution and Closeout Requirements.
 - 2. All work shall conform to the lines, elevations, and grades shown on the Drawings.
 - a. Use three consecutive points set on the same slope together so that any variation from a straight grade can be detected.
 - b. Report any such variation to the Architect. Contractor shall be responsible for any error in the grade of the finished work.
 - 3. Grade or location stakes lost or disturbed, shall be reset by the Surveyor at no additional expense to District.
 - 4. Areas having drainage gradients of 2 percent or more, provide elevation stakes, set with instrument, at grid intervals of 25 feet.
 - a. Intermediate stakes may be set by using a tightly-drawn string line over the tops of adjacent stakes.
 - b. Grade stakes must be set at all grade breaks, grade changes, etc.
 - 5. Areas having drainage gradients of less than 2 percent; provide elevation stakes, set with instrument, at 10 foot intervals.
 - a. Grade stakes must be set at all grade breaks, grade changes, etc.
- B. Verify that survey bench marks and intended elevations for the work are as indicated.
- C. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

2.04 PREPARATION

- A. Stockpiling:
 - 1. Clear and level storage sites prior to stockpiling of material.
 - 2. Stockpile all materials, including approved material available from excavation and grading, in the manner and at the locations designated.
 - 3. Aggregates shall be stockpiled on the cleared and leveled areas designated by the Construction Manager to prevent segregation.
 - 4. Materials obtained from different sources shall be stockpiled separately.
- B. Soil Sterilant:
 - 1. Sterilize soil areas to receive paving.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Aggregate Base Courses 32 11 23 - 3
---	--	--

2. Apply soil sterilant in accordance with manufacturer's instructions and applicable environmental regulations.
 3. Take care to confine application to the areas to be paved. Sterilant shall not be applied within 2 feet of planting areas.
- C. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- D. Do not place aggregate on soft, muddy, or frozen surfaces.
- E. Place and compact aggregate base material in accordance with SSPWC (Greenbook), Subsection 301-2. Place aggregate base below curbs and gutters and paving also, compacted to 95 percent at vehicular traffic and 90 percent at pedestrian-only traffic.
- F. Application of Base Course:
1. After preparing the subgrade, Avoid all vehicular or machine traffic on the subgrade.
 - a. Should it be necessary to haul over the prepared subgrade, drag and roll the traveled way as frequently as may be necessary to remove ruts, cuts, and breaks in the surface.
 - b. Rake and hand tamp all cuts, ruts, and breaks in the surface of the subgrade that are not removed by the above operations.
 - c. Equip with pneumatic tires all equipment used for transporting materials over the prepared subgrade.
 2. Do not permit continued use of sections of prepared subgrade for hauling, so as to cut up or deform it from the true cross-section. Protect the prepared subgrade from all traffic.
 3. Maintain the surface in its finished condition until the succeeding layer is placed.
- G. Under Bituminous Concrete Paving:
1. The above subgrade preparation recommendations are based on the assumption that soils encountered during field exploration are representative of soils throughout the site.
 - a. However, there can be unforeseen and unanticipated variations in soils between points of subsurface exploration. For this reason, the actual subgrade preparation will have to be determined on the basis of in-grading observations and testing performed by representatives of the project geotechnical consultant.
 2. Provide grade stakes and elevations by a California Licensed Surveyor (LS) for the Geotechnical Engineer.
 - a. Verify that the over-excavation depths, shown on the construction drawings for asphalt concrete pavement structural sections, have been achieved prior to re-compaction.
 3. Correct irregularities by dressing down or filling as may be required, to bring areas to true subgrade elevations.
 4. Where filling is required, scarify the subgrade to bond the new material to the in place material; use additional material as required at no additional cost. Subject to the approval of the Architect.
 5. Remove excess material from the site to a legal disposal area.
- H. Under Portland Cement Concrete Paving:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Aggregate Base Courses 32 11 23 - 4
---	--	--

1. Compact to 95 percent of maximum dry density and 90 percent at pedestrian-only traffic.
- I. Apply herbicide to finished surface.

2.05 TOLERANCES

- A. Subgrade Tolerances:
 1. Subgrade for Pavement: Do not vary more than 0.02 ft..
 2. Subgrade for Subbase or Base Material: Do not vary more than 0.04 ft..
 3. Variations within the above specified tolerances shall be compensating so that the average grade and cross section specified are met.
- B. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- C. Scheduled Compacted Thickness: Within 1/4 inch.
- D. Variation From Design Elevation: Within 1/2 inch.

2.06 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for general requirements for field inspection and testing.
- B. Compaction density testing shall be performed on compacted aggregate base course in accordance with ASTM D1556 or ASTM D6938.
- C. Results will be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with AASHTO T 180, ASTM D698 ("standard Proctor"), or ASTM D1557 ("modified Proctor").
- D. If tests indicate work does not meet specified requirements, remove work, replace and retest.
- E. Proof roll compacted aggregate at surfaces that are under slabs-on-grade and paving.

2.07 CLEANING

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- B. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Aggregate Base Courses 32 11 23 - 5
---	--	--

**SECTION 32 12 16
ASPHALT PAVING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Single course bituminous concrete paving.
- B. Double course bituminous concrete paving.
- C. Surface sealer.
- D. This section compliments and shall be coordinated with Civil Drawing specifications / requirements. The most stringent requirements shall be utilized.
- E. Asphaltic concrete paving for vehicular traffic and curbs, including necessary patching and repair of damaged new and existing paving.
- F. Patching and repair of existing asphaltic concrete paving for previous damage, for underground utility work and where damaged by new construction.
 - 1. Bituminous Surfacing Repair: Areas removed for utility trenches, heaved by tree roots, cracked areas, protruding areas where pavement meets hard surfaces, depressed areas, holes and areas around new structures, and raveled bituminous pavement.
 - 2. Areas heaved by tree roots, cracked areas, holes, and trenches.

1.02 RELATED REQUIREMENTS

- A. Section 02 41 00 - Demolition: Selective demolition, site demolition, structure removal.
- B. Section 31 22 00 - Grading: Preparation of site for paving and base.
- C. Section 32 11 23 - Aggregate Base Courses: Aggregate base course.
- D. Section 32 17 23 - Pavement Markings.

1.03 REFERENCE STANDARDS

- A. AI MS-19 - Basic Asphalt Emulsion Manual.
- B. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.
- C. SSPWC (Greenbook) - Standard Specifications for Public Works Construction.

1.04 SUBMITTALS

- A. Materials List: List source and quality standard for all asphaltic concrete materials.
- B. Mix Design:
 - 1. Formulate a job-mix formula using the Hveem method in accordance with SSPWC (Greenbook) Section 203-6.2 and submit for approval.
 - 2. Submit designs for asphaltic concrete prepared by a materials laboratory under direct supervision of a Civil Engineer licensed in the State of California or a standard mix design proven in actual performance.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Asphalt Paving 32 12 16 - 1
---	--	--------------------------------

3. Resultant Mixture: Hveem properties conforming to SSPWC (Greenbook) Section 203-6.4.3.
- C. Certifications:
1. Weighmaster's Certificates or certified delivery tickets for each truckload of bituminous material delivered to site.
 2. Certificates of Conformance: Asphalt, aggregate and sterilant materials.
 - a. 20 days prior to the delivery of aggregates, asphalt materials, and paving mixes to the project site, submit certificates and test results of compliance of such materials with these specifications.
 - b. Submit certificates of compliance from the supplier for bituminous materials for paint binder, asphaltic concrete, and seal coat.
 - c. Submit weigh master's certificates or certified delivery tickets for each truck load of asphaltic material delivered to the project site.
 - d. Upon completion of the weed control treatment, and as a condition for final acceptance, furnish a written certificate stating the brand name of the sterilant and the manufacturer, and that the sterilant used had at least the minimum required concentration, and that the rate and method of application complied in every respect with the conditions and standards contained herein.
- D. Samples:
1. Prior to the delivery of specified aggregate to the site, submit samples of the material for the Inspector's acceptance in accordance with SSPWC (Greenbook) Section 4-1.4. Samples shall be typical of materials to be furnished from the proposed source and in conformance with the specified requirements.
 2. Provide aggregate base gradation and quality certifications, dated within 30 days of submittal.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with locally adopted {\rs\#1}.
- B. Mixing Plant: Conform to Locally adopted ASTM F588.
 1. Asphaltic Concrete Producers Qualifications: Use only materials furnished by a bulk asphaltic concrete producer regularly engaged in production of hot mix, hot laid bituminous concrete.
 2. Applicator Qualifications: Paving machine and roller operators shall be fully trained and experienced in the installation of asphaltic concrete paving on projects of similar size and complexity.
- C. Testing and analysis of granular base material and asphaltic concrete paving mix shall be performed under provisions of Division 01.
- D. Obtain materials from same source throughout.

1.06 FIELD CONDITIONS

- A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen; or when rain is imminent.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Asphalt Paving 32 12 16 - 2
---	--	--------------------------------

1. Tack Coats: Minimum surface temperature of 60 deg F.
 2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
 3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.
- B. Place bitumen mixture when temperature is not more than 15 F degrees below bitumen supplier's bill of lading and not more than maximum specified temperature.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Comply with applicable code for paving work on public property.
- B. Where reference is made to SSPWC (Greenbook), the following shall apply.
1. For conditions not indicated otherwise on Contract Drawings, conform to Standard Details adopted by authorities having jurisdiction, including Standard Details for Public Works Construction, as amended and adopted by those authorities.
 2. Perform on-site Work as indicated and referenced on Contract Drawings and as specified herein.
- C. The quantity of volatile organic compounds (VOC) used in weed killer, seal coat, tack coat, primer, and other materials shall not exceed limits permitted under current regulations of local Air Quality Management District (AQMD).

2.02 MATERIALS

- A. General: Aggregate base, prime coat paint binder, bituminous surface course and other materials shall be as noted on the Contract Drawings and shall comply with requirements of authorities having jurisdiction.
- B. Asphalt Cement: ASTM D 946.
- C. Asphalt Concrete Materials: SSPWC (Greenbook), Subsection 203-6.
- D. Aggregate for Base Course: See Section 32 11 23 - Aggregate Base Course.
- E. Aggregate for Binder Course : Angular crushed washed stone; free of shale, clay, friable material and debris.
1. Graded in accordance with ASTM D2487 Group Symbol GW.
- F. Mineral Filler: Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter.
- G. Fiber Reinforcement: Synthetic fibers shown to have long-term resistance to deterioration when in contact with alkalis and moisture; 1/2 inch length.
- H. Geotextile Fabric: Non-biodegradable, non-woven Petromat Enviro manufactured by Propex Operating Company, LLC.
1. Geotextile Construction: Needle-punched nonwoven geotextile composed of 100% polypropylene or polypropylene / recycled polyester blend, staple fiber and heat calendered on one side.
- I. Crack Filler:

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p style="text-align: right;">Asphalt Paving 32 12 16 - 3</p>
--	--	--

1. Cracks less than 1/2 inch in width: GuardTop Crackfiller or equal.
 2. Cracks 1/2 inch or greater in width: #4 Sheet mix asphalt.
- J. Primer: In accordance with locally adopted {\rs\#1}.
- K. Tack Coat: Homogeneous, medium curing, liquid asphalt.
- L. Seal Coat: AI MS-19, slurry type.
1. Asphalt Emulsion, www.aema.org, SS1-h, per SSPWC (Greenbook) Section 203-9.
 2. Acceptable Manufacturers:
 - a. Blue Diamond Asphalt; Satin Seal: www.bluediamondasphalt.com.
 - b. Diversified Asphalt Product; Over Kote: www.diversifiedasphalt.com.
 - c. Gold Star Asphalt Products: goldstarsphalt.com
 - d. SealMaster Pavement Products & Equipment; MasterSeal: sealmaster.net.
 - e. Vulcan Materials Company; GuardTop: www.vulcanmaterials.com.
 - f. Western Colloid Products; Park Top: www.westerncolloid.com.
 - g. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 ASPHALT PAVING MIXES AND MIX DESIGN

- A. Asphalt Surfacing Materials: Provide asphalt surfacing meeting the following requirement, furnished from a commercial asphalt central mixing plant.
- B. Use dry material to avoid foaming. Mix uniformly.
- C. Base Course: 4.5 to 5.8 percent of asphalt cement by weight in mixture in accordance with ASTM F588 Section 203-6.4.3, Type B.
- D. Binder Course: 4.5 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.
1. CSS-1 h and conform to the requirements of SSPWC (Greenbook), Section 203-3 Emulsified Asphalt.
- E. Parking Lot Wearing Course: 4.6 to 6.0 percent of asphalt cement by weight in mixture in accordance with {\rs\#1} Section 203-6.4.3, Type C2.
1. Provide at least two courses of asphalt when Type C2 asphalt pavement is greater than 3 inches.
 2. Surface Course Minimum Thickness: 1 inch and a maximum of 2 inches.
- F. Playground Area Wearing Course: 4.8 to 6.5 percent of asphalt cement by weight in mixture in accordance with ASTM F588 Section 203-6.4.3, Type D2.
1. Provide at least two courses of asphalt when Type D2 asphalt pavement is greater than 1-1/2 inches.
 2. Surface Course Minimum Thickness: 1 inch and a maximum of 1-1/2 inches.
- G. Submit proposed mix design of each class of mix for review prior to beginning of work.

2.04 SOURCE QUALITY CONTROL

- A. Test mix design and samples in accordance with AI MS-2.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Asphalt Paving 32 12 16 - 4
---	--	--------------------------------

- B. Submit asphaltic concrete mix design proposed by the Contractor to the Engineer for review.
- C. Proposed mix to be tested for conformance with the specifications, including grading, asphalt content and stability.

2.05 ACCESSORIES

- A. Headers and Stakes:
 - 1. 2 x 6 inch nominal Redwood, Construction Heart Grade, or preservative treated douglas fir (PTDF), except at curves provide laminated 1 x 6 inch nominal PTDF., unless indicated otherwise on Drawings
 - 2. Stakes: 2 x 4 x 18 inch long Redwood, or 2 x 3 x 18 inch long PTDF; at 48 inch on center maximum.
 - 3. Nails: Common, use hot dipped galvanized only, 12d minimum.
- B. Pavement Reinforcing Fabric: Non-woven polypropylene fabric conforming to SSPWC (Greenbook), Subsection 213-1.
 - 1. Basis of Design Product: Petromat as manufactured by Propex Fabrics inc.; www.geotextile.com, or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Refer to geotechnical report referenced in section 00 31 00 - Available Project Information, provided under separate cover, notes on Contract Drawings, and requirements of authorities having jurisdiction.
- B. Verify that compacted subgrade and granular base is dry and ready to support paving and imposed loads.
- C. Verify gradients and elevations of base are correct.
- D. Fine grading, checking, shaping, and compacting of subgrade shall be complete before start of asphaltic concrete Work.
- E. Soil Sterilant: Sterilize soil areas to receive asphaltic concrete paving. Apply soil sterilant in accordance with manufacturer's instructions and applicable environmental regulations. Take care to confine application to the areas to be paved. See Section 32 11 23 - Aggregate Base Courses for product information.
- F. Curbs and Gutters: Gutters shall be in place and cured prior to start of asphaltic concrete Work. Provide lumber ramping at all locations where rolling equipment or vehicles cross new concrete paving, curbs and gutters.
- G. Headers: Place headers with tops flush with finish asphaltic concrete surfaces. Back headers with stakes.
 - 1. Install headers along edge of bituminous surfacing abutting turf, earth, or planting area, unless indicated otherwise.
 - 2. Install headers so the bottom surface has continuous bearing on solid grade. Where excavation for headers is undercut, thoroughly tamp soil under the header. Compact backfill on both sides of header to the density of adjacent undisturbed earth.

<p>Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02</p>		<p>Asphalt Paving 32 12 16 - 5</p>
--	--	---

3. Fasten headers in place with redwood or Douglas fir stakes of length necessary to extend into solid grade a minimum of 12 inches. Stakes shall be of sound material, neatly pointed, driven vertically, and securely nailed to headers. Space stakes, not to exceed 4 feet on centers with top of stakes set one inch below top of header. Provide a minimum of 2-12d galvanized common nails through each stake.
 4. Remove existing headers where new surfacing is installed adjacent to existing surfacing.
 5. Install temporary headers at transverse joints of paving where continuous paving operations are not maintained.
 6. Provide additional stakes and anchorage as required to fasten headers in place
- H. Do not asphalt concrete on any surface, which contains ponded water or excessive moisture in the opinion of the Architect or consulting engineer.
1. If paving operations are in progress and rain or fog forces a shut down, loaded trucks in transit shall return to the plant, and no compensation will be allowed therefore.
 2. Provide canvas tarpaulins to cover all loads of asphalt from the time that the mixture is loaded until it is discharged from the delivery vehicle, unless otherwise directed in writing.

3.02 PAVEMENT REPAIR REMOVAL

- A. Remove bituminous and concrete pavement in accordance with applicable provisions of SSPWC (Greenbook) Section 300 - Earthwork.
- B. Pavement Heaved By Roots:
 1. Remove pavement to limits of distortion and expose roots.
 2. Trim roots to provide at least 12 inch clearance to pavement.
- C. Remove protruding bituminous surfaces flush with the surrounding grade using a suitable tool or equipment so that adjacent finishes are not blackened.
- D. Remove raveled and depressed bituminous pavement to limits indicated or required.
- E. Saw cut existing improvements, trim holes and trenches in bituminous and concrete pavement to permit mechanical hand tampers to compact the fill.
- F. Remove broken concrete by saw cutting. If the required cut line is within 30 inches of a score or joint line or edge, cut and remove to the score, joint line, or edge.

3.03 EXCAVATING, BACKFILLING AND COMPACTING FOR REPAIR

- A. Conform to requirements in Section 31 23 16.13 - Trenching, as required.
- B. Where subgrade or base is deemed to be unstable or otherwise unsuitable, excavate such materials to firm earth, and replace with a required material. Install and compact fill materials in accordance with the requirements of related Specification sections.

3.04 HEADERS

- A. Install headers along edge of bituminous surfacing abutting turf, earth, or planting area, unless indicated otherwise.
- B. Install headers so the bottom surface has continuous bearing on solid grade.
 1. Where excavation for headers is undercut, thoroughly tamp soil under the header.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Asphalt Paving 32 12 16 - 6
---	--	--------------------------------

- 2. Compact backfill on both sides of header to the density of the adjacent undisturbed grade.
- C. Fasten headers in place with redwood or Douglas fir stakes of length necessary to extend into solid earth a minimum of 12 inches.
 - 1. Stakes shall be of sound material, neatly pointed, driven vertically, and securely nailed to headers.
 - 2. Space stakes, not to exceed 4 feet on centers with top of stakes set one inch below top of header.
 - 3. Provide a minimum of two 12d galvanized common nails through each stake.
- D. Remove existing headers where new surfacing is installed adjacent to existing surfacing.
- E. Install temporary headers at transverse joints of paving where continuous paving operations are not maintained.
- F. Provide additional stakes and devices as required to fasten headers.

3.05 RESURFACING

- A. Holes and Trenches:
 - 1. Remove loose dirt and backfill with cement-sand slurry allowing for surfacing one inch thicker than existing.
 - 2. Resurface flush with existing adjoining pavement installing the same type of materials and section provided in existing improvements.
- B. Other Areas:
 - 1. Other surface improvements damaged or removed shall be cut to a neat even line and excavated one inch below the bottom of the existing pavement.
 - 2. Resurface by following the original grades and installing the same type of materials provided in existing improvements.
- C. Where bituminous surfacing abuts concrete, masonry, walks or paving, tamp joint smooth, if necessary, as described above to obtain a uniformly even joint, true to line and grade. Tamp and smooth materials before asphalt cools.

3.06 BASE COURSE

- A. See Section 32 11 23.
- B. Unless otherwise indicated, base course shall be crushed aggregate base, fine grade, 3 inches thick or equal to thickness of the existing base, whichever is greater.
- C. Inspector will examine the base before the paving has begun. Correct any deficiencies before the paving is started.
- D. Wherever asphaltic pavement does not terminate against a curb, gutter, or another pavement, provide and install a redwood or pressure treated Douglas fir header at the line of termination.

3.07 PREPARATION - PRIMER

- A. Apply primer in accordance with manufacturer's instructions.
- B. Apply primer on aggregate base or subbase at uniform rate of 0.25 gal/sq yd.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Asphalt Paving 32 12 16 - 7
---	--	--------------------------------

- C. Apply primer to contact surfaces of curbs, gutters.
- D. Use clean sand to blot excess primer.

3.08 PREPARATION - TACK COAT

- A. Apply tack coat in accordance with ASTM F588 Section 302-5.4.
- B. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 0.10 gal/sq yd.
- C. Apply tack coat to contact surfaces of curbs, gutters and previously placed or existing paving.
- D. Joining Pavement: Expose, cut and clean edges of existing pavement to straight, vertical surfaces for full depth of existing pavement.
 - 1. Paint edge with asphalt emulsion before placing new asphaltic concrete.
 - 2. Joints in New Paving: In accordance with SSPWC (Greenbook).

3.09 PLACING ASPHALT PAVEMENT - SINGLE COURSE

- A. Install Work in accordance with {rs\#1} Subsection 302-5.
- B. Asphalt concrete of the class indicated in Part 2 shall be laid in courses conforming to SSPWC (Greenbook) Table 302-5.5(A), unless otherwise stated herein.
- C. Place asphalt within 24 hours of applying primer or tack coat.
- D. Place thickness as indicated on Civil Drawings to minimum 1 inch compacted thickness.
 - 1. Asphalt concrete work shall include full depth patching and variable thick asphalt concrete transition areas.
 - 2. Provide daily the Inspector, with copies of certificates of weight for all materials delivered to the job site and/or incorporated in the work.
 - 3. At no time shall the coarse aggregate that has segregated from the mix be scattered across the paved mat.
- E. Install gutter drainage grilles and frames and manhole frames in correct position and elevation.
- F. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position.
 - 1. Compact (roll) asphaltic concrete in accordance with SSPWC (Greenbook), Subsection 302-5.6, using machine rollers.
 - a. Compaction by vehicular traffic is prohibited.
 - b. Compact areas inaccessible to rolling equipment with machine-powered tamper.
- G. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.10 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

- A. Provide at least two courses of asphalt when Type D2 asphalt pavement is greater than 1-1/2 inches. The surface course shall be a minimum thickness of 1 inch and a maximum of 1-1/2 inches.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Asphalt Paving 32 12 16 - 8
---	--	--------------------------------

- B. Provide at least two courses of asphalt when Type C2 asphalt pavement is greater than 3 inches. The surface course shall be a minimum thickness of 1 inch and a maximum of 2 inches.
- C. Install Work in accordance with ASTM F588 Subsection 302-5.
- D. Place asphalt binder course within 24 hours of applying primer or tack coat.
- E. Place binder course to thickness as indicated on Civil Drawings, minimum 1 inch compacted thickness.
- F. Place wearing course within two hours of placing and compacting binder course.
- G. Place wearing course to thickness as indicated on Civil Drawings, minimum 1 inch compacted thickness.
- H. Install gutter drainage grilles and frames and manhole frames in correct position and elevation.
- I. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position.
 - 1. Compact (roll) asphaltic concrete in accordance with SSPWC (Greenbook), Subsection 302-5.6, using machine rollers.
 - a. Compaction by vehicular traffic is prohibited.
 - b. Compact areas inaccessible to rolling equipment with machine-powered tamper.
- J. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.11 SEAL COAT

- A. Apply seal coat after surface course application, in accordance with manufacturer's recommendations.
- B. Apply seal coat to surface course and asphalt curbs in accordance with § 302-8.2.
- C. Add water to specified seal coat material. When air temperatures of 90 degrees F or more are encountered during application, consult manufacturer for recommendations.
- D. If pavement surface exhibits imperfections of roller marks, rock pockets, ridges or depressions as determined by the Architect, the addition of sand aggregate to seal coat, and amounts thereof, shall be as recommended by the manufacturer.
- E. A second application shall be made after first coat has dried to the touch. When sand is added to the first seal coat, two additional coats without extra sand shall be applied.
- F. Allow seal coat to dry before permitting traffic or striping.

3.12 PAVEMENT REPAIR AND PAVING

- A. Preparation of existing pavement: Where indicated, remove loose asphaltic concrete, cleanout "pot holes" and cracks, remove dirt, oil and other foreign materials.
- B. Repair holes with full paving section as specified. Repair "alligatoring" with asphalt "skin-patch". Fill all cracks larger than 1/4 inch wide with asphalt emulsion slurry.
- C. Repair of Existing Surfacing:

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Asphalt Paving 32 12 16 - 9
---	--	--------------------------------

1. Fill cracks 1/2 inch wide and less with RS-1 emulsion and silica sand or other required material.
 2. Cracks larger than 1/2 inch wide shall be filled with Type C2 Asphalt Concrete as specified.
 - a. Cracks shall be filled to the level of adjacent surfacing.
 3. Where low areas, holes, or depressions occur in existing surfacing, repair with emulsified asphalt.
 - a. Install material, strike off the emulsified asphalt with a straightedge flush with adjoining surfacing.
 - b. Finish with a steel trowel, and after dehydration, compact by rolling or tamping.
- D. Tack Coat: Apply asphalt oil AR-4000 or AR-8000, as required for jobsite condition, at metered application rate of no less than a range from 0.2 to 0.3 gallons per square yard of fabric or as directed by manufacturer and to provide 100 percent fabric saturation and ample bonding for paving section.
- E. Fabric Reinforcement: Place fabric smooth side up in tack coat with 2 to 4 inch overlap. Hand-broom to remove wrinkles. Apply addition tack coat to joints and between overlapped fabric layers.
- F. Overlay Asphalt: Place single course asphalt, 1-1/2 inch compacted thickness, in conformance with specified standards in this section.

3.13 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Compacted Thickness: Within 1/4 inch of specified or indicated thickness.
- C. Variation from True Elevation: Within 1/2 inch.

3.14 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for quality control.
- B. Provide field inspection and testing. Take samples and perform tests in accordance with AI MS-2.
 1. Flood test entire area in presence of the Project Inspector.
 2. Entire area tested to be free of standing water or puddles.
- C. Pavement at all longitudinal joints shall have a Field Density of 95%, as described in SSPWC (Greenbook), Section 302-5.6.2.
 1. When the test results of the field cores are less than 95% Relative Compaction, remove a 1 foot wide section on each side of the longitudinal joint.
 2. Replace the removed pavement with an asphalt mix that meets the job specification at no additional cost to the District.
- D. Test: Flood test all paving to demonstrate positive drainage.
 1. Before acceptance, water test all pavements to ensure proper drainage as directed by the Inspector.
 2. The Contractor shall provide water for this purpose.

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Asphalt Paving 32 12 16 - 10
---	--	---------------------------------

3. Flooding Method: By water tank truck.
4. Fill depressions where the water ponds to a depth of more than 1/8 inch; or the slope corrected to provide proper drainage.
5. The edges of the fill shall be feathered and smoothed so that the joint between the fill and the original surface is invisible.
6. No standing water shall remain 1-hour after test.
7. Full compensation for complying with this requirement shall be considered as included in the Contract Unit Price for Asphalt Paving.

3.15 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury for 2 days or until surface temperature is less than 140 degrees F.
 1. After final rolling, prohibit all traffic on asphaltic concrete until mix has fully cooled and set. Minimum time, in all cases shall be 6 hours.

3.16 CLEANING

- A. After completion of paving operations, clean all existing and new improvements that have been soiled, especially by oil tracking from asphalt tanks or placement in general.
- B. For Substantial Completion review, broom clean and wash paving with hoses. Clean residue from landscaping installation.

END OF SECTION

Magnolia Elementary School Relocatable Classroom Buildings RCA Project No. 1-16-02		Asphalt Paving 32 12 16 - 11
---	--	---------------------------------