



CONTRACT DOCUMENTS

FOR

LAKESIDE EQUESTRIAN FACILITY

PROJECT NO. 1020367

REQUEST FOR BID NO. 10161

ONSITE PRE-BID CONFERENCE: 3/17/20, 8:00am-9:00am

BID OPENING DATE: 3/30/20

SPECIAL NOTICES

Disabled Veterans Business Enterprise (DVBE): Attention is directed to pages 1-18 through 1-20 of the contract documents concerning DVBE participation. These pages contain specific requirements for either meeting an established participation requirement of 3% or a Good Faith Effort (GFE). As a general statement, GFE submittals must include required individual solicitations of DVBE firms and appropriate supporting documentation.

Addenda and Interpretations: The Owner will not be responsible for any oral interpretation of the meaning of the plans, specifications, or other pre-bid documents. Every request for such interpretation shall be in writing and forwarded via email to PCO Veronica.Ford@sdcounty.ca.gov be given consideration must be received at least ten (10) days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be posted on the County BuyNet website at <https://buynet.sdcounty.ca.gov>. It is the responsibility of all prospective bidders to check the County BuyNet website for any updates to contract documents. All addenda so issued shall become part of the Contract Documents.

Plan Holders List: All interested parties who would like to be placed on the plan holders list, please submit your information (company name, contact person, general or sub, address, phone and fax) in its entirety to PCO Veronica.Ford@sdcounty.ca.gov on or before the due date for all RFIs. Plan holders list will be posted on BuyNet labeled "plan holders list" as a courtesy and is not a requirement of this solicitation. The County of San Diego makes no representation as to the accuracy or for the completeness of the plan holders list.



COUNTY OF SAN DIEGO
DEPARTMENT OF PARKS AND RECREATION
5500 OVERLAND AVENUE, SUITE 410
SAN DIEGO, CALIFORNIA 92123-1061

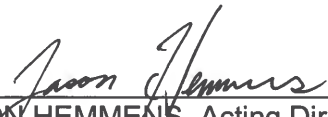
CONTRACT DOCUMENTS FOR CONSTRUCTION
LAKESIDE EQUESTRIAN FACILITY
ORACLE PROJECT NO. 1020367
REQUEST FOR BID NO. **10161**

BID OPENING DATE: **3/30/2020**

Any questions relative to this project, prior to execution of the Contract, should be directed to:

Veronica Ford, Procurement Contracting Officer
Email: Veronica.Ford@sdcounty.ca.gov

RECOMMENDED BY:



JASON HEMMENS, Acting Director
Department of Parks and Recreation



Date

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CONSTRUCTION OF
LAKESIDE EQUESTRIAN FACILITY
ORACLE PROJECT NO. 1020367

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PART I

BIDDING INFORMATION

NOTICE TO CONTRACTORS INVITING BIDS

The County of San Diego, Owner, invites sealed bids for:

CONSTRUCTION OF LAKESIDE EQUESTRIAN FACILITY ORACLE PROJECT NO. 1020367 REQUEST FOR BID NO. 10161

Submit to the County of San Diego, Department of Purchasing and Contracting, Front Desk (where it will be time stamped to indicate time of receipt), 5560 Overland Avenue, Suite 270, San Diego, CA 92123 in a sealed envelope or package clearly marked on the exterior with "**RFB 10161**" and the name and address of the offeror prior to **2:00 PM**, Local Time on **3/30/20**. Parking is limited, so be sure to deliver your bids early.

Late submission cannot be considered unless there was mishandling on the part of the County of San Diego purchasing staff. Submittals must be received at the Purchasing and Contracting front counter by the identified date and time. If utilizing a courier service or USPS, be advised that all courier service deliveries, including USPS, might be delivered to the County's central mail room, which may result in late submission and rejection of your bid.

A pre-bid meeting is scheduled for **3/17/20, 8:00am to 9:00am**, 11055 Moreno Avenue, Lakeside, CA 92040 at proposed project site.

The Contractor shall possess, at the time of submitting the bid, a California contractor's license, Classification A, General Engineering Contractor.

In accordance with Board of Supervisors Policy "B-39a", a Disabled Veterans Business Enterprise (DVBE) participation of three percent (3%) is required for a public work project that is estimated (by the County) to exceed \$1 million. A good faith effort cannot be accepted in lieu of meeting the 3% requirement. Should the lowest prime contractor not meet the 3% requirement, the next lowest responsible and responsive bidder that complies with the DVBE requirement will be awarded the contract.

For a public work project that is estimated (by the County) to be between \$500,000 and \$1 million, all bidders are required to make a good faith effort to meet-or-exceed a 3% DVBE subcontractor participation. The Good Faith Effort shall be documented demonstrating all participation was obtained prior to bid submittal.

For a public work project estimated (by the County) to be less than \$500,000, DVBE participation is encouraged, but not required. DVBE participation may be documented on page 2-10 but is not required at this estimate level.

The project is located at 11055 Moreno Avenue, Lakeside, CA 92040.

Work to be done includes, in general, furnish all labor, equipment and materials for the base bid and additive alternates as indicated below and in the construction documents. Bid documents include a Civil drawing set and a Building drawing set. The Civil drawing set includes site improvements, utilities, planting and irrigation. The Building drawing set includes pre-engineered structure drawings and site amenity information. Both drawing sets organize the project site by area numbers 1 through 6 and then by amenity item numbers within areas. This numbering system is coordinated throughout the drawing sets and used to describe the base bid and additive alternates below.

See exhibits illustrating base bid and additive alternates following Part I.

See Specification Section 01 20 00 – Measurement and Payment for payment schedule, bid item descriptions.

Base Bid:

Construction of a covered arena (Area 1 on plans) equipped with a pre-engineered roof structure (Item 1.0 on plans), arena fencing and chutes with industrial material wrap (Item 1.9 on plans), and improvements associated with the covered arena including, but not limited to, lighting, ceiling fans, bleachers with storage (Item 1.7 on plans), electronic scoreboard with timing eye (Item 1.6 on plan), electronic public address system, and patio area with picnic tables (Item 1.8 on plans). Construction of a pre-engineered shop/storage building (Item 4.1 on plans), sections of fencing and gates, and a County monument sign (Item 6.3 on plans). Construction of site work to support the improvements including demolition, grading, erosion control, drainage, water quality and storm water best management practices, an all-way stop at existing intersection, two driveways, day use area (Area 5 on plans), and temporary surfacing. Construction of utilities to support the base bid improvements including fire hydrant, fire sprinklers, portion of potable water, portion of electric, and portion of parking lot solar lighting.

Additive Alternate 1:

Construction of a pre-engineered meeting room/ kitchen building with concession equipment (Item 1.1 on plans), pre-engineered restroom building (Item 1.2 on plans), and a pre-engineered dumpster enclosure (Item 1.3 on plans) with concrete pad. Construction of site work to support Additive Alternate 1 improvements including temporary surfacing. Construction of utilities including sewer, gas, portion of water, and fire sprinklers to support Additive Alternate 1 improvements.

Additive Alternate 2:

Construction of host pad with pre-engineered shade structure and fencing (Item 4.2 on plans), overnight recreational vehicle parking area with utility hook-ups (Item 4.3 on plans), horse corrals, heated equestrian wash racks (Item 4.4 on plans), and a pre-engineered shade structure with picnic tables in the day use area (Item 5.1 on plans). Construction of announcers' booth (Item 1.4 on plans) in the covered arena. Construction of site work to support Additive Alternate 2 improvements. Construction of utilities including sewer, gas, portion of water, portion of electric, and portion of parking lot solar lighting.

Additive Alternate 3:

Construction of all irrigation and planting, and remainder decorative peeler pole fencing. Construction of site work to support Additive Alternate 3 improvements including final surfacing of the southerly two-thirds of the project site. Construction of utilities to support Additive Alternate 3 improvements including portion of parking lot solar lighting.

Additive Alternate 4:

Construction of an outside equestrian arena (Area 2 on plans) equipped with arena fencing and chutes (Item 2.6 on plans), bleachers (Item 2.2 on plans) with a pre-engineered shade structure (Item 2.1 on plans), pre-engineered announcers' booth (Item 2.3 on plans) and viewing box (Item 2.4 on plans), electronic scoreboard with timing eye (Item 2.5 on plans), and electronic public address system. Construction of livestock corrals (Area 3 on plans) with a pre-engineered shade structure (Item 3.1 on plans), cattle alley (Item 3.4 on plans), and manure compost bins (Item 3.2 on plans). Construction of site work to support the Additive Alternate 4 improvements including final surfacing of the northerly most one-third of the project site. Construction of utilities to support Additive Alternate 4 improvements including portion of electric, portion of water, water truck filling station (Item 3.3 on plans), and portion of parking lot solar lighting.

BID SCHEDULE (Includes Materials & Installation):**BASE BID**

No.	Description	Estimated Qty	Unit of Measure
Mobilization & Contractor's Facilities			
1	Mobilization	1	LS
2	Temporary Site Utilities - Water & Power	1	LS
3	Temporary Sanitary Facilities	1	LS
4	SWPPP Program Requirements & BMPs	1	LS
5	Construction Survey Staking	1	LS
Civil/Sitework - Demolition			
6	Demo – Appurtenances	1	LS
7	Demo – Perimeter Fencing	4,540	LF
8	Demo – Utilities	1	LS
Civil/Sitework - Intersection Plan			
9	R1 'STOP' and R1-3 'ALL WAY' Signs & Posts	3	EA
10	12" White Limit Line per CALTRANS Std. Plan A24E	4	EA
11	"STOP" Marking per CALTRANS Std. Plan A24D	6	EA
12	Type IV(L) Arrow per CALTRANS Std. Plan A24A	3	EA
13	8" Wide White Stripe per Plan A20D / Detail 38A	50	LF
14	W17 ' STOP AHEAD' Sign	2	EA
15	AHEAD' Marking per CALTRANS Std. Plan A24D	2	EA
16	Dashed 6" White Line per CALTRANS Std. Plan A20D / Detail 39A	98	LF
17	Removal of Conflicting Markings, Sandblasting/Grinding and Sand Sealing	1	LS
18	6" Yellow Line per Plan A20A / Detail 22	540	LF
Civil/Sitework - Site Improvements			
19	6' Vinyl-Coated Chain-Link Fence per SDRSD M-06 (Site Perimeter)	2,945	LF
20	6'x25' Vinyl-Coated Chain-Link Gate per SDRSD M-05 with Fire Dept. Lock (Main & South)	2	EA
21	County of San Diego Day Use Sign	1	LS
22	Peeler Pole Fence - Base Bid	552	LF
23	County of San Diego Entrance Monument Sign	1	LS
Civil/Sitework - Grading Plan			
24	Earthwork - Clear & Grub including Disposal of Vegetation Off-Site	14	ACRE
25	Earthwork - Grading - CUT	23,200	CY
26	Earthwork - Grading - FILL	17,000	CY

27	Earthwork - Grading - NET SURPLUS (Haul Off Site)	6,287	CY
28	Public Trail 4" D.G. - Rough/Fine Grading	14,985	SF
29	Public Trail - Import 4" D.G., Place, Grade & Compact	185	CY
30	Temporary Parking Lot Surfacing - Rough/Fine Grading	374,693	SF
31	Temporary Parking Lot Surfacing - Import & Compact 2" DG & 2" AB	4,626	CY
32	Minor Concrete - Main Driveway Concrete SOG	1	LS
33	Minor Concrete - South Gate Driveway Concrete SOG	1	LS
34	Minor Concrete - Helix Easement Overlay 9" Concrete SOG	1	LS
35	Minor Concrete - Type A Curb Ramp per SDRSD G-27	1	EA
36	Minor Concrete - Type B Curb Ramp per SDRSD G-27	1	EA
Civil/Sitework - Biofiltration Basins and Other Site Improvements Including Drainage Control Facilities			
37	Biofiltration Basin 1:		
38	24"x6'-0" PVC Riser with PVC Trash Rack	1	EA
39	3/4"-2" Clean Angular Gravel (18" Layer)	246	CY
40	8" PVC Perforated Subdrain with Cleanout & Cap	828	LF
41	Pea Gravel (4"-6" Layer)	82	CY
42	Permeable Media (18" Layer)	246	CY
43	10" PVC Solid Overflow Pipe	76	LF
44	Aged Non-Floatable Hardwood Mulch (3" Layer)	41	CY
45	Biofiltration Basin 2:		
46	24"x6'-0" PVC Riser with PVC Trash Rack	1	EA
47	3/4"-2" Clean Angular Gravel (18" Layer)	88	CY
48	8" PVC Perforated Subdrain with Cleanout & Cap	50	LF
49	Pea Gravel (4"-6" Layer)	30	CY
50	Permeable Media (18" Layer)	88	CY
51	10" PVC Solid Overflow Pipe	79	LF
52	Aged Non-Floatable Hardwood Mulch (3" Layer)	15	CY
53	Biofiltration Basin 3:		
54	24"x6'-0" PVC Riser with PVC Trash Rack	2	EA
55	3/4"-2" Clean Angular Gravel (18" Layer)	282	CY
56	8" PVC Perforated Subdrain with Cleanout & Cap	177	LF
57	Pea Gravel (4"-6" Layer)	94	CY
58	Permeable Media (18" Layer)	282	CY
59	12" PVC Solid Overflow Pipe	97	LF
60	Aged Non-Floatable Hardwood Mulch (3" Layer)	47	CY
61	Site Drainage Improvements:		
62	Apron East Side 7" Concrete Lining	18	CY
63	Low Flow Channel 7" Concrete-Lined	96	CY
64	Concrete-Lined Swale (Northeast)	27	CY
65	Box Culvert Complete	1	LS
66	Rip-Rap, Class No. 2 Backing, 1.5' Thick (approx. 2,500 SF) - South Side	123	CY

67	Rip-Rap, Class No. 2 Backing, 1.5' Thick (approx. 2,000 SF) - Southeast Curve	115	CY
68	Rip-Rap, Class No. 2 Backing, 1.5' Thick (approx. 1,000 SF) - East Side	49	CY
69	Rip-Rap, Class No. 2 Backing, 1.5' Thick (approx. 1,000 SF) - Southwest Corner	37	CY
Civil/Sitework - Site Utilities			
70	Fire Water System:		
71	6" PVC C-900 Class-200 Pipe	900	LF
72	6" DI MJ 90 Ell - Epoxy Lined & Coated w/Accessories	1	EA
73	6" DI MJ 45 Ell - Epoxy Lined & Coated w/Accessories	2	EA
74	6" DI MJ Tee - Epoxy Lined & Coated w/Accessories	2	EA
75	6" Flex Coupling - Epoxy Lined & Coated w/Accessories	2	EA
76	Fire Hydrant Assembly	1	LS
77	Fire Service Backflow Preventer Assembly	1	LS
78	Connections - 6" PVC to 8" ACP (Lakeside Irrigation District)	1	LS
79	Connections - 6" Meter Assembly with Concrete Pad	1	LS
Civil/Sitework - Erosion Control Plan			
80	SC-05 Fiber Rolls with Staking - Biofiltration Basin 1	519	LF
81	SC-05 Fiber Rolls with Staking - Biofiltration Basin 2	181	LF
82	SC-05 Fiber Rolls with Staking - Biofiltration Basin 3	335	LF
83	SC-04/06 Gravel Bag Berm (Check Dam and Inlet Protection)	333	LF
84	SC-01 Silt Fence with Staking	3,077	LF
85	TC-01 Construction Entrance/Exit with Rattle Strips	2	EA
Civil/Sitework - Sump Pump Station at Biofiltration Basin No. 2			
86	Sump Pump Assembly	1	LS
Site - Electrical			
87	SDG&E Service Planning & Permitting Fees	1	LS
88	Primary Conduit Duct Bank from Existing SDG&E Point of Connection to Transformer Pad	1	LS
89	Utility Transformer Concrete Pad (Assume Transformer by SDG&E) Including Grading & Precast Concrete Pad	1	LS
90	Service Meter Switchboard 'MSB' Concrete Pad/Foundation	1	LS
91	Service Meter Switchboard 'MSB' Grounding	1	LS
92	Service Meter Switchboard 'MSB' 600A, 120/208V, NEMA 3R	1	LS
93	Panel 'A' 200A - Covered Arena	1	LS
94	Panel 'A1' 200A - Covered Arena	1	LS
95	Panel 'E' 200A - Shop Building	1	LS
96	Panel 'LCP' 15A - Duplex Sump Pump Local Control Panel	1	LS
97	Pole-Mounted Light Fixtures - P1 LED Solar-Powered Area Light Fixture (5230 Lumens) - Carmanah EC-340-5230	1	EA
98	Pole-Mounted Light Fixtures - P3 LED Solar-Powered Area Light Fixture (6060 Lumens) - Carmanah EC-340-6060	5	EA

99	24"x8'-0" Light Pole Reinforced Concrete Bases w/Anchor Bolts	6	EA
100	Concrete Pull Boxes (PB-1 through PB-3) - 2'x3' with Galv Steel H20-Loading Bolt-Down Cover & SS Bolts	3	EA
101	Duct Bank PB-1 to PB-3 including Conduit, Spacers, Encasement, Wire	433	LF
Area 1 Improvements - Covered Arena			
102	1.1 Structure - Column Footings/Foundations - Excavation, Form, Rebar, Set Anchor Bolts, Backfill, Ready for Building CONTRACTOR ALLOWANCE	1	LS
103	1.1 Structure - Pre-Engineered Metal Building (incl. Sales Tax & Freight)	1	LS
104	1.1 Structure - Pre-Engineered Metal Building (Installation)	1	LS
105	1.6 Electronic Scoreboard	1	LS
106	1.7 Bleachers	1	LS
107	1.7 Bleachers Concrete Pad/Foundation/Walkways	1	LS
108	1.8 Patio Area	1	LS
109	1.9 Arena Fencing, Gates & Chutes (Kovac Ranch Equipment)	1	LS
110	Arena Equipment – Footing Material - Import, Place and Compact	1	LS
111	Arena Equipment - Electronic Public Address System	1	LS
112	Lighting - LED High-Bay Luminaire Pendant-Mounted - Litetronics HB220W140DL	96	EA
113	Lighting - Conduit, Wire, Hangers, J-Boxes and Misc.	1	LS
114	Lighting - Spare Conduit Below Surface	1	LS
115	Lighting - 0-10VDC Lighting Dimmer Controls Station	1	EA
116	Lighting - Ceiling Fan Controls Station	1	EA
117	Electrical Terminations, Ring-Out, Testing & Misc.	1	LS
118	Fire Protection - Sprinkler System including Fire Riser	540	HEADS
119	HVAC - Ventilation Fans and Control System	8	EA
Area 4 Improvements - Warm-Up Area			
120	4.1 Shop / Storage Pre-Engineered Structure including SOG and Single-Story PEMB	1	LS
121	4.1 Shop / Storage Pre-Engineered Structure FF&E (Furnished and Installed)	1	LS
122	4.1 Shop / Storage Structure - Utility Connections to Building	1	LS
123	4.1 Shop / Storage Structure - Misc. Concrete Exterior Slabs at Garage Entrances	1	LS
Area 5 Improvements - Day Use Area / Trail Staging Area			
124	5.2 Picnic Tables (Area 5)	4	EA
125	5.3 Trash Bin for Horse Manure (Area 5)	1	EA
126	Horse Hitch (Area 5)	1	EA
127	Water Spigot (Including Potable Water Plumbing from Underground System)	1	EA

128	Plumbing - Exterior Water Connection	1	LS
Project Close-Out			
129	Testing, Start-Up and Commissioning (All Facilities)	1	LS
130	Special Final Inspections / Inspection Participation (County, SDG&E and Others)	1	LS
131	Spare Parts, Lubricants, Oils and Other Special Tools and Materials	1	LS
132	O&M Manuals & Warranties	1	LS
133	All Project Completion Documents (As-Built Drawings, Schedules, Test Reports)	1	LS
134	Cleanup and Demobilization	1	LS

ADDITIVE ALTERNATE 1

No.	Description	Estimated Qty	Unit of Measure
Civil/Sitework - Grading Plan			
135	Minor Concrete - Kitchen Pad 9" Concrete SOG & Parking Area	1	LS
136	Minor Concrete - Restrooms Pad 9" Concrete SOG & Parking Area	1	LS
137	Minor Concrete - Dumpster Pad 9" Concrete SOG & Parking Area	1	LS
Civil/Sitework - Site Utilities			
138	Potable Water System:		
139	4" PVC C-900 Class-200 Pipe	1,674	LF
140	4" DI MJ 90 Ell - Epoxy Lined & Coated w/Accessories	3	EA
141	4" DI MJ 45 Ell - Epoxy Lined & Coated w/Accessories	1	EA
142	4" DI MJ Tee - Epoxy Lined & Coated w/Accessories	5	EA
143	4" Flex Coupling - Epoxy Lined & Coated w/Accessories	4	EA
144	4" PVC to 8" ACP (Lakeside Irrigation District)	1	LS
145	4" Meter Assembly with Concrete Pad, Valves, Bollards and Painting	1	LS
146	Water Service Backflow Preventer Assembly	1	LS
147	Encase in Red Concrete Over Helix Water District Easement	1	LS
148	Sanitary Sewer System:		
149	6" PVC SDR-35 Gravity Sewer Pipe	1,080	LF
150	6" PVC SDR-35 Gravity Sewer 45 Ell	2	EA
151	6" PVC SDR-35 Gravity Sewer Wye	2	EA
152	6" PVC SDR-35 Sewer Pipe Cleanout Assembly including Box & Cover	3	EA
153	6" Flex Coupling - Epoxy Lined & Coated w/Accessories	3	EA

154	Connections - 6" PVC to Existing SDRSD Sewer with SS-04 Connection & SC-01 Cleanout	1	LS
155	Natural Gas System:		
156	2" Polyethylene Gas Piping/Flex Tubing per Local Codes	620	LF
157	Connections - 2" Gas Service Connection & Fees including Metering	1	LS
158	Gas Line Connection to Main	1	LS
159	Encase in Red Concrete Over Helix Water District Easement	1	LS
Site - Electrical			
160	Panel 'B' 100A - Kitchen / Meeting Room Building	1	LS
161	Panel 'D' 50A - Restrooms Building	1	LS
Area 1 Improvements - Covered Arena			
162	1.4 Pre-Engineered Announcer's Booth Structure	1	LS
163	1.4 Pre-Engineered Announcer's Booth - FF&E (Furnished and Installed)	1	LS
Area 4 Improvements - Warm-Up Area			
164	1.2 Meeting Room / Kitchen Pre-Engineered Structure	1	LS
165	1.2 Meeting Room / Kitchen - FF&E (Furnished and Installed)	1	LS
166	1.3 Restroom Pre-Engineered Structure	1	LS
167	1.3 Restroom - FF&E (Furnished and Installed)	1	LS
168	1.4 Dumpster Trash Enclosure - Pre-Engineered Structure	1	LS
169	1.4 Dumpster Trash Enclosure – FF&E (Furnished and Installed)	1	LS

ADDITIVE ALTERNATE 2

No.	Description	Estimated Qty	Unit of Measure
Site – Electrical			
170	Panel 'RV' 30A & 50A - RV Parking Power Pedestals	5	LS
171	Panel 'HOST' 50A - Host Pad RV Power Pedestal	1	LS
172	Pole-Mounted Light Fixtures - P1 LED Solar-Powered Area Light Fixture (5230 Lumens) - Carmanah EC-340-5230	3	EA
173	Pole-Mounted Light Fixtures - P3 LED Solar-Powered Area Light Fixture (6060 Lumens) - Carmanah EC-340-6060	8	EA
174	24"x8'-0" Light Pole Reinforced Concrete Bases w/Anchor Bolts	11	EA
Area 4 Improvements - Warm-Up Area			
175	4.3 Host Pad - 50'x50' Concrete Pad/Foundation	1	LS
176	4.3 Host Pad - 50'x50' Pre-Engineered Shade Structure (Includes Installation)	1	LS

177	4.4 RV Hook-Up Pedestal Connections (Water, Sewer and Power)	5	EA
178	4.5 Heated Wash Racks (Including Misc. Metals & Plumbing)	2	LS
179	Corrals (10'x10', Corral Fencing & Gates with Concrete Footings)	5	EA
Area 5 Improvements - Day Use Area / Trail Staging Area			
180	5.1 Pavilion - Concrete Pad/Foundation	1	LS
181	5.1 Pavilion – Pre-Engineered Shade Structure	1	LS
182	5.1 Pavilion – Pre-Engineered Shade Structure Installation	1	LS

ADDITIVE ALTERNATE 3

No.	Description	Estimated Qty	Unit of Measure
Civil/Sitework - Site Improvements			
183	Grand Entrance Gateway & Sign	1	EA
184	<u>DEDUCT</u> : 6'x25' Vinyl-Coated Chain-Link Gate per SDRSD M-05 with Fire Dept. Lock (Main Gate replaced by Grand Entrance Sign)	1	EA
185	Peeler Pole Fence - East Side	1,140	LF
186	Peeler Pole Fence - Biofiltration Basin 1 Perimeter	521	LF
187	Peeler Pole Fence - Biofiltration Basin 2 Perimeter	207	LF
188	Peeler Pole Fence - Biofiltration Basin 3 Perimeter (2 Sides Only)	188	LF
189	Peeler Pole Fence - South Side Public Trail	900	LF
190	Peeler Pole Fence - South Side Equestrian Trail	691	LF
191	Peeler Pole Fence - West Side Equestrian Trail	815	LF
192	Peeler Pole Fence (Tree Guards)	352	LF
Civil/Sitework - Grading Plan			
193	Final Parking Lot Surfacing - Rough/Fine Grading	230,467	SF
194	Final Parking Lot Surfacing - Import & Compact Additional 2" DG & 4" AB	4,268	CY
Site - Irrigation & Landscaping			
195	Irrigation Systems:		
196	Hot Tap Connection Service	1	LS
197	1" Potable Irrigation Meter and Installation	1	LS
198	1" Backflow Preventer on Concrete Pad	1	LS
199	Backflow Preventer Enclosure	1	LS
200	1" Master Valve	1	EA
201	1" Flow Meter	1	EA
202	Calsense Irrigation Controller, Conventional, 24 Sta.	1	EA
203	Rain Shut Off Device and Enclosure	1	EA

204	Pressure Mainline 1.5"	2,002	LF
205	Pressure Mainline 1"	275	LF
206	Quick couplers for hand watering and wash down.	11	EA
207	Shrub Bed and Basin Irrigation	23,842	SF
208	Drainage Channel Irrigation	14,840	SF
209	Tree Bubblers	106	EA
210	1" Meter Capacity Fee - Lakeside Water District	1	EA
211	1" Meter Capacity Fee – SDCWA	1	EA
212	Water District Plan Check Fees	1	EA
213	Landscape / Planting:		
214	36" Box Trees	27	EA
215	24" Box Trees	9	EA
216	15 Gallon Trees	11	EA
217	5 Gallon Shrubs	128	EA
218	1 Gallon Shrubs	552	EA
219	Boulders	108	EA
220	River Cobble	1,920	SF
221	Hydroseed	32,619	SF
222	Fine Grading Landscape Areas	28,705	SF
223	Bark Mulch Shrub Beds (not bio-basins)	10,737	SF
224	Root Barriers	565	LF
225	Landscape Maintenance Period	3	MO
226	Grass-Lined Channel	32,619	SF
Site – Electrical			
227	Pole-Mounted Light Fixtures - P1 LED Solar-Powered Area Light Fixture (5230 Lumens) - Carmanah EC-340-5230	1	EA
228	Pole-Mounted Light Fixtures - P2 LED Solar-Powered Area Light Fixture (4480 Lumens) - Carmanah EC-340-4480	3	EA
229	Pole-Mounted Light Fixtures - P3 LED Solar-Powered Area Light Fixture (6060 Lumens) - Carmanah EC-340-6060	2	EA
230	24"x8'-0" Light Pole Reinforced Concrete Bases w/Anchor Bolts	6	EA

ADDITIVE ALTERNATE 4

No.	Description	Estimated Qty	Unit of Measure
Civil/Sitework - Grading Plan			
231	Final Parking Lot Surfacing - Rough/Fine Grading	53,680	SF
232	Final Parking Lot Surfacing - Import & Compact Additional 2" DG & 4" AB	994	CY
233	Minor Concrete - Type B Curb Ramp per SDRSD G-27	1	EA

Civil/Sitework - Site Utilities			
234	4" PVC C-900 Class-200 Pipe	2,253	LF
235	4" DI MJ 90 Ell - Epoxy Lined & Coated w/Accessories	4	EA
236	4" DI MJ 45 Ell - Epoxy Lined & Coated w/Accessories	1	EA
237	4" DI MJ Tee - Epoxy Lined & Coated w/Accessories	4	EA
238	4" Flex Coupling - Epoxy Lined & Coated w/Accessories	3	EA
Site – Electrical			
239	Pole-Mounted Light Fixtures - P1 LED Solar-Powered Area Light Fixture (5230 Lumens) - Carmanah EC-340-5230	5	EA
240	Pole-Mounted Light Fixtures - P2 LED Solar-Powered Area Light Fixture (4480 Lumens) - Carmanah EC-340-4480	-	EA
241	Pole-Mounted Light Fixtures - P3 LED Solar-Powered Area Light Fixture (6060 Lumens) - Carmanah EC-340-6060	-	EA
242	24"x8'-0" Light Pole Reinforced Concrete Bases w/Anchor Bolts	5	EA
243	Concrete Pull Boxes (PB-4 through PB-9) - 2'x3' with Galv Steel H20-Loading Bolt-Down Cover & SS Bolts	6	EA
244	Duct Bank PB-3 to PB-9 including Conduit, Spacers, Encasement, Wire	1,450	LF
Area 2 Improvements - Outside Arena			
245	2.1 Bleachers – Pre-Engineered Shade Structure (Including Installation)	1	LS
246	2.2 Bleachers	1	LS
247	2.2 Bleachers Concrete Pad/Foundation	1	LS
248	2.3 Announcers Booth – Pre-Engineered Structure	1	LS
249	2.3 Announcers Booth – FF&E (Furnished and Installed)	1	LS
250	2.4 Covered Viewing Box – Pre-Engineered Structure	1	LS
251	2.4 Covered Viewing Box – FF&E (Furnished and Installed)	1	LS
252	2.5 Electronic Scoreboard	1	LS
253	2.6 Arena Fencing & Equip. – Fencing & Gates (Kovac Ranch Equipment)	1	LS
254	Arena Equip. – Footing Material - Import, Place and Compact	1	LS
255	Light Fixtures, Conduit, Wire, Subpanels/Disconnects, Grounding	1	LS
256	Water Spigots (Including Potable Water Plumbing from Underground System)	5	EA
257	Electronic Public Address System	1	LS
Area 3 Improvements - Livestock Corrals			
258	3.1 Livestock Corrals Pre-Engineered Alley Shade Structure (with installation)	1	LS
259	3.2 Covered Compost Area (6 Bins)	1	LS
260	3.3 Water Truck Filling Station	1	LS
261	3.4 Cattle Alley (Kovac Ranch Equipment)	1	LS
262	Feeder Troughs (Galv Steel Troughs)	4	EA

263	Water Trough with Automatic Float Valve	4	EA
264	Water Spigots (Including Potable Water Plumbing from Underground System)	5	EA
265	Livestock Corrals - Fencing, Gates & Chutes (Kovac Ranch Equipment)	1	LS

The Contractor is responsible to field verify all measurements prior to bid. No additional compensation will be provided. It is the intent of this bid schedule to include **ALL** Work in all divisions and sections of this specification. Specification references are provided as a courtesy and should not be fully relied on.

Contract Documents, including plans, specifications, materials report and bid forms are available to be downloaded, free of charge, from the Department of Purchasing and Contracting BuyNet website at: <https://buynet.sdcounty.ca.gov>.

Full-size plans for this project are not available for purchase.

Firms Associated with Project: The County of San Diego engaged the following Architect-Engineering firm with its subcontractors, or other firms to provide the Plans, Specifications, and other related supporting technical documents or services for this construction procurement.

Kleinfelder, Inc.
550 West C St. Suite 1200
San Diego, CA 92103

The firms listed above have been associated with this project and are provided for informational purposes only. This list is not intended to be relied on for purposes of compliance with any conflict of interest rules or applicable laws or regulations affecting the project. The Contractor is solely responsible for due diligence in identifying and avoiding all potential conflicts of interest related to contracting for, and construction of, this project.

The Standard Specifications for this project are the Standard Specifications of the State of California, Department of Transportation, current edition, and Greenbook Standard Specifications for Public Works Construction, current edition, and modifications to said Standard Specifications and said Amendments contained in Part VII of these Contract Documents.

The State Department of Transportation publication "Labor Surcharge and Equipment Rental Rates" in effect the date the work is accomplished, is incorporated by reference into these Contract Documents.

Disabled Veterans Business Enterprise (DVBE) Participation: The Owner, as a matter of policy, encourages the participation of disabled veteran owned businesses. County of San Diego, Board of Supervisor DVBE policy is found at:

<http://www.sdcounty.ca.gov/cob/docs/policy/B-39a.pdf>

General Information concerning the State of California DVBE program may be found at:

<http://www.pd.dgs.ca.gov/pd>

County DVBE policy requirements shall prevail over the State of California DVBE program

requirements.

Bid Security in the form of cash, or a certified or cashier's check, or a Bidder's Bond for at least ten percent of the bid amount executed by a corporation duly authorized to issue bonds in the State of California shall accompany the bid.

Performance and Payment Bonds: The successful bidder will be required to furnish a Performance Bond for one hundred percent and a Payment Bond for one hundred percent of the Contract amount.

State Prevailing Wage Rates: This project is a "public work" in accordance with Labor Code § 1720, et seq. It is the sole responsibility of the Contractor to ensure that all workers employed in the execution of the contract are paid the correct prevailing wage rate of wages.

The Owner has obtained from the Director of the Department of Industrial Relations said Director's General Prevailing Wage Determinations for the locality in which the work is to be performed. Said determinations are on file and available for review at the Department of Purchasing and Contracting, 5560 Overland Avenue, Suite 270, San Diego, California 92123-1204 and are available from the Department of Industrial Relations at:

<http://www.dir.ca.gov/DLSR/PWD>

Not less than these rates shall be paid to all workers employed on the project.

Federal regulations and reporting requirements applicable to the proposed work must be complied with for this project.

AB 219 Notice: Ready-mix haulers and entities that deliver ready-mixed concrete to public works projects are considered subcontractors under Labor Code Section 1722.1 and must register as specified in Labor Code Section 1725.5.

SB 854 Notice: County public works projects are subject to compliance monitoring and enforcement by the Department of Industrial Relations (DIR) in accordance with Labor Code Section 1771.4(a)(1). As part of this program, Contractors and Subcontractors on Public Works Projects are required to be registered with DIR in accordance with Labor Code Section 1725.5. Unregistered contractors are not qualified to bid on, be listed in a bid proposal, listed as a Subcontractor, or engage in the performance of any Public Works Contract, all as more particularly described in Labor Code Section 1771.1(a). The prime Contractor shall be required to post the job site with all notices required by regulations per Labor Code Section 1771.4(a)(2), whether or not the County also posts.

Labor Code Compliance: Contractor shall comply with the provisions of the Labor Code requiring the payment of prevailing wages on public works, commencing with Section 1720. In accordance with Labor Code, Section 1775, the Contractor shall forfeit an amount, as determined by the Labor Commissioner, for each worker paid less than the applicable prevailing wage rate for the work or craft in which that worker is employed for any work done under Contract by Contractor or by any Subcontractor. Contractor agrees to pay the difference between the prevailing wage rate and amount paid to each worker in accordance with Labor Code, Section 1775 (a)(2)(E).

Pursuant to Labor Code, Section 1770, the Director of the Department of Industrial Relations has ascertained the general prevailing rate of per diem wages and a general prevailing rate for legal holiday and overtime work for each craft required for execution of the Contract. In accordance with Labor Code, Section 1773.2, copies of the prevailing rate of per diem wages are on file and can be viewed during normal business hours at the County Department of Purchasing and Contracting, located at 5560 Overland Avenue, Suite 270, San Diego, CA 92123-1294. Contractor shall post a copy of the applicable prevailing wage rates at the job site.

Wage rates set forth are the minimum that may be paid by the Contractor. Nothing herein shall be construed as preventing the Contractor from paying more than the minimum rates set. No extra compensation whatsoever will be allowed by the County due to the inability of the Contractor to hire labor at minimum rates, nor for necessity for payment by the Contractor of subsistence, travel time, overtime, or other added compensations, all of which possibilities are elements to be considered and ascertained to the Contractor's own satisfaction in preparing its Proposal.

If it becomes necessary to employ crafts other than those listed in the General Prevailing Wage Rate, the Contractor shall obtain a wage rate determination. The rates thus determined shall be applicable as minimum from the time of initial employment. Contractor shall be responsible for paying the applicable rate.

The Contractor and each Subcontractor shall keep and make available accurate payroll record in accordance with Labor Code, Section 1771.4(a)(3) and Section 1776. The record shall contain the names, addresses, social security numbers, work classifications, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by the Contractor and/or Subcontractor in connection with the Work. Payroll records shall be certified and shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as those forms. A copy of all payrolls shall be submitted weekly to the Engineer in accordance with Section 7-1.01A(3) "Payroll Records" of the Standard Specifications. The Contractor's and Subcontractor's certified payroll records shall be available for inspection at the principal office of the Contractor, or at the job site should the principal office be located outside of San Diego County.

Apprentices: The Contractor and each Subcontractor shall comply with the requirements of Labor Code, Section 1777.5, and any related regulations regarding the employment of registered apprentices. Properly registered apprentices shall be employed in the execution of the Work at the ratios required, but in no case shall the ratio be less than one hour of apprentice work for every five hours of journeyman work. Every apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which the apprentice is employed and shall be employed only at the work of the craft or trade to which the apprentice is registered. The Contractor shall be responsible for compliance to Labor Code, Section 1777.5 for all apprenticeable occupations. More information available at:

<http://www.dir.ca.gov/DAS/DASApprenticesOnPublicWorksSummaryOfRequirements.htm>

Contractors Licensing Laws: Attention is directed to the Contractors License Law, Section 7000 and following of the Business and Professions Code concerning the licensing of contractors. Any bidder or contractor not properly licensed may be subject to the penalties provided and will not be considered for award of this Contract. Contractors are required by law to be licensed and are regulated by the Contractors State License Board. Any questions concerning a contractor may be referred to the Registrar, Contractors State License Board, 9821 Business Park Drive, Sacramento, CA, 95827. Contractors are required to be properly licensed in California on the date bids are submitted (Bus. & Prof. Code, § 7028.15), unless federal funds are involved. If federal funds are involved, the bidder shall be properly licensed in California at the time the contract is awarded (Pub. Contract Code, § 20103.5). In this case, failure of the bidder to obtain proper and adequate licensing for an award of this Contract shall constitute a failure to execute the Contract and shall result in the forfeiture of the security of the bidder.

Bid Submittal Envelope - Each Bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, bidder's address, the name of the project for which the bid is submitted, and the appropriate State Contractor's License designation held by the bidder. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to:

**County of San Diego, Department of Purchasing and Contracting
RFB 10161 – LAKESIDE EQUESTRIAN FACILITY
5560 Overland Avenue, Suite 270
San Diego, CA 92123-1204**

It is the responsibility of the bidder to ensure the bid is submitted in proper time.

The Board reserves the right to reject any or all bids and to waive any informality or irregularity in the bids or bidding.

Withdrawal of bids shall not be permitted for a period of seventy-five (75) days after the date set for the opening thereof.

Monies withheld by the Owner to ensure performance under the Contract may be released in accordance with Public Contract Code Section 22300 and these Contract Documents.

Electrician Certification and Labor Compliance: It is the sole responsibility of the contractor, if applicable, to ensure compliance with CA Labor Code 3099-3099.5 regarding electrician certification requirements. All General Electricians and Fire/Life Safety Technicians in the employ of C-10 contractors must be certified in order to perform electrical work in CA. Information on the electrician certification program may be obtained at the Division of Apprenticeship Standards (DAS) at <http://www.dir.ca.gov/DAS/ElectricalTrade.htm>.

Preliminary Notices and Stop Notices: Preliminary (Public Work) Notices and Stop Notices shall be filed, if applicable, in accordance with California Civil Code Sections 3098, 3111, 3158, 3181, 3183, 3184, 3241 and 3252. For the Department of Parks & Recreation construction contracts notices shall be delivered to:

County of San Diego Operations Center
Department of Parks and Recreation
Attn.: Ileszic Formeller, Park Project Manager
5500 Overland Avenue, Suite 410
San Diego, CA 92123-1248

Air Pollution Compliance: The Contractor shall be in compliance with all federal, state, and local laws and regulations applicable to the Contractor.

INFORMATION FOR BIDDERS

The bidder's attention is directed to Section 2, "Bid Requirements and Conditions," of the Standard Specifications and the modifications to said Section 2 contained in Part VII of these Contract Documents.

The prospective bidder shall prepare the Proposal and Bond as provided therein, and failure to do so may be cause for rejection.

PREPARATION OF BID FORMS

Preparation: The Owner invites bids, on the forms posted on the Department of Purchasing and Contracting's BuyNet website under "Documents to be Executed by Bidder," to be submitted on or before the time and place set for the opening of bids in the published "Notice to Contractors Inviting Bids." Bids not presented on forms so furnished will be disregarded. All downloaded and printed forms must be consistent and conform to the P&C official posted documents.

These Contract Documents on the Department of Purchasing and Contracting BuyNet website

contain the Bid forms (Part II), together with the Notice to Contractors, Contract and Special Provisions. Part II of these Contract Documents shall be returned in a sealed envelope bearing on the outside the name of the bidder, bidder's address, the name of the project for which the bid is submitted, and the appropriate State Contractor's License designation held by the bidder.

The Bid must be executed in accordance with the instructions contained on the forms provided. If the bidder is an individual or a partner, the signature on the Bid and the Bidder's Bond must be the same as the name of the bidder shown on other parts of these forms, (showing the name as "J. E. Doe" and the signature as "John E. Doe" may be considered as an irregularity).

Modifications on the Submitted Bid: Modifications, changes or additions to the Bid may be considered an irregularity. Erasures or corrections in preparing the bids must be initialed by the person(s) signing the Bid. Alternate bids will not be considered unless called for.

Competency of Bidders: No award will be made to a Contractor who, in accordance with Chapter 9, Division 3, Business and Professions Code, is not properly licensed to do the described work.

Prospective bidders may be required to file with the Owner answers to questions contained in a questionnaire and a financial statement including a complete statement of their financial ability and experience in performing previous public works of a similar nature.

DOCUMENTS SUPPLEMENTING THE BID

Bid Security: Each bid shall be accompanied by cash, a certified or cashier's check, or a bidder's bond executed by a corporation duly authorized to issue bonds in the State of California. Cash, check or bond shall be in the amount of not less than ten (10) percent of the maximum amount of the bid. Check or bond shall be made payable to the order of the Owner designated in the Notice to Contractors Inviting Bids.

Said cash, check or bond shall be given as a guarantee that the bidder will, within the period specified after being requested to do so by the Owner, enter into a contract and provide the required bonds if awarded the work; if the bidder to whom the work has been awarded and to whom the request has been made refuses or fails to enter into said contract and provide the required bonds within the specified time, the cash or check shall be forfeited to the Owner or the principal and surety on the bond shall be liable to the Owner for the principal amount thereof in accordance with its terms.

If the lowest responsible bid is not accepted by the Owner within the period specified following the date set for the opening of bids, or for such further period of time as may be agreed upon in writing between the Owner and the bidder concerned, or if the bidder to whom the contract is awarded executes and delivers to the Owner the required Contract Documents, the amount of the cash or certified or cashier's check will be returned to the bidder. Attention is directed to the requirement noted on the contract bonds that the Attorney-in-Fact shall attach a certified copy of the Power of Attorney.

Designation of Subcontractor: The Business Name and Address, the Portion of Work, and License Number that will be done by each subcontractor (including DVBE subcontractors) for all portions of the work, including any additive alternates, are required at the time of bid submittal. An inadvertent error in listing the California contractor license number must be corrected by the prime contractor within 24 hours after bid opening by email to the Procurement Contracting Officer listed as contact for this RFB, provided the corrected contractor's license number corresponds to the submitted name and location for that subcontractor, or else the bid may be determined non-responsive. The remainder of the information shall be submitted by all bidders within two business days of bid opening by e-mail to said Procurement Contracting Officer. If no subcontractors are to be designated, enter the word "NONE."

AMENDMENTS AND INTERPRETATION OF CONTRACT UNIT

Addenda and Interpretations: The Owner will not be responsible for any oral interpretation of the

meaning of the plans, specifications, or other pre-bid documents. Every request for such interpretation shall be in writing forwarded via email to Veronica.Ford@ssdcountry.ca.gov and must be received at least ten (10) days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be posted on the County BuyNet website at <http://buynet.sdcounty.ca.gov>. It is the responsibility of all prospective bidders to check the County BuyNet website for any updates to contract documents. All addenda so issued shall become part of the Contract Documents.

Interpretation of Estimated Quantities: An estimate of quantities of work to be done and materials to be furnished under these specifications is given in the Bid, Special Provisions, or shown on the construction plans. It is given only as a basis for comparison of bids and the award of the contract. The Owner does not expressly or by implication guarantee that the actual quantities involved will correspond exactly therewith. Payment to the Contractor will be made only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications.

Rejection of Bids:

The Owner reserves the right to reject any or all bids and the right to waive technicalities if such waiver is in its best interest and conforms to local laws and ordinances pertaining to the letting of construction contracts. Bids in which the prices are obviously unbalanced, or the submittal is incomplete, may be rejected.

AWARD AND EXECUTION OF THE CONTRACT

The bidder's attention is directed to Section 3, "Award and Execution of Contract," of the Standard Specifications, the modifications to said Section 3 contained in Part VII of these Contract Documents and to Part III of these Contract Documents which contains all the documents the successful bidder shall execute.

Notice of Intent: For purposes of clarification regarding Board of Supervisors Policy A-97, "Protest Procedures for Award of Contracts" the posting of the bid abstract is equivalent to the posting of the Notice of Intent (NOI).

Award of the Contract: The bids will be compared on the basis of the base bid plus additive alternates, including those bid items listed in additive alternate bid items, if any, in combinations as stipulated in the Bid, which may be selected by the Owner.

Cancellation of Award: The Owner reserves the right to cancel the award without liability to the bidder, except return of bid guaranty, at any time before a Contract has been fully executed by all parties and is approved by the Owner.

PROTEST PROCEDURES

Protest of contract award must be made in writing and shall be filed with the Contracting Officer identified in the Contract Document. Protests must be filed within five (5) business days after a Notice of Intent to award the contract has been posted in a public place in the County's Contracting Office or County Internet website. Protests must conform to the requirements of Board of Supervisors Policy "A-97 Protest Procedures for Award of Contracts". The policy is available for review at <http://www.sdcounty.ca.gov/cob/docs/policy/A-97.pdf>

For purposes of clarification regarding Board of Supervisors Policy "A-97, Protest Procedures for Award of Contracts" the posting of the bid abstract on BuyNet (<http://buynet.sdcounty.ca.gov>) is equivalent to the posting of the Notice of Intent (NOI) to award.

TAX INFORMATION

In compliance with California Revenue and Taxation code section 18662, if you are a non-resident of California (out-of-state invoices) who receives California source income, the County will pay

California Use Tax directly to the State of California per permit no. SR FH 25-632384. Fifteen (15) business days prior to the first payment, new suppliers or suppliers with expired forms or forms with incorrect information, must submit new forms to the County (forms are available from the Franchise Tax Board websites listed in the next page).

Under certain circumstances you may be eligible for reduced or waived non-resident withholding. If you have already received a waiver or a reduced withholding response from the State of California and the response is still valid, submit the response to the County in lieu of the forms. Failure to submit the required forms will result in withholding of payments.

Refer to the Franchise Tax Board websites (listed below) for tax forms and information on non-resident withholding, including waivers or reductions. The County will not give you any tax advice. It is recommended you speak with your tax adviser and/or the State of California for guidance.

Franchise Tax Board Websites:

<http://www.ftb.ca.gov>

http://www.ftb.ca.gov/individuals/Withholding_Definitions.shtml

http://www.ftb.ca.gov/individuals/wsc/Processing_Changes_for_2010.shtml

http://www.ftb.ca.gov/individuals/wsc/forms_and_publications.shtml

http://www.ftb.ca.gov/individuals/wsc/decision_chart.shtml

Submit forms to the Auditor & Controller via fax at (858) 694-2060 or mail originals to: County of San Diego, 5530 Overland Ave., Suite 410, San Diego, CA 92123. The P.O. Number or Contract Number (if available) and "California Revenue and Taxation Code Section 18662" must appear on fax cover sheet and/or the outside of the mailing envelope.

GENERAL INFORMATION REGARDING COMPLIANCE WITH
DISABLED VETERANS BUSINESS ENTERPRISE (DVBE) PROGRAM

1. Disabled Veterans Business Enterprises will be afforded full opportunity to submit bids in response to this invitation. DVBE firms bidding as prime contractors will automatically meet the stated Disabled Veterans Business Enterprise (DVBE) participation.
2. Certified DVBE Information is available at the California State Department of General Services (DGS), Procurement Division (PD), Office of Small Business and DVBE Services (OSDS) website:

Information can be viewed or downloaded from:

<http://www.dgs.ca.gov/pd/Programs/OSDS.aspx>

COUNTY DISABLED VETERANS BUSINESS ENTERPRISE PROGRAM

1. Board of Supervisors Policy B-39a
Board of Supervisors Policy B-39a states that Disabled Veterans Business Enterprises (DVBEs) will be afforded maximum opportunity to compete for all County contracts;
The policy can be downloaded at <http://www.sdcounty.ca.gov/cob/docs/policy/B-39a.pdf>.
2. Objectives
The following DVBE participation is imposed to recognize the service of disabled veterans to our country.
3. DVBE Participation for the Project
DVBE participation of three percent (3%) of Bid amount is required for a public work project estimated (by the County) to exceed \$1million. A good faith effort cannot be accepted in lieu of meeting the 3% requirement. A bidder who fails to meet this requirement shall be declared non-responsive and the next lowest responsible and responsive bidder that complies with this requirement will be awarded the contract.

For a public work project that is estimated (by the County) to be between \$500,000 and \$1million, the prime contractor shall make a good faith effort to meet-or-exceed 3% DVBE subcontractor participation, and the Good Faith Effort shall be documented in accordance with this bid document demonstrating all participation was obtained prior to bid submittal or the bidder may be deemed non-responsive.

For a public work project estimated (by the County) to be less than \$500,000, DVBE participation is encouraged, but not required. DVBE participation may be documented on page 2-15, but is not required at this estimate level.

4. DVBE Subcontractor Documentation
The bidder shall designate all licensed subcontractors in accordance with the instructions on the form titled DESIGNATION OF SUBCONTRACTORS contained in Part II of these Contract Documents. Designation of Subcontractors is due at the time of bid. In addition, the bidder shall designate at the time of bid the DVBE prime contractors, subcontractors, and vendors (material suppliers and service providers) on the BIDDER DVBE INFORMATION form (page 2-16). The remaining information on the BIDDER DVBE INFORMATION form and copies of the DVBE bids are due within 2 business days of the Bid opening. "Good Faith Effort Documentation" shall be submitted in accordance with Item 7 below.

5. Credit Toward Participation for DVBE Prime Contractors, Subcontractors and Vendors

A DVBE prime contractor automatically meets a DVBE participation for a project. If the Prime is not a DVBE, compliance with 3% DVBE participation shall be calculated by taking the aggregate value of all DVBE subcontracts to be used on the project as a percentage of the total bid, which shall include all additive alternates, if any. Participation amounts to a DVBE must be for a commercially useful function, as that term is defined in California Military and Veterans Code § 999(b)(5)(B). In addition, for a DVBE to perform a commercially useful function, the amount the firm is to be paid under the contract shall be commensurate with the bid amount for the work it is actually performing and the DVBE credit claimed for its performance of the work.

6. Good Faith Effort Defined

a. A bidder who fails to meet the stated DVBE participation requirement for this project shall have made a good faith effort to meet participation prior to the time bids are submitted.

b. In evaluating the good faith effort of a bidder, the Owner shall consider the following criteria:

- 1) The bidder solicited certified DVBEs to perform work or provide supplies or services for the project. Good faith effort shall include solicitation of individual certified DVBEs. Record of firms solicited shall be included in the Documentation of Good Faith Effort submittal.

Solicitations conducted must be documented in the Documentation of Good Faith Effort. DVBE subcontractors solicited must be licensed for appropriate work on this project, and must be physically located within the County of San Diego, or have indicated they would consider work in San Diego Service Region 11.

Good Faith Efforts not adequately documented shall be considered non-responsive.

- 2) Where DVBE bids were rejected, the bidder provided the reasons for the rejections. If no bids received from DVBEs, the bidder shall so indicate in the Documentation of Good Faith Effort submittal.
- 3) Contact with local DVBE organizations to identify DVBE firms is encouraged but is not a requirement for the Documentation of Good Faith Effort submitted to the Owner.
- 4) Due to relatively short project solicitation periods, the Owner does not require advertising in trade and focus publications as a condition of satisfying the good faith effort for the DVBE participation. Advertising alone without direct solicitation of DVBE firms as required in paragraph 1) above does not satisfy the Good Faith Effort.

7. Good Faith Effort Documentation

For public work projects estimated (by the County) to be between \$500,000 and \$1 million where a DVBE requirement has not been established, all bidders, are required to submit the Documentation of Good Faith Effort (pages 2-16 through 2-18; and supporting documentation), in addition to the BIDDER DVBE INFORMATION form (page 2-14), within 2 business days of the Bid opening.

When the stated DVBE participation requirement is met, only the BIDDER DVBE INFORMATION form (page 2-14), contained in these Contract Documents, is required within 2 business days of Bid opening.

Bidders are cautioned that even if their BIDDER DVBE INFORMATION form (page 2-14) indicates the stated DVBE participation is met, all bidders should still consider submitting Documentation of Good Faith Effort. Submittal of satisfactory Documentation of Good Faith Effort will protect eligibility for award for those public work projects estimated (by the County) between \$500,000 and \$1 million in the event the County, in its review, finds that the stated DVBE participation has not been met.

The DVBE Good Faith Effort, if required, must be submitted on the DOCUMENTATION OF GOOD FAITH EFFORT forms (pages 2-17 through 2-19) contained in these Contract Documents and shall include sufficient and timely supporting documentation to validate the solicitations conducted.

8. Protest Procedure for DVBE

A bidder who does not attain the stated project DVBE participation or has not made a "good faith effort" in accordance with these bid document instructions may be declared non-responsive. A bidder so declared may file a protest in writing with the Director, Department of Purchasing and Contracting within five (5) business days of the notification of the declaration, in accordance with Board of Supervisor Policy A-97 "Protest Procedures for Award of Contract" located at:

<http://www.sdcountry.ca.gov/cob/docs/policy/A-97.pdf>.

9. DVBE Certification

Eligible contractors, subcontractors and vendors wishing to participate as DVBEs on this project must be certified by the California State Department of General Services (DGS), Procurement Division (PD), Office of Small Business and DVBE Services (OSDS), and have a current certification on the date bids are opened.

Information regarding certification and certified DVBEs can be obtained by visiting the Department of General Services site at:

<http://www.pd.dgs.ca.gov/pd>

PART II
DOCUMENTS TO BE EXECUTED BY BIDDER

STATE OF CALIFORNIA
COUNTY OF SAN DIEGO
PROPOSAL TO THE BOARD
FOR
LAKESIDE EQUESTRIAN FACILITY
ORACLE PROJECT NO. 1020367

REQUEST FOR BID NO.: 10161

Name of Bidder _____

Business Address _____

Place of Residence _____

LOCATION

The work to be performed under this contract is located in the vicinity of 11055 Moreno Avenue, Lakeside, CA 92040.

Said work is to be performed in accordance with the Contract and the Special Provisions annexed hereto and including Addenda Nos. _____, _____, and _____, and also in accordance with Parts 1 through 9 of the Standard Specifications of the State of California, Department of Transportation, current edition, and Greenbook Standard Specifications for Public Works Construction, current edition, and the modifications to said Standard Specifications and said Amendments contained in Part VII of these Contract Documents.

The work to be done is shown on "Bid Schedule" and Project Plans in Part IX of these Contract Documents.

By signing this proposal on the signature portion hereof, the undersigned, as bidder, under penalty of perjury deposes and says: that the only persons or parties interested in this Proposal as Principals are those named herein; that the bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with said proposal; that the undersigned has carefully examined the location of the proposed work, the annexed proposed form of Contract, and the Plans, Special Provisions and Specifications therein referred to; and the undersigned proposes, and agrees if this Proposal is accepted, that the undersigned will furnish the required Bonds and Contract with the Owner, in the form and copy of the Contract annexed hereto, to provide all necessary machinery, tools, apparatus and other means of construction, and to do all the work and furnish all the materials specified in the Contract, in the manner and time therein set forth, and that the undersigned will take in full payment therefore the following unit and lump sum prices, to wit:

BID SCHEDULE

BASE BID

No.	Description	Estimated Qty	Unit of Measure	Unit Price	Total
Mobilization & Contractor's Facilities					
1	Mobilization	LS	LS	LS	
2	Temporary Site Utilities - Water & Power	LS	LS	LS	
3	Temporary Sanitary Facilities	LS	LS	LS	
4	SWPPP Program Requirements & BMPs	LS	LS	LS	
5	Construction Survey Staking	LS	LS	LS	
Civil/Sitework – Demolition					
6	Demo – Appurtenances	LS	LS	LS	
7	Demo – Perimeter Fencing	4,540	LF		
8	Demo – Utilities	LS	LS	LS	
Civil/Sitework - Intersection Plan					
9	R1 'STOP' and R1-3 'ALL WAY' Signs & Posts	3	EA		
10	12" White Limit Line per CALTRANS Std. Plan A24E	4	EA		
11	"STOP" Marking per CALTRANS Std. Plan A24D	6	EA		
12	Type IV(L) Arrow per CALTRANS Std. Plan A24A	3	EA		
13	8" Wide White Stripe per Plan A20D / Detail 38A	50	LF		
14	W17 ' STOP AHEAD' Sign	2	EA		
15	AHEAD' Marking per CALTRANS Std. Plan A24D	2	EA		
16	Dashed 6" White Line per CALTRANS Std. Plan A20D / Detail 39A	98	LF		
17	Removal of Conflicting Markings, Sandblasting/Grinding and Sand Sealing	LS	LS	LS	
18	6" Yellow Line per Plan A20A / Detail 22	540	LF		
Civil/Sitework - Site Improvements					
19	6' Vinyl-Coated Chain-Link Fence per SDRSD M-06 (Site Perimeter)	2,945	LF		
20	6'x25' Vinyl-Coated Chain-Link Gate per SDRSD M-05 with Fire Dept. Lock (Main & South)	2	EA		
21	County of San Diego Day Use Sign	LS	LS	LS	
22	Peeler Pole Fence - Base Bid	552	LF		
23	County of San Diego Entrance Monument Sign	LS	LS	LS	
Civil/Sitework - Grading Plan					

24	Earthwork - Clear & Grub including Disposal of Vegetation Off-Site	14	ACRE		
25	Earthwork - Grading - CUT	23,200	CY		
26	Earthwork - Grading - FILL	17,000	CY		
27	Earthwork - Grading - NET SURPLUS (Haul Off Site)	6,287	CY		
28	Public Trail 4" D.G. - Rough/Fine Grading	14,985	SF		
29	Public Trail - Import 4" D.G., Place, Grade & Compact	185	CY		
30	Temporary Parking Lot Surfacing - Rough/Fine Grading	374,693	SF		
31	Temporary Parking Lot Surfacing - Import & Compact 2" DG & 2" AB	4,626	CY		
32	Minor Concrete - Main Driveway Concrete SOG	LS	LS	LS	
33	Minor Concrete - South Gate Driveway Concrete SOG	LS	LS	LS	
34	Minor Concrete - Helix Easement Overlay 9" Concrete SOG	LS	LS	LS	
35	Minor Concrete - Type A Curb Ramp per SDRSD G-27	1	EA		
36	Minor Concrete - Type B Curb Ramp per SDRSD G-27	1	EA		
Civil/Sitework - Biofiltration Basins and Other Site Improvements Including Drainage Control Facilities					
37	Biofiltration Basin 1:				
38	24"x6'-0" PVC Riser with PVC Trash Rack	1	EA		
39	3/4"-2" Clean Angular Gravel (18" Layer)	246	CY		
40	8" PVC Perforated Subdrain with Cleanout & Cap	828	LF		
41	Pea Gravel (4"-6" Layer)	82	CY		
42	Permeable Media (18" Layer)	246	CY		
43	10" PVC Solid Overflow Pipe	76	LF		
44	Aged Non-Floatable Hardwood Mulch (3" Layer)	41	CY		
45	Biofiltration Basin 2:				
46	24"x6'-0" PVC Riser with PVC Trash Rack	1	EA		
47	3/4"-2" Clean Angular Gravel (18" Layer)	88	CY		
48	8" PVC Perforated Subdrain with Cleanout & Cap	50	LF		
49	Pea Gravel (4"-6" Layer)	30	CY		
50	Permeable Media (18" Layer)	88	CY		
51	10" PVC Solid Overflow Pipe	79	LF		
52	Aged Non-Floatable Hardwood Mulch (3" Layer)	15	CY		
53	Biofiltration Basin 3:				
54	24"x6'-0" PVC Riser with PVC Trash Rack	2	EA		
55	3/4"-2" Clean Angular Gravel (18" Layer)	282	CY		

56	8" PVC Perforated Subdrain with Cleanout & Cap	177	LF		
57	Pea Gravel (4"-6" Layer)	94	CY		
58	Permeable Media (18" Layer)	282	CY		
59	12" PVC Solid Overflow Pipe	97	LF		
60	Aged Non-Floatable Hardwood Mulch (3" Layer)	47	CY		
61	Site Drainage Improvements:				
62	Apron East Side 7" Concrete Lining	18	CY		
63	Low Flow Channel 7" Concrete-Lined	96	CY		
64	Concrete-Lined Swale (Northeast)	27	CY		
65	Box Culvert Complete	LS	LS	LS	
66	Rip-Rap, Class No. 2 Backing, 1.5' Thick (approx. 2,500 SF) - South Side	123	CY		
67	Rip-Rap, Class No. 2 Backing, 1.5' Thick (approx. 2,000 SF) - Southeast Curve	115	CY		
68	Rip-Rap, Class No. 2 Backing, 1.5' Thick (approx. 1,000 SF) - East Side	49	CY		
69	Rip-Rap, Class No. 2 Backing, 1.5' Thick (approx. 1,000 SF) - Southwest Corner	37	CY		
Civil/Sitework - Site Utilities					
70	Fire Water System:				
71	6" PVC C-900 Class-200 Pipe	900	LF		
72	6" DI MJ 90 Ell - Epoxy Lined & Coated w/Accessories	1	EA		
73	6" DI MJ 45 Ell - Epoxy Lined & Coated w/Accessories	2	EA		
74	6" DI MJ Tee - Epoxy Lined & Coated w/Accessories	2	EA		
75	6" Flex Coupling - Epoxy Lined & Coated w/Accessories	2	EA		
76	Fire Hydrant Assembly	LS	LS	LS	
77	Fire Service Backflow Preventer Assembly	LS	LS	LS	
78	Connections - 6" PVC to 8" ACP (Lakeside Irrigation District)	LS	LS	LS	
79	Connections - 6" Meter Assembly with Concrete Pad	LS	LS	LS	
Civil/Sitework - Erosion Control Plan					
80	SC-05 Fiber Rolls with Staking - Biofiltration Basin 1	519	LF		
81	SC-05 Fiber Rolls with Staking - Biofiltration Basin 2	181	LF		
82	SC-05 Fiber Rolls with Staking - Biofiltration Basin 3	335	LF		
83	SC-04/06 Gravel Bag Berm (Check Dam and Inlet Protection)	333	LF		

84	SC-01 Silt Fence with Staking	3,077	LF		
85	TC-01 Construction Entrance/Exit with Rattle Strips	2	EA		
Civil/Sitework - Sump Pump Station at Biofiltration Basin No. 2					
86	Sump Pump Assembly	LS	LS	LS	
Site - Electrical					
87	SDG&E Service Planning & Permitting Fees	LS	LS	LS	
88	Primary Conduit Duct Bank from Existing SDG&E Point of Connection to Transformer Pad	LS	LS	LS	
89	Utility Transformer Concrete Pad (Assume Transformer by SDG&E) Including Grading & Precast Concrete Pad	LS	LS	LS	
90	Service Meter Switchboard 'MSB' Concrete Pad/Foundation	LS	LS	LS	
91	Service Meter Switchboard 'MSB' Grounding	LS	LS	LS	
92	Service Meter Switchboard 'MSB' 600A, 120/208V, NEMA 3R	LS	LS	LS	
93	Panel 'A' 200A - Covered Arena	LS	LS	LS	
94	Panel 'A1' 200A - Covered Arena	LS	LS	LS	
95	Panel 'E' 200A - Shop Building	LS	LS	LS	
96	Panel 'LCP' 15A - Duplex Sump Pump Local Control Panel	LS	LS	LS	
97	Pole-Mounted Light Fixtures - P1 LED Solar-Powered Area Light Fixture (5230 Lumens) - Carmanah EC-340-5230	1	EA		
98	Pole-Mounted Light Fixtures - P3 LED Solar-Powered Area Light Fixture (6060 Lumens) - Carmanah EC-340-6060	5	EA		
99	24"x8'-0" Light Pole Reinforced Concrete Bases w/Anchor Bolts	6	EA		
100	Concrete Pull Boxes (PB-1 through PB-3) - 2'x3' with Galv Steel H20-Loading Bolt-Down Cover & SS Bolts	3	EA		
101	Duct Bank PB-1 to PB-3 including Conduit, Spacers, Encasement, Wire	433	LF		
Area 1 Improvements - Covered Arena					
102	1.1 Structure - Column Footings/Foundations - Excavation, Form, Rebar, Set Anchor Bolts, Backfill, Ready for Building CONTRACTOR ALLOWANCE	LS	LS	LS	
103	1.1 Structure - Pre-Engineered Metal Building (incl. Sales Tax & Freight)	LS	LS	LS	
104	1.1 Structure - Pre-Engineered Metal Building (Installation)	LS	LS	LS	
105	1.6 Electronic Scoreboard	LS	LS	LS	
106	1.7 Bleachers	LS	LS	LS	

107	1.7 Bleachers Concrete Pad/Foundation/Walkways	LS	LS	LS	
108	1.8 Patio Area	LS	LS	LS	
109	1.9 Arena Fencing, Gates & Chutes (Kovac Ranch Equipment)	LS	LS	LS	
110	Arena Equipment – Footing Material - Import, Place and Compact	LS	LS	LS	
111	Arena Equipment - Electronic Public Address System	LS	LS	LS	
112	Lighting - LED High-Bay Luminaire Pendant-Mounted - Litetronics HB220W140DL	96	EA		
113	Lighting - Conduit, Wire, Hangers, J-Boxes and Misc.	LS	LS	LS	
114	Lighting - Spare Conduit Below Surface	LS	LS	LS	
115	Lighting - 0-10VDC Lighting Dimmer Controls Station	1	EA		
116	Lighting - Ceiling Fan Controls Station	1	EA		
117	Electrical Terminations, Ring-Out, Testing & Misc.	LS	LS	LS	
118	Fire Protection - Sprinkler System including Fire Riser	540	HEADS		
119	HVAC - Ventilation Fans and Control System	8	EA		
Area 4 Improvements - Warm-Up Area					
120	4.1 Shop / Storage Pre-Engineered Structure including SOG and Single-Story PEMB	LS	LS	LS	
121	4.1 Shop / Storage Pre-Engineered Structure FF&E (Furnished and Installed)	LS	LS	LS	
122	4.1 Shop / Storage Structure - Utility Connections to Building	LS	LS	LS	
123	4.1 Shop / Storage Structure - Misc. Concrete Exterior Slabs at Garage Entrances	LS	LS	LS	
Area 5 Improvements - Day Use Area / Trail Staging Area					
124	5.2 Picnic Tables (Area 5)	4	EA		
125	5.3 Trash Bin for Horse Manure (Area 5)	1	EA		
126	Horse Hitch (Area 5)	1	EA		
127	Water Spigot (Including Potable Water Plumbing from Underground System)	1	EA		
128	Plumbing - Exterior Water Connection	LS	LS	LS	
Project Close-Out					
129	Testing, Start-Up and Commissioning (All Facilities)	LS	LS	LS	
130	Special Final Inspections / Inspection Participation (County, SDG&E and Others)	LS	LS	LS	
131	Spare Parts, Lubricants, Oils and Other Special Tools and Materials	LS	LS	LS	
132	O&M Manuals & Warranties	LS	LS	LS	

133	All Project Completion Documents (As-Built Drawings, Schedules, Test Reports)	LS	LS	LS	
134	Cleanup and Demobilization	LS	LS	LS	
Base Bid Total:					

ADDITIVE ALTERNATE 1

No.	Description	Estimated Qty	Unit of Measure	Unit Price	Total
Civil/Sitework - Grading Plan					
135	Minor Concrete - Kitchen Pad 9" Concrete SOG & Parking Area	LS	LS	LS	
136	Minor Concrete - Restrooms Pad 9" Concrete SOG & Parking Area	LS	LS	LS	
137	Minor Concrete - Dumpster Pad 9" Concrete SOG & Parking Area	LS	LS	LS	
Civil/Sitework - Site Utilities					
138	Potable Water System:				
139	4" PVC C-900 Class-200 Pipe	1,674	LF		
140	4" DI MJ 90 Ell - Epoxy Lined & Coated w/Accessories	3	EA		
141	4" DI MJ 45 Ell - Epoxy Lined & Coated w/Accessories	1	EA		
142	4" DI MJ Tee - Epoxy Lined & Coated w/Accessories	5	EA		
143	4" Flex Coupling - Epoxy Lined & Coated w/Accessories	4	EA		
144	4" PVC to 8" ACP (Lakeside Irrigation District)	LS	LS	LS	
145	4" Meter Assembly with Concrete Pad, Valves, Bollards and Painting	LS	LS	LS	
146	Water Service Backflow Preventer Assembly	LS	LS	LS	
147	Encase in Red Concrete Over Helix Water District Easement	LS	LS	LS	
148	Sanitary Sewer System:				
149	6" PVC SDR-35 Gravity Sewer Pipe	1,080	LF		
150	6" PVC SDR-35 Gravity Sewer 45 Ell	2	EA		
151	6" PVC SDR-35 Gravity Sewer Wye	2	EA		
152	6" PVC SDR-35 Sewer Pipe Cleanout Assembly including Box & Cover	3	EA		
153	6" Flex Coupling - Epoxy Lined & Coated w/Accessories	3	EA		

154	Connections - 6" PVC to Existing SDRSD Sewer with SS-04 Connection & SC-01 Cleanout	LS	LS	LS	
155	Natural Gas System:				
156	2" Polyethylene Gas Piping/Flex Tubing per Local Codes	620	LF		
157	Connections - 2" Gas Service Connection & Fees including Metering	LS	LS	LS	
158	Gas Line Connection to Main	LS	LS	LS	
159	Encase in Red Concrete Over Helix Water District Easement	LS	LS	LS	
Site – Electrical					
160	Panel 'B' 100A - Kitchen / Meeting Room Building	LS	LS	LS	
161	Panel 'D' 50A - Restrooms Building	LS	LS	LS	
Area 1 Improvements – Covered Arena					
162	1.4 Pre-Engineered Announcer's Booth Structure	LS	LS	LS	
163	1.4 Pre-Engineered Announcer's Booth - FF&E (Furnished and Installed)	LS	LS	LS	
Area 4 Improvements - Warm-Up Area					
164	1.2 Meeting Room / Kitchen Pre-Engineered Structure	LS	LS	LS	
165	1.2 Meeting Room / Kitchen - FF&E (Furnished and Installed)	LS	LS	LS	
166	1.3 Restroom Pre-Engineered Structure	LS	LS	LS	
167	1.3 Restroom - FF&E (Furnished and Installed)	LS	LS	LS	
168	1.4 Dumpster Trash Enclosure - Pre-Engineered Structure	LS	LS	LS	
169	1.4 Dumpster Trash Enclosure – FF&E (Furnished and Installed)	LS	LS	LS	
Additive Alternate 1 Total:					

ADDITIVE ALTERNATE 2

No.	Description	Estimated Qty	Unit of Measure	Unit Price	Total
Site – Electrical					
170	Panel 'RV' 30A & 50A - RV Parking Power Pedestals	LS	LS	LS	
171	Panel 'HOST' 50A - Host Pad RV Power Pedestal	LS	LS	LS	

172	Pole-Mounted Light Fixtures - P1 LED Solar-Powered Area Light Fixture (5230 Lumens) - Carmanah EC-340-5230	3	EA		
173	Pole-Mounted Light Fixtures - P3 LED Solar-Powered Area Light Fixture (6060 Lumens) - Carmanah EC-340-6060	8	EA		
174	24"x8'-0" Light Pole Reinforced Concrete Bases w/Anchor Bolts	11	EA		
Area 4 Improvements - Warm-Up Area					
175	4.3 Host Pad - 50'x50' Concrete Pad/Foundation	LS	LS	LS	
176	4.3 Host Pad - 50'x50' Pre-Engineered Shade Structure (Includes Installation)	LS	LS	LS	
177	4.4 RV Hook-Up Pedestal Connections (Water, Sewer and Power)	5	EA		
178	4.5 Heated Wash Racks (Including Misc. Metals & Plumbing)	LS	LS	LS	
179	Corrals (10'x10', Corral Fencing & Gates with Concrete Footings)	5	EA		
Area 5 Improvements - Day Use Area / Trail Staging Area					
180	5.1 Pavilion - Concrete Pad/Foundation	LS	LS	LS	
181	5.1 Pavilion – Pre-Engineered Shade Structure	LS	LS	LS	
182	5.1 Pavilion – Pre-Engineered Shade Structure Installation	LS	LS	LS	
Additive Alternate 2 Total:					

ADDITIVE ALTERNATE 3

No.	Description	Estimated Qty	Unit of Measure	Unit Price	Total
Civil/Sitework - Site Improvements					
183	Grand Entrance Gateway & Sign	1	EA		
184	DEDUCT: 6'x25' Vinyl-Coated Chain-Link Gate per SDRSD M-05 with Fire Dept. Lock (Main Gate replaced by Grand Entrance Sign)	1	EA	-	-
185	Peeler Pole Fence - East Side	1,140	LF		
186	Peeler Pole Fence - Biofiltration Basin 1 Perimeter	521	LF		
187	Peeler Pole Fence - Biofiltration Basin 2 Perimeter	207	LF		
188	Peeler Pole Fence - Biofiltration Basin 3 Perimeter (2 Sides Only)	188	LF		
189	Peeler Pole Fence - South Side Public Trail	900	LF		

190	Peeler Pole Fence - South Side Equestrian Trail	691	LF		
191	Peeler Pole Fence - West Side Equestrian Trail	815	LF		
192	Peeler Pole Fence (Tree Guards)	352	LF		
Civil/Sitework - Grading Plan					
193	Final Parking Lot Surfacing - Rough/Fine Grading	230,467	SF		
194	Final Parking Lot Surfacing - Import & Compact Additional 2" DG & 4" AB	4,268	CY		
Site - Irrigation & Landscaping					
195	Irrigation Systems:				
196	Hot Tap Connection Service	LS	LS	LS	
197	1" Potable Irrigation Meter and Installation	LS	LS	LS	
198	1" Backflow Preventer on Concrete Pad	LS	LS	LS	
199	Backflow Preventer Enclosure	LS	LS	LS	
200	1" Master Valve	1	EA		
201	1" Flow Meter	1	EA		
202	Calsense Irrigation Controller, Conventional, 24 Sta.	1	EA		
203	Rain Shut Off Device and Enclosure	1	EA		
204	Pressure Mainline 1.5"	2,002	LF		
205	Pressure Mainline 1"	275	LF		
206	Quick couplers for hand watering and wash down.	11	EA		
207	Shrub Bed and Basin Irrigation	23,842	SF		
208	Drainage Channel Irrigation	14,840	SF		
209	Tree Bubblers	106	EA		
210	1" Meter Capacity Fee - Lakeside Water District	1	EA		
211	1" Meter Capacity Fee – SDCWA	1	EA		
212	Water District Plan Check Fees	1	EA		
213	Landscape / Planting:				
214	36" Box Trees	27	EA		
215	24" Box Trees	9	EA		
216	15 Gallon Trees	11	EA		
217	5 Gallon Shrubs	128	EA		
218	1 Gallon Shrubs	552	EA		
219	Boulders	108	EA		
220	River Cobble	1,920	SF		
221	Hydroseed	32,619	SF		
222	Fine Grading Landscape Areas	28,705	SF		
223	Bark Mulch Shrub Beds (not bio-basins)	10,737	SF		
224	Root Barriers	565	LF		
225	Landscape Maintenance Period	3	MO		
226	Grass-Lined Channel	32,619	SF		

Site – Electrical					
227	Pole-Mounted Light Fixtures - P1 LED Solar-Powered Area Light Fixture (5230 Lumens) - Carmanah EC-340-5230	1	EA		
228	Pole-Mounted Light Fixtures - P2 LED Solar-Powered Area Light Fixture (4480 Lumens) - Carmanah EC-340-4480	3	EA		
229	Pole-Mounted Light Fixtures - P3 LED Solar-Powered Area Light Fixture (6060 Lumens) - Carmanah EC-340-6060	2	EA		
230	24"x8'-0" Light Pole Reinforced Concrete Bases w/Anchor Bolts	6	EA		
Additive Alternate 3 Total:					

ADDITIVE ALTERNATE 4

No.	Description	Estimated Qty	Unit of Measure	Unit Price	Total
Civil/Sitework - Grading Plan					
231	Final Parking Lot Surfacing - Rough/Fine Grading	53,680	SF		
232	Final Parking Lot Surfacing - Import & Compact Additional 2" DG & 4" AB	994	CY		
233	Minor Concrete - Type B Curb Ramp per SDRSD G-27	1	EA		
Civil/Sitework - Site Utilities					
234	4" PVC C-900 Class-200 Pipe	2,253	LF		
235	4" DI MJ 90 Ell - Epoxy Lined & Coated w/Accessories	4	EA		
236	4" DI MJ 45 Ell - Epoxy Lined & Coated w/Accessories	1	EA		
237	4" DI MJ Tee - Epoxy Lined & Coated w/Accessories	4	EA		
238	4" Flex Coupling - Epoxy Lined & Coated w/Accessories	3	EA		
Site – Electrical					
239	Pole-Mounted Light Fixtures - P1 LED Solar-Powered Area Light Fixture (5230 Lumens) - Carmanah EC-340-5230	5	EA		
240	Pole-Mounted Light Fixtures - P2 LED Solar-Powered Area Light Fixture (4480 Lumens) - Carmanah EC-340-4480	-	EA		

241	Pole-Mounted Light Fixtures - P3 LED Solar-Powered Area Light Fixture (6060 Lumens) - Carmanah EC-340-6060	-	EA		
242	24"x8'-0" Light Pole Reinforced Concrete Bases w/Anchor Bolts	5	EA		
243	Concrete Pull Boxes (PB-4 through PB-9) - 2'x3' with Galv Steel H20-Loading Bolt-Down Cover & SS Bolts	6	EA		
244	Duct Bank PB-3 to PB-9 including Conduit, Spacers, Encasement, Wire	1,450	LF		
Area 2 Improvements - Outside Arena					
245	2.1 Bleachers – Pre-Engineered Shade Structure (Including Installation)	LS	LS	LS	
246	2.2 Bleachers	LS	LS	LS	
247	2.2 Bleachers Concrete Pad/Foundation	LS	LS	LS	
248	2.3 Announcers Booth – Pre-Engineered Structure	LS	LS	LS	
249	2.3 Announcers Booth – FF&E (Furnished and Installed)	LS	LS	LS	
250	2.4 Covered Viewing Box – Pre-Engineered Structure	LS	LS	LS	
251	2.4 Covered Viewing Box – FF&E (Furnished and Installed)	LS	LS	LS	
252	2.5 Electronic Scoreboard	LS	LS	LS	
253	2.6 Arena Fencing & Equip. – Fencing & Gates (Kovac Ranch Equipment)	LS	LS	LS	
254	Arena Equip. – Footing Material - Import, Place and Compact	LS	LS	LS	
255	Light Fixtures, Conduit, Wire, Subpanels/Disconnects, Grounding	LS	LS	LS	
256	Water Spigots (Including Potable Water Plumbing from Underground System)	5	EA		
257	Electronic Public Address System	LS	LS	LS	
Area 3 Improvements - Livestock Corrals					
258	3.1 Livestock Corrals Pre-Engineered Alley Shade Structure (with installation)	LS	LS	LS	
259	3.2 Covered Compost Area (6 Bins)	LS	LS	LS	
260	3.3 Water Truck Filling Station	LS	LS	LS	
261	3.4 Cattle Alley (Kovac Ranch Equipment)	LS	LS	LS	
262	Feeder Troughs (Galv Steel Troughs)	4	EA		
263	Water Trough with Automatic Float Valve	4	EA		
264	Water Spigots (Including Potable Water Plumbing from Underground System)	5	EA		
265	Livestock Corrals - Fencing, Gates & Chutes (Kovac Ranch Equipment)	LS	LS	LS	

Additive Alternate 4 Total:	
-----------------------------	--

TOTAL BASE BID \$ _____

TOTAL ADDITIVE ALTERNATE 1 \$ _____

TOTAL ADDITIVE ALTERNATE 2 \$ _____

TOTAL ADDITIVE ALTERNATE 3 \$ _____

TOTAL ADDITIVE ALTERNATE 4 \$ _____

TOTAL BID (Base Bid + Add. Alt. 1 + Add. Alt. 2 + Add. Alt. 3 + Add. Alt. 4)\$ _____

Name of Bidder _____

BID COMPARISON AND AWARD

If this Proposal shall be accepted and the undersigned shall fail to contract as aforesaid and to give in sums as stated in the Notice to Contractors Inviting Bids, both a faithful Performance Bond, and a Payment Bond as required by Chapter 5 (commencing at Section 3225) and Chapter 7 (commencing at Section 3247), Title 15, Part 4, Division 3, of the California Civil Code, with surety satisfactory to the Owner within the time specified in Section 3-1.03 of the Standard Specifications after the undersigned has received notice of the award of the Contract from the Owner and that the Contract is ready for signature, the Owner may, at its option, determine that the bidder has abandoned the Contract, and thereupon this Proposal and the acceptance thereof shall be null and void, and the forfeiture of the security accompanying this Proposal shall operate and the same shall be the property of the Owner.

Bids are required for the entire work shown in the Base Bid and Additive Alternates 1, 2, 3 and 4 Bid Schedules. The lowest bid shall be the lowest total bid price (base bid and additive alternates 1-4):

The bidder shall set forth for each item of work, in clearly legible figures, a unit price and a total for the item in the respective spaces provided for this purpose. In the case of unit basis items, the amount set forth under the "Total" column shall be the extension of the unit price bid on the basis of the estimated quantity for the item.

The quantities listed in the Proposal are approximate only. Payment for work done will be made at the contract unit prices bid as applied to the quantities actually constructed or installed.

Award of the Contract, if awarded, will be to the lowest responsible bidder, for the Total Bid, subject to the Owner's right to reject any or all bids and to waive any informality or irregularity in the bids or bidding. Bids in which the prices are obviously unbalanced may be rejected. **The County may deem non-responsive any bids that contain any mathematical errors.**

Contract unit prices bid by the lowest responsive and responsible bidder shall be locked in for the duration of the contract, and the Owner has the right to award additional Additive Alternates at the unit prices bid, if additional funding becomes available. The County reserves the right to award the Base Bid Schedule and/or any Additive Alternate Bid Schedules in any sequence.

The bidder shall set forth for each item of work, in clearly legible figures, a unit price and a total for the item in the respective spaces provided for this purpose. In the case of unit basis items, the amount set forth under the "Total" column shall be the extension of the unit price bid on the basis of the estimated quantity for the item.

The quantities listed in the Proposal are approximate only. Payment for work done will be made at the contract unit prices bid as applied to the quantities actually constructed or installed.

The scope of work for the Contract, if awarded, will include the base bid plus any combination of the additive alternates, as determined by the Owner, subject to the Owner's right to reject any or all bids and to waive any informality or irregularity in the bids or bidding. Bids in which the prices are obviously unbalanced may be rejected. The County may deem non-responsive any bids that contain any mathematical errors.

Contract unit prices bid by the lowest responsive and responsible bidder shall be locked in for the duration of the contract, and the Owner has the right to award additive alternates included in the bid solicitation, but which have not already awarded at the unit prices bid, if additional funding becomes available.

Award of the Contract, if awarded, will be made within ninety (90) calendar days from the date specified for the opening of bids. Notwithstanding the foregoing, additive alternates not included in the initial award, may be added to and included into the contract following initial award by the delivery of a Notice to Proceed to Contractor.

Information requested on the Designation of Subcontractors and Bidder DVBE Information forms are required for the total bid amount (i.e., base bid and all additive alternates, if any).

PROHIBITED CONTRACTS

Section 67 of the San Diego County Administrative Code provides that the County shall not contract with, and shall reject any bid or proposal submitted by, the person or entities specified below, unless the Board of Supervisors finds that special circumstances exist which justify the approval of such contract:

- a) Persons employed by the County or of public agencies for which the Board of Supervisors is the governing body;
- b) Profit-making firms or businesses in which employees described in subsection (a) serve as officers, principals, partners, or major shareholders;
- c) Persons who, within the immediately preceding twelve (12) months came within the provisions of subsection (a) and who (1) were employed in positions of substantial responsibility in the area of service to be performed by the contract, or (2) participated in any way in developing the contract or its service specifications; and
- d) Profit making firms or businesses in which the former employees described in subsection (c) serve as officers, principals, partners, or major shareholders.

With the affixing of a signature to your response to this solicitation, officer certifies that the above provisions of the Code have been complied with, and that any exception will cause any ensuing contract to be invalid.

DRUG AND ALCOHOL POLICY

It is the policy of the Board of Supervisors that in order to attain or maintain a contract with the County, each contractor shall agree that while any contractor or the contractor's employees are performing services for the County, or using County equipment, that the contractor or the contractor's employees:

- 1. Shall not in any way be impaired because of being under the influence of alcohol or a drug.
- 2. Shall not possess, consume, or be under the influence of alcohol and/or an illegal drug.

3. Shall not sell, offer, or provide alcohol or a drug to another person.

DEBARMENT AND SUSPENSION

Contractor certifies that it, its principals, its employees and its subcontractors:

1. Are not presently debarred, suspended, proposed for debarment, and declared ineligible or voluntarily excluded from covered transactions by any State or Federal Department or agency.
2. Have not within a 3-year period preceding this Contract been convicted of, or had a civil judgment rendered against them for, the commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, State, or local) transaction; violation of Federal or State anti-trust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.
3. Are not presently indicted or otherwise criminally or civilly charged by a government entity (federal, State, or local) with commission of any of the offenses enumerated in the paragraph above; and
4. Have not within a 3-year period preceding this Contract had one or more public transactions (federal, State, or local) terminated for cause or default.

NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

(Title 23 United States Code Section 112 and
Public Contract Code Section 7106)

State of California)
) ss
)
County of San Diego)

In accordance with Title 23 United States Code Section 112 and Public Contract Code 7106, (Name) _____, being first duly sworn, deposes and says that he or she is (Title) _____ of (Company) _____ the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

I hereby certify, under penalty of perjury, that the foregoing statement is true and correct.

SIGNATURE OF BIDDER _____

DATE _____

COUNTY OF SAN DIEGO
BIDDER/OFFER DVBE INFORMATION

ATTACHMENT B

County of San Diego
Department of Purchasing and Contracting
REPRESENTATIONS AND CERTIFICATIONS

The following representations and certifications are to be completed, signed and returned with the offer (the term "offer" includes a bid, proposal, quote, statement of qualifications, or any other submission to provide goods and/or services).

1. BUSINESS TYPE

☐ For-profit ☐ Non-profit ☐ Government

2. INTERLOCKING DIRECTORATE

In accordance with Board of Supervisors Policy A-79, if Offeror is a non-profit and will be subcontracting with a related for-profit entity where an interlocking directorate, management or ownership relationship exists, Offeror must list all such entity(ies) on an attached separate sheet, and authorization must be sought from Board of Supervisors. If Offeror is a non-profit and does not submit such a list, Offeror certifies it has not entered into a subcontract relationship with a related for-profit entity.

List Attached? Yes ☐

3. BUSINESS REPRESENTATION

Offeror represents as a part of this offer the following information regarding the ownership, operation, and control of its business:

3.1. Are you a local business with a physical address within the County of San Diego? ☐ Yes ☐ No

3.2. Are you certified by the State of California as a:

☐ Disabled Veteran Business Enterprise(DVBE)

Certification #: _____

☐ Small Business Enterprise (SBE)

Certification #: _____

3.3. Are you certified by the U.S. Dept Of Veterans' Affairs as:

☐ Veteran Owned Small Business (VOSB)

Certification # _____

☐ Service Disabled Veteran Owned Small Business (SDVOSB)

Certification # _____

3.4. Estimated percentage of work in this offer to be performed or fulfilled locally (within the geographic boundaries of the County of San Diego): _____ %

4. DEBARMENT, SUSPENSION, AND RELATED MATTERS

4.1. Offeror certifies to the best of its knowledge that neither it nor any of its officers:

4.1.1. Are presently debarred, suspended, declared ineligible, or voluntarily excluded from covered transactions by any state, local, or federal department or agency.

4.1.2. Have within a three (3) year period preceding this agreement been convicted of or had a civil judgment rendered against them for commission of fraud or criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction; violation of federal or state antitrust statutes; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

4.2. Except as allowed for in Section 4.2.5, Offeror hereby certifies to the best of its knowledge that neither it nor any of its officers:

4.2.1. Are presently indicted for or otherwise criminally or civilly charged by a government entity (federal, state, or local) with the commission of any of the offenses enumerated in paragraph 4.1.2 of this certification;

4.2.2. Have within a three (3) year period preceding this agreement had one or more public transactions (federal, state or local) terminated for cause or default;

4.2.3. Are presently the target or subject of any investigation, accusation or charges by any federal, state or local agency or law enforcement, licensing, certification, ethics, or compliance body;

4.2.4. Are proposed for debarment by any state, local, or federal department or agency.

4.2.5. If Offeror is unable to certify Sections 4.2.1, 4.2.2, 4.2.3, or 4.2.4, it certifies that it has disclosed and attached to this Representations and Certifications the reason(s) it cannot do so. The disclosure must include the Section(s), specific relevant facts including dates, contracts, individuals involved, status of actions, and any other relevant information that prevent it from making the requested certification(s). The County reserves the right to disqualify an Offeror based upon information disclosed.

Disclosure Attached? Yes ☐

5. RELATED WORK

Offeror certifies to the best of its knowledge that, other than as disclosed in an attached separate sheet, it and its proposed subcontractors, agents, and consultants have not previously contracted with the County to perform work on or related to this project (e.g. preparing related studies or recommendations, components of the statement of work, or plans and specifications).

Disclosure Attached? Yes ☐

6. CURRENT COST OR PRICING

Offeror certifies to the best of its knowledge that cost and/or pricing data submitted with this offer, or specifically identified by reference if actual submission of the data is impracticable, are accurate, complete, and current as of the date signed below.

7. INDEPENDENT PRICING

Offeror certifies that in relation to this offer:

7.1. The prices in this offer have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with other offerors, with any competitors, or with any County employee(s) or consultant(s) involved in this or related procurements;

7.2. Unless otherwise required by law, the prices that have been quoted in this offer have not been knowingly disclosed by the Offeror and will not knowingly be disclosed by the Offeror prior to opening, in the case of a bid, or prior to award, in the case of a proposal, directly or indirectly to any other Offeror or to any competitor or with any County employee(s) or consultant(s) involved in this or related procurements; and

7.3. No attempt has been made or will be made by the Offeror to induce any other person or firm to submit or not to submit an offer for the purpose of restricting competition.

8. ADDITIONAL DISCLOSURES

Offeror shall report in writing to the County Department of Purchasing and Contracting within five business days of discovering or having any reason to suspect any change in status as certified in the preceding paragraphs. Upon County's request, Offeror shall provide additional information supporting Offeror's Representations and Certifications. Offeror's obligations under this Section 8 shall continue until Offeror is no longer under consideration for award of a contract, or until termination or expiration of any resulting contract(s).

CERTIFICATION

The information furnished in Paragraphs 1 through 8 and in the accompanying offer is certified to be factual and correct as of the date submitted and this certification is made under penalty of perjury under the laws of the State of California.

Name: _____ Signature: _____

Title: _____ Date: _____

Company/Organization: _____

SUBMIT THIS FORM AS DIRECTED IN THE REQUEST FOR SOLICITATION DOCUMENTS OR WITH THE OFFER

DESIGNATION OF SUBCONTRACTORS

Set forth below is the full name and the location of the place of business of each Subcontractor whom the Bidder proposes to subcontract portions of the work in excess of one-half of one percent of the total bid, or, in the case of construction of streets or highways, including bridges, in excess of one-half of one percent of the total bid or \$10,000, whichever is greater, and the portion of the work which will be done by each Subcontractor for each subcontract.

The Bidder's attention is directed to the provision titled "Subcontracting" of the Special Provisions contained in these Contract Documents.

NOTE: The Bidder understands that if the Bidder fails to specify a Subcontractor for any portion of the work to be performed under the contract in excess of one-half of one percent of the bid, or, in the case of construction of streets or highways, including bridges, in excess of one-half of one percent of the bid or \$10,000, whichever is greater, the Bidder shall be deemed to have agreed to perform such portion, and that the Bidder shall not be permitted to sublet or subcontract that portion of the work except in cases of public emergency or necessity, and then only after a finding, reduced to writing as a public record of the Awarding Authority, setting forth the facts constituting the emergency or necessity in accordance with the provision of the Subletting and Subcontracting Fair Practices Act (Section 4100 et seq. of the California Public Contract Code).

The "Business Name and Address", the "License No.", and the "Portion of Work to be Subcontracted" that will be done by each Subcontractor (including DVBE Subcontractors) are required at the time of bid submittal. An inadvertent error in listing the California contractor license number must be corrected by the prime contractor within 24 hours after bid opening by email to the Procurement Contracting Officer listed as contact for this RFB, provided the corrected contractor's license number corresponds to the submitted name and location for that subcontractor, or else the bid may be determined non-responsive. The remainder of the information shall be submitted by all bidders within two business days of bid opening by e-mail to said Procurement Contracting Officer.

If no Subcontractors are to be employed on the project, enter the word "NONE."

DESIGNATION OF SUBCONTRACTORS

DESIGNATION OF SUBCONTRACTORS				
PORTION OF WORK TO BE SUBCONTRACTED		BUSINESS NAME AND ADDRESS	PERCENTAGE OF TOTAL CONTRACT	LICENSE NO.
ITEM NO.	DESCRIPTION OF WORK			

TOTAL % SUBCONTRACTED _____

Name of Bidder _____

FOR: LAKE SIDE EQUESTRIAN FACILITY, ORACLE PROJECT NO. 1020367.

Accompanying this proposal is _____

(NOTICE: Insert the words "cash (\$ _____)," "cashier's check," "certified check," or "bidder's bond," as the case may be.) in amount equal to at least ten percent of total of the bid.

The names of all persons interested in the foregoing proposal as principals are as follows:

IMPORTANT NOTICE *If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer and manager thereof; if a co-partnership, state true name of firm, also names of all individual co-partners composing firm; if bidder or other interested person is an individual, state first and last names in full.*

Licensed in accordance with an act providing for the registration of Contractors,

License No. _____ Classification (s) _____ Exp. Date _____

DIR Registration No. _____ Registration Date _____ Exp. Date _____

I hereby certify, under penalty of perjury, that the foregoing proposal to the Board is true and correct.

(_____)

Legal Name of Bidder

(
SIGN (
(
HERE (by _____ (SEAL)
(Signature
(
(

(_____
Title

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if bidder is a co-partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts in behalf of the co-partnership; and if bidder is an individual, his signature shall be placed above. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a Power of Attorney must be submitted with the bid; otherwise, the bid may be disregarded as irregular and unauthorized.

Business address _____

Telephone (_____) Fax(_____)

E-Mail address _____

Dated _____, 20 _____, at _____ California
BOND NO. _____

BIDDER'S BOND

KNOW ALL MEN BY THESE PRESENTS:

That we
.....
as Principal, and
.....
as Surety, are held and firmly bound unto the County of San Diego, a political subdivision of the State of California, hereinafter called the County, in the penal sum of TEN PERCENT (10%) OF THE TOTAL AMOUNT OF THE BID of the Principal above named, submitted by said Principal to the County for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

In no case shall the liability of the Surety hereunder exceed the sum of.....
.....

THE CONDITION OF THIS OBLIGATION IS SUCH,

That whereas the Principal has submitted the above-mentioned bid to the County of San Diego for certain construction specifically described as follows, for which bids are to be opened on _____ for
DATE

LAKESIDE EQUESTRIAN FACILITY, ORACLE PROJECT NO. 1020367.

NOW THEREFORE, if the aforesaid principal shall not withdraw said bid within the period specified therein after the opening of the same, or, if no period be specified, within sixty (60) days after said opening, and shall within the period specified therefor, or, if no period be specified, within ten (10) days after the prescribed forms are presented to him for signature, enter into a written contract with the County, in the prescribed form, in accordance with the bid as accepted, and file the two bonds with the County, one to guarantee faithful performance and the other to guarantee payment for labor and materials, as required by law, then this obligation shall be null and void; otherwise, it shall be and remain in full force and virtue.

In the event suit is brought upon this bond by the County and judgment is recovered, the Surety shall pay all costs incurred by the Owner in such suit, including a reasonable attorney's fee to be fixed by the court.

IN WITNESS WHEREOF, We have hereunto set our hands and seals on this day of A.D.
20.....

.....(SEAL).....
(SEAL).....
.....(SEAL).....
(SEAL).....
(SEAL).....(SEAL).....
..... Surety Principal

ATTORNEY-IN-FACT ACKNOWLEDGEMENT OF SURETY

STATE OF)
COUNTY OF) ss
On this day of in the year 20.....
before me a notary public in and for said County and State
personally appeared known to me (or proved to me on the basis of
satisfactory evidence) to be the person whose name is subscribed to the within instrument as the attorney-in-fact of
the..... the corporation named as Surety in said instrument, and acknowledged to me that he
subscribed the name of said corporation thereto as Surety, and his own name as attorney-in-fact.

NOTE: (a) Signature of those executing for
Surety must be properly acknowledged. Notary Public In and for the County of
(b) The Attorney-in-fact must attach State of
a certified copy of Power of Attorney.
California

**COUNTY OF SAN DIEGO
BIDDER/OFFER DVBE INFORMATION**

ATTACHMENT B

DATE: _____

ACTIVITY/PROJECT NO. _____

PROJECT TITLE: _____

BIDDER/OFFEROR: _____

BIDDER/OFFEROR REPRESENTATIVE: _____

ITEM NO.	DESCRIPTION OF WORK, SERVICE OR MATERIAL	NAME OF CERTIFIED DVBE (PRIME, SUBCONTRACTOR, VENDOR) TO BE USED INCLUDING ADDRESS, TELEPHONE AND CERTIFICATION NUMBER.	DOLLAR AMOUNT TO BE PAID THIS DVBE
TOTAL DOLLARS TO CERTIFIED DVBE (PRIME,/SUBCONTRACTOR/VENDOR)			\$

COMPUTATION OF UTILIZATION AND COMPARISON WITH THE GOAL

*PARTICIPATION REQUIREMENT
or ESTABLISHED
GOAL

CALCULATION

Disabled Veterans	$\frac{\text{Total Amount to DVBE}}{\text{Total Bid/Offer}} \times 100 = \text{Percent of Utilization}$ $\text{_____} \times 100 = \text{_____}\%$	<p align="center">3%</p> <p>*See DVBE information sections for details</p>
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Disabled Veteran Business Enterprise (DVBE) “Good Faith Effort” Package for Public Work (Estimated by the County) to be between \$500,000 and \$1million

The DVBE Cover Sheet is to be attached for the required certified DVBE documentation of “Good Faith Effort” and must be submitted within two business days of bid opening, offer due date, or individual task order submittal; or the bid or offer may be deemed non-responsive.

Project Title: _____

Project/Activity No.: _____

Bid/Offer No.: _____

Bid/Offer Date: _____

Name of Contractor/Firm Submitting Bid/Offer:

Please check off the following to insure you have included them in your documentation:

_____ Documentation of “Good Faith Effort” (pages 1 thru 3)

_____ Attachment of Any Additional Supporting Documentation

DOCUMENTATION OF GOOD FAITH EFFORT
For Public Work (Estimated by the County) to be between \$500,000 and \$1million

A. List potential DVBEs that the bidder/offeror solicited for participation in this contract along with dates.

Certified DVBE Firm	Date of Contact (Mail, Fax, Telephone, etc.)	Responded (Yes/No)
1. _____		
2. _____		
3. _____		
4. _____		
5. _____		
6. _____		
7. _____		
8. _____		
9. _____		
10. _____		
11. _____		
12. _____		
13. _____		
14. _____		
15. _____		

B. DVBE Solicitations

Solicitation Sample:

Bidder/Offeror must attach a sample of the solicitation sent to certified DVBE firms. If phone contact was made, document conversation: date, time, contact person, and business opportunities discussed.

DOCUMENTATION OF GOOD FAITH EFFORT
For Public Work (Estimated by the County) to be between \$500,000 and \$1million

Identification of (1) all DVBEs who submitted bids or offers. (2) nature of work, supplies or services offered which are not accepted, (3) dollar amounts of the DVBEs bids/offers not accepted, (4) subcontractors and/or suppliers who will be used instead of the DVBEs, (5) dollar amounts of these subcontractors and/or suppliers' bids/offers, and (6) the reason for the bidder/offeror not accepting the DVBE's bid/offer. Use additional sheets if necessary.

Name of DVBE (1)	Nature of Work (2)	DVBE Bids/Offer(\$) (3)	Subcontractor/Supplier to be used (4)	Bid/Offer Amount Accepted (5)	Reason Not Accepted (6)

PART2/DVBE

PART III

DOCUMENTS TO BE EXECUTED BY THE SUCCESSFUL BIDDER (AFTER AWARD OF CONTRACT)

STATE OF CALIFORNIA
COUNTY OF SAN DIEGO
CONTRACT FOR
LAKESIDE EQUESTRIAN FACILITY
ORACLE PROJECT NO. 1020367

RFB NO.: 10161

THIS CONTRACT, made and concluded, in duplicate, this _____ day of _____, Two Thousand and _____, between _____, Owner, by the Director, Department of Purchasing and Contracting, and

Contractor,

ARTICLE I. WITNESSETH, that for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the Owner, the Contractor agrees with the Owner, at the Contractor's own proper cost and expense, to do all the work and furnish all the materials, except such as are mentioned in the specifications to be furnished by the Owner, necessary to construct and complete in a good, workmanlike and substantial manner and to the satisfaction of the Owner, the project titled:

LAKESIDE EQUESTRIAN FACILITY
ORACLE PROJECT NO. 120367

Said work is to be performed in accordance with the Contract and the Special Provisions annexed hereto and including Addenda Nos. ____, ____, and ____, and also in accordance with the Standard Specifications of the State of California, Department of Transportation, current edition, Greenbook Standard Specifications for Public Works Construction, current edition, and the modifications to said Standard Specifications and said Amendments contained in Part VII of these Contract Documents.

The work to be done is shown in "Scope of Work (Base Bid and Additive Alternates)", Specifications, and Project Plans in Part VIII of these Contract Documents, in accordance with the Notice to Proceed.

ARTICLE II. And the Contractor agrees to receive and accept the unit and/or lump sum prices shown in the Bid Schedule for the items and quantities actually constructed or installed as full compensation for furnishing all materials and for doing all the work contemplated and embraced in this agreement; also for all loss or damage arising out of the nature of the work aforesaid, or from the action of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the work until its acceptance by the Owner, and for all risks of every description connected with the work; and also for all expenses incurred by or in consequence of the suspension or discontinuance of work and for well and faithfully completing the work, and the whole thereof, in the manner and according to the Plans and Specifications, and the requirements of the Engineer under them.

ARTICLE III. The Owner hereby promises and agrees with the Contractor to employ, and does hereby employ the Contractor to provide the materials and to do the work according to the terms and conditions herein contained and referred to, for the prices aforesaid, and hereby contracts to pay the same at the time, and in the manner and upon the conditions hereinafter set forth, and the Owner and the Contractor for themselves, their heirs, executors, administrators, successors, and assigns, do hereby agree to the full performance of the covenants herein contained.

ARTICLE IV. It is further expressly agreed by and between the parties hereto that should there be any conflict between the terms of this instrument and the Bid or Proposal of the Contractor, then this instrument shall control and nothing herein shall be considered as an acceptance of the terms of the Proposal conflicting herewith.

ARTICLE V. The Owner has obtained from the Director of the Department of Industrial Relations said Director's determinations of the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work for the locality in which the project is to be performed. Said determinations are on file and are available in the Office of the Department of Purchasing and Contracting, 5560 Overland Ave., Suite 270, San Diego, California 92123 and are available from the Department of Industrial Relations at www.dir.ca.gov/DLSR/PWD. Not less than these rates shall be paid to all workers employed on the project.

ARTICLE VI. The Contract entered into consists of the following contract documents, all of which are component parts of the Contract as if herein set out in full, or attached hereto:

1. Notice to Contractors Inviting Bids
2. Information for Bidders
3. Proposal to the Board
4. Designation of Subcontractors
5. Contract
6. Corporate Certificate
7. Partnership Certificate
8. Contractor's Certificate Regarding Worker's Compensation
9. Performance Bond
10. Payment Bond
11. Special Provisions
12. Addenda Nos. ____, ____, and ____, as issued
13. Project Plans, Standard Plans and Standard Drawings
15. Equipment Rental Rates
16. Standard Specifications
17. General Information Regarding Compliance with Disabled Veterans Business Enterprise Program
18. Bidder DVBE Information (not required if bid does not exceed \$500,000)

All of the above named contract documents are intended to be complementary. Work required by one of the above named documents and not by others shall be performed as if required by all.

IN WITNESS WHEREOF, the parties to these presents have hereunto set their hands the day and year first above written.

BASIS OF AWARD: Bids are required for the entire work shown in the Base Bid and Additive Alternates 1, 2, 3 and 4 Bid Schedules. The lowest bid shall be the lowest total bid price (base bid and alternate additives 1-4).

TOTAL BID _____ **By** _____ **Date** _____
JOHN M. PELLEGRINO, Director
Department of Purchasing and Contracting

Contractor Name Signature of Authorized Official

Contractor Address Printed Name / Title

City, State, Zip Contractor License Number

Federal Tax ID / SS

CORPORATE CERTIFICATE

I, _____ certify that I am the Secretary of the Corporation named as Contractor in the foregoing Contract; that _____, who signed said Contract on behalf of the Contractor, was then _____ of said Corporation; that said Contract was duly signed for and in behalf of said Corporation by authority of its governing body and is within the scope of its corporate powers.

Corporate Name: _____

Signature: _____ (Corporate Seal)
Secretary

PARTNERSHIP CERTIFICATE

STATE OF _____)
COUNTY OF _____) ss

On this _____ day of _____, in the year 20____, before me _____, a Notary Public in and for said County and State, personally appeared _____, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person that executed this instrument, on behalf of the partnership and acknowledged to me that the partnership executed it.

Notary's Signature: _____

Notary's Name: _____
(Type or Print)

My Commission Expires: _____

(Notary Seal)

CONTRACTOR'S CERTIFICATE REGARDING WORKER'S COMPENSATION

Section 3700 of the Labor Code provides in part as follows:

"Every employer except the State shall secure the payment of compensation in one or more of the following ways:

- (a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this State.
- (b) By securing from the Director of Industrial Relations a certificate of consent to self-insure, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his employees..."

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

SIGNATURE: _____

BIDDER'S NAME: _____
(Type or Print)

ADDRESS: _____

(In accordance with Article 5, commencing at Section 1860, Chapter 1, Part 7, Division 2 of the Labor Code, the above certificate must be signed and filed with the awarding body prior to performing any work under this contract.)

PERFORMANCE BOND

(Page 1 of 2)

WHEREAS, the County of San Diego (hereinafter designated as COUNTY) and _____ (hereinafter designated as PRINCIPAL) have entered into a Contract for the furnishing of all materials, labor, services and equipment necessary, convenient and proper to:

**LAKESIDE EQUESTRIAN FACILITY
ORACLE PROJECT NO. 1020367; RFB 10161.**

pursuant to said Contract awarded on _____; and all of the documents attached thereto and incorporated by reference, becoming a part of said Contract, are hereby referred to and made a part hereof; and,

WHEREAS, said PRINCIPAL is required according to the terms of said Contract and applicable California State law, to furnish a Bond for the faithful Performance of said Contract.

NOW, THEREFORE, we, the PRINCIPAL and _____ as SURETY, are held and firmly bound unto the COUNTY in the penal sum of:

_____ Dollars (\$ _____), lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said PRINCIPAL, its subcontractors, heirs, executors, administrators, successors or assigns shall in all things stand to and abide by, and well and truly keep and perform all of the covenants, conditions, and agreements in said Contract and any and all alterations thereof made as therein provided, on its or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall defend, indemnify and save harmless the COUNTY, its officers, agents, and employees, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

And said SURETY for value received, hereby stipulates and agrees that no change, extension of time, alteration, addition or deletion to the terms of said Contract, the accompanying Contract Documents, or to the Work to be performed hereunder shall in any way affect its obligations on this Bond, and the SURETY hereby waives notice of any such change, extension of time, alteration, addition or deletion to the terms of said Contract or to the Contract Documents or to the Work.

In the event the COUNTY terminates the PRINCIPAL's right to complete the Contract, the SURETY shall be obligated, without duplication, for:

- (a) the responsibilities of the PRINCIPAL for correction of defective work and completion of the Contract
- (b) additional legal, design, professional and delay costs resulting from the PRINCIPAL's default, and resulting from the actions or failure to act of the SURETY under this Bond
- (c) damages, including liquidated damages, as specified in the Contract.

In the event of such termination, the COUNTY may, at its sole option:

- (a) collect payment under this Bond and take over and prosecute the Contract to completion by contract or by any other methods it may deem advisable,
- (b) require the SURETY to undertake to perform and complete the Contract itself, through its agents or through independent contractors, or
- (c) require the SURETY, through a process acceptable to the COUNTY, to obtain bids or negotiated proposals from qualified contractors acceptable to the COUNTY for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the COUNTY and the contractor selected with the COUNTY's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to the COUNTY the amount of damages, including actual and liquidated damages, incurred in excess of the balance of the Contract price as a result of the PRINCIPAL's default.

BOND NO. _____

PERFORMANCE BOND

(Page 2 of 2)

In the event suit is brought upon this Bond by the COUNTY and judgment is recovered, SURETY shall pay all costs incurred by the COUNTY in such suit, including reasonable attorneys' fees to be fixed by the court in accordance with applicable statutory law.

The SURETY, by the execution of this Bond, represents and warrants that this Bond has also been duly executed by the PRINCIPAL with proper authority, and the SURETY hereby waives any defense which it might have by reason of any failure by the PRINCIPAL to execute or properly execute this Bond.

IN WITNESS WHEREOF _____ identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the PRINCIPAL and SURETY above named on the _____ day of _____, 20____.

PRINCIPAL:

Signature

Name

Title

Address

SURETY:

Signature

Name

Title

Address

NOTE TO SURETY COMPANY AND/OR SURETY COMPANY ATTORNEY-IN-FACT:

The following form of original acknowledgement should be used. If any other form of acknowledgement is used, there must be submitted a certified copy of unrevoked resolution of authority for the attorney-in-fact.

STATE OF CALIFORNIA)
COUNTY OF SAN DIEGO) ss.

On _____, before me, the undersigned, a Notary Public in and for the State, personally appeared _____, known to me to be the duly authorized Attorney-in-Fact of the corporate SURETY named in the within instrument, known to me to be authorized to execute that instrument on behalf of said corporation, known to me to be the person whose name is subscribed to such instrument as the Attorney-in-Fact of said corporation, and acknowledged to me that he (she) subscribed the name of said corporation thereto as SURETY, and his (her) own name as Attorney-in-Fact and that said corporation executed the same.

WITNESS MY HAND AND OFFICIAL SEAL:

(SEAL)

Notary Public for the State of California

Original Acknowledgement by Attorney-in-Fact must be attached.
Corporate seals of PRINCIPAL and SURETY must be attached.

BOND NO. _____

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That

WHEREAS, the County of San Diego, a political subdivision of the State of California (hereinafter designated as Owner) on

.....20.....awarded to

..... (hereinafter designated as the Principal) a contract for the work described as follows:

LAKESIDE EQUESTRIAN FACILITY; ORACLE PROJECT NO. 1020367

WHEREAS, said Principal is required Chapter 5 (commencing at Section 3225) and Chapter 7 (commencing at Section 3247), Title 15, Part 4, Division 3 of the California Civil Code to furnish a bond in connection with said contract.

NOW THEREFORE, We, the Principal and
as Surety, are held and firmly bound unto the Owner in the penal sum of Dollars (\$)

lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT if said Principal, hers/his/its subcontractors, heirs, executors, administrators, successors, or assigns, shall fail to pay any of the persons named in Section 9100 of the California Civil Code, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract, or for any amounts required to be deducted, withheld and paid over to the Employment Development Department from the wages of employees of the contractor and his subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such work and labor the Surety or Sureties will pay for the same, in an amount not exceeding the sum hereinabove specified, and also, in case suit is brought upon this bond, a reasonable attorney's fee, to be fixed by the court.

This Bond shall inure to the benefit of any of the persons named in Section 9100 of the California Civil Code, so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

It is further stipulated and agreed that the Surety on this bond shall not be exonerated or released from the obligation of this bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement hereinabove described or pertaining or relating to the furnishing of labor, materials or equipment therefor, nor by any change or modification of any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement hereinabove described, nor by any rescission or attempted rescission of the contract, agreement or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the Owner or Public Entity and original contractor or on the part of any obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Section 9100 of the California Civil Code, and has not been paid the full amount of his claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

IN WITNESS WHEREOF this instrument has been duly executed by the Principal and Surety above named, on the day of 20.....

..... (SEAL)
Principal

By (SEAL)

NOTE: (a) Signature of those executing for
Surety must be properly acknowledged.
(b) The Attorney-in-fact must attach
a certified copy of Power of Attorney.

..... (SEAL)

By (SEAL)

Attorney-in-Fact

(Attach required acknowledgements)

PART IV
SPECIAL PROVISIONS - SPECIAL CONDITIONS
(AMENDED)

**COUNTY OF SAN DIEGO
SPECIAL PROVISIONS
FOR
CONSTRUCTION OF
LAKESIDE EQUESTRIAN FACILITY
ORACLE PROJECT NO. 1020367**

PART IV - SPECIAL CONDITIONS

1. Specifications and Plans

The work embraced herein shall conform to the provisions in the Standard Specifications of the State of California, Department of Transportation, current edition; the modifications to said Standard Specifications and said Amendments contained in Part VII of these Contract Documents, insofar as the same may apply and these Special Provisions.

2. Beginning of Work, Time of Completion and Liquidated Damages

The Contractor's attention is directed to Section 8-1.04, "Start of Jobsite Activities" and Section 8-1.10, "Liquidated Damages" of the Standard Specifications, defining responsibility with regard to completing the work within the time specified.

The Contractor shall begin work within fifteen (15) calendar days after receiving the Notice to Proceed and shall diligently prosecute this Contract to completion before expiration of **two hundred fifty-one (251) working days** starting on the 15th day after receipt of said notice by the Contractor.

In case all the work called for and all the conditions and requirements of the Contract are not completed within the number of working days specified above, liquidated damages of **one thousand nine hundred dollars (\$1,900)** for each and every calendar day required to finish the work in excess of the specified number of working days shall be paid to the Owner.

3. Project Document Identification and Mailing Information

All correspondence and all other documents submitted to the Owner for this project shall contain the project title and the number as shown at the top of this page. Documents referred to include, but are not limited to: payrolls, separate payroll certification sheets, Certificates of Insurance, other required forms and submittals. Documents which are not properly identified will be returned to the Contractor.

After award of the Contract ALL correspondence, submittals, etc. for this project are to be addressed to:

DEPARTMENT OF PARKS AND RECREATION
5500 OVERLAND AVENUE, SUITE 410
SAN DIEGO, CA 92123
ATTN: IESZIC FORMELLER, PARK PROJECT MANAGER

4. Guarantee

All work shall be guaranteed by the Contractor for a period of one (1) year from the date of acceptance of the work, against defective workmanship and materials furnished by the Contractor. The Contractor shall promptly replace or repair in a manner satisfactory to the Owner, any such defective work, after notice to do so from the Owner, and upon the Contractor's failure to make such replacement or repairs promptly, the Owner may perform this work and the Contractor, and its sureties shall be liable for the cost thereof.

5. Indemnification and Insurance

Attention is directed to Section 7-1.05, "Indemnification" and Section 7-1.06 "Insurance", of the Standard Specifications, including the "Modifications..." in Part VII of these Contract Documents.

6. Permits and Licenses

Attention is directed to Section 5-1.20B, "Permits, Licenses, Agreements, and Certifications", of the Standard Specifications and these Special Provisions.

The Contractor is required to obtain all permits as required in the project scope.

The Contractor is required to obtain a traffic control permit from the Traffic Engineering Section of the County of San Diego. There is no fee for this permit.

7. Existing Utilities and Non-Highway Facilities

Attention is directed to Section 5-1.36D, "Non-Highway Facilities", of the Standard Specifications and these Special Provisions.

The Contractor's attention is directed to underground facilities marked on the plans.

The Contractor shall take special care to avoid either damage or interruption of service during construction.

The Contractor shall ascertain the exact location of underground facilities and improvements within the construction area before using equipment that may damage such facilities or interfere with their service.

At least 48 hours before starting excavation, the Contractor shall verify the location of existing underground facilities by contacting Underground Service Alert (1-800-422-4133) and by individually contacting operators of gravity sewer systems and certain other utilities which are not members of Underground Service Alert.

In accordance with Section 4215 of the Government Code, if the Contractor while performing the contract discovers any existing main or trunkline utility facilities not identified by the public agency in the Contract Plans or Specifications, the Contractor shall immediately notify the public agency and utility in writing. The public utility, where they are the owner, shall have the sole discretion to perform repairs or relocation work or permit the Contractor to do such repairs or relocation work at a reasonable price.

An appropriate time extension will be allowed, and the Contractor shall not be assessed liquidated damages for delay in completion of the project, when such delay was caused by the failure of the public agency or the owner of the utility to provide for removal or relocation of such utility facilities.

The Contractor shall be compensated for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Plans and Specifications with reasonable accuracy and for equipment on the project necessarily idled during such work. Such compensation shall be at force account in accordance with the extra work provisions of the Contract.

Full compensation for conforming to the requirements of this provision, not otherwise provided for, shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefore.

8. Subcontracting

Attention is directed to Section 5-1.03, "Subcontracting", of the Standard Specifications, the modifications to said Section 5-1.03 contained in Part VII of these Contract Documents, and these Special Provisions.

The following definitions and requirements shall apply to any subcontract, supplier and equipment rental agreements entered into by the prime contractor relating to this project:

a. Definitions

"Subcontractor": A person, firm or corporation supplying labor and materials or equipment, or labor only, for work at the project for and under separate contract or agreement with, the Contractor.

Each Subcontractor shall be properly licensed by the State of California to perform the contemplated subcontract work.

"Work at the Project": Work to be performed at the location of the project, and any offsite work performed exclusively for the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor or any Subcontractor.

"Owner-Operator": A person who has legal or equitable title to equipment and operates the equipment on work at the project; operates only that equipment to which said person has legal or equitable title, has no employees (except where necessary to assist in operating the equipment) and has only one piece of equipment at the project at any one time.

For the purpose of this Contract, owner-operators are considered to be employees of the Contractor or the Subcontractor which engaged their services.

"Incorporated Owner-Operator": A corporation which owns, operates, and maintains one or more items of equipment and rents out the equipment, operated and maintained, for work at the project. For the purpose of this Contract, an incorporated owner-operator is considered to be an equipment rental firm.

"Equipment Rental Firm": A person (other than owner-operator), firm or corporation which rents

out equipment, operated and maintained, for work at the project.

For the purpose of this Contract, an equipment rental firm is considered to be a Subcontractor with regard to labor provision only.

"Supplier": A person, firm, or corporation which furnishes materials and supplies to the project from a commercial or industrial source.

"Labor Provisions": Any requirement regarding wage rates, hours of work, travel and subsistence payments, records, apprentices, safety and health, affirmative action requirements and equal employment opportunity, as set forth in the Contract Documents, or as required by law, rules and regulations.

b. Requirements

All workers at the project shall come under the applicable labor provisions. Workers include, but are not limited to, employees of the Contractor, Subcontractors and their employees, equipment rental firm employees, and owner-operators. Workers do not include employees of suppliers solely involved in transporting materials and supplies to or from the location of the project.

The Contractor shall notify the Engineer of the name and address of each equipment rental firm which the Contractor has employed to work at the project. Such notice shall be given not later than one working day after the equipment rental firm has begun work at the project.

The Contractor shall bind, by written agreement, each equipment rental firm employed on the project to the conditions of the contract with the Owner regarding labor provisions.

Where the contract provides that the Contractor's organization shall perform contract work amounting to a specified percent of the original total contract price, the following items will be considered:

"Contractor's organization" shall be construed to include only workers employed and paid directly by the Contractor and equipment owned or rented by the Contractor, with or without operators.

"The Contract amount upon which the specified percent requirement is computed includes the cost of materials and manufactured products which are to be purchased or produced by the Contractor under the Contract provisions."

Any clause relating to attorney's fees contained in a subcontract shall not give rise to a cause of action by Contractor against County for indemnity as a result of Contractor's liability to pay such fees, and Contractor waives any right to seek indemnity from County for payment of attorney's fees to or on behalf of a subcontractor.

9. Claims and Disputes

All claims must comply with the False Claims Act.

Any unresolved claims (demands for monetary compensation or damages) arising or related to the performance of this contract shall be resolved by first submitting such claims to mediation, prior to their being taken to formal arbitration or litigation by any party. Any claim which is not

resolved by mediation shall be resolved by arbitration pursuant to Section 9-1.22, "Arbitration", of the Standard Specifications.

Mediation shall be initiated by filing a written notice requesting mediation. All such claims shall be filed and documented in conformance with Section 9-1.17D "Final Payment and Claims", of the Standard Specifications. All mediation shall terminate not later than 180 days after the date of service in person or by mail on the Contractor of the final written decision by the Department on the claim. Mediation of any claim shall not relieve the Contractor of the requirement to file a Complaint in Arbitration within the time period specified in Section 9-1.17C, "Proposed Final Estimate", of the Standard Specifications, as modified in Part VII of these Contract Documents.

The County shall have the right to terminate the contract for cause or convenience at any time without regard to mediation.

Mediation shall be conducted utilizing the American Arbitration Association, or by any other neutral organization agreed to by the parties. The organization conducting the mediation shall hereinafter be known as "Administrator".

1. Costs

The costs for all mediation, including the administrative fees and Mediator compensation, shall be shared equally by all parties. Fees shall be jointly negotiated by all parties directly with the Administrator. The expenses of witnesses for any party shall be paid by the party producing such witnesses.

2. Selection of Mediator

A single mediator, acceptable to all parties, shall be used to mediate the dispute. The mediator will be knowledgeable in construction aspects and will be selected from lists furnished by the Administrator. The initial mediation session shall commence within 30 days of filing, unless otherwise agreed by the parties, or at the direction of the mediator.

3. Conduct of Mediation Sessions

All mediation sessions shall be conducted after the project is field complete unless a claim exceeds \$25,000 and the project has in excess of four months remaining until field completion, or unless all parties agree to immediate mediation. Mediation hearings will be conducted in an informal manner and discovery will not be allowed unless agreed to by all parties. All discussions, statements or admissions will be confidential to the proceedings and may not be used for any other purpose as it relates to the party's legal position.

Spokesperson shall be limited to owner, contractor, subcontractor and supplier personnel and their consultants. The contractor, subcontractor or supplier may have an attorney present and shall advise the other parties no less than five (5) working days before the mediation so that the other parties may also have their attorneys present.

Any resultant agreements from mediation shall be documented in writing, as agreed upon during the mediation, and may be used as the basis for a change order or other directive as appropriate. All mediation results and documentation shall be non-binding and inadmissible for any purpose in any legal proceeding, unless such admission is otherwise agreed in writing by all parties. Mediators shall not be subject to any subpoena or liability

and their actions shall not be subject to discovery.

4. Contract Interpretation Disputes

Should it appear to Contractor that Work to be performed or any of the matters relative to the Contract (including without limitation Drawings or Specifications, if any, provided by County) are not satisfactorily detailed or explained therein, or should any questions arise as to the meaning or intent of Contract (including without limitation Drawings or Specifications, if any), Contractor shall first be required to seek an informal resolution to the dispute. Contractor shall bear all costs incurred in giving notice. County will render a determination regarding the issue, which shall be final. If Contractor disagrees with County's decision, or if Contractor contends that County failed to provide a decision, Contractor's sole and exclusive remedy is to file a Claim in accordance with this Section. Contractor shall diligently prosecute the Disputed Work (as defined below) to final completion pending resolution of any Claim.

5. Work Disputes

If a dispute arises under the Contract respecting the true value of any Work performed, the performance or implementation of Work required by Contract, any Work omitted, any extra Work that Contractor may be required to perform or time extensions, respecting the size of any payment to Contractor during the performance of Contract, or of compliance with Contract procedures, Contractor shall first be required to seek an informal resolution to the dispute. Contractor shall bear all costs incurred in giving notice. County will render a determination regarding the issue, which shall be final. If Contractor disagrees with County's decision, or if Contractor contends that County failed to provide a decision, Contractor's sole and exclusive remedy is to file a Claim. Contractor shall diligently prosecute the Disputed Work (as defined below) pending resolution of any Claim.

The claim notice and documentation procedure described in this Section applies to all claims and disputes arising under the Contract, including without limitation, any claim or dispute by any Subcontractor or material supplier.

A voucher, invoice, proposed change, application for payment, cost proposal, request for information ("RFI"), substitution request, Change Order request, or other routine or authorized form of request for payment is not a claim under the Contract. If such request is disputed as to liability or amount, then the disputed portion of the submission may be converted to a Claim under the Contract by submitting a separate Claim in compliance with claim submission requirements.

The provisions of this Section survive termination, breach or completion of the Contract, and constitute a claims procedure by agreement under Government Code Section 930.2. Contractor shall bear all costs incurred in the preparation and submission of a Claim.

6. Informal Dispute Resolution Procedure

Should any clarification, determination, action or inaction by County or County consultants, Work, or any other event, in the opinion of Contractor, exceed the requirements of or not comply with the Contract, or otherwise result in Contractor seeking additional compensation in time or money for any reason (collectively "Disputed Work"), then Contractor, before commencing the Disputed Work, or within fourteen (14) days after Contractor's first knowledge of the Disputed Work, whichever is earlier, shall give County

written notice thereof and a cost proposal for the Disputed Work stating clearly and in detail its objection and reasons for contending the Work or interpretation is outside the requirements of the Contract. Contractor and County shall make good faith attempts to resolve informally any and all such issues, claims and/or disputes. If a written notice and cost proposal for the Disputed Work is not issued within this time period, or if Contractor proceeds with the Disputed Work without first having given the notice required by this Section, Contractor shall waive its rights to further claim on the specific issue.

County will review Contractor's timely notice and cost proposal for Disputed Work and provide a decision within thirty (30) days. If, after receiving the decision, Contractor disagrees with it or still considers the Disputed Work required of it to be outside of the requirements of the Contract, it shall so notify County, in writing, within fourteen (14) days after receiving the decision by submitting a Notice of Potential Claim, that a formal Claim will be issued. Within thirty (30) days of receiving the decision, Contractor shall submit its Claim in the form specified herein and all arguments, justification, cost or estimates, schedule analysis, and detailed documentation supporting its position. Contractor's failure to furnish notification within fourteen (14) days and all justifying documentation within thirty (30) days will result in Contractor waiving its right to the subject Claim. Claims or claim updates stating that damages, total damages (direct and indirect), schedule input and/or any time extension will be determined at a later date shall not comply with this Section and shall result in Contractor waiving its Claim(s).

Claims shall be calculated in the same manner as Change Orders. EXCEPT WHERE PROVIDED BY LAW, OR ELSEWHERE IN THIS CONTRACT (IF APPLICABLE), COUNTY SHALL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES, AND CLAIMS SHALL NOT INCLUDE SPECIAL OR CONSEQUENTIAL DAMAGES.

If Contractor fails to file a Claim within the time required, then Contractor's sole remedy is to file an application for leave to file a late claim pursuant to Government Code section 930.4.

7. Claim Format

All Claims must be in writing and sent to County by registered or certified mail, return receipt requested. The Claim submitted by Contractor shall include, but not be limited to, the following: (a) A cover letter and certification under penalty of perjury of the accuracy of the contents of the Claim; (b) A summary of the Claim including underlying facts, entitlement, schedule analysis, quantum calculations and Contract provisions supporting relief; (c) A list of documents relating to the Claim including Specifications, Drawings, Requests for Clarification/RFIs, schedules, notices of delay, cost calculations and spreadsheets, and any other relevant documents; (d) A chronology of events and correspondence; (e) An analysis of Claim merit; (f) An analysis of Claim cost; and (g) All supporting documents referenced in (c).

8. Reserved

9. Exclusive Remedy

Contractor's performance of its duties and obligations specified in this Section and submission of a Claim as provided in this Section is Contractor's sole and exclusive remedy for disputes of all types pertaining to the payment of money, extension of time, the adjustment or interpretation of Contract terms or other contractual or tort relief arising from

Contract. This exclusive remedy and the limitation of liability (expressed herein and elsewhere throughout Contract) apply notwithstanding the completion, termination, suspension, cancellation, breach or rescission of the Work or Contract, negligence or strict liability by County, its representatives, consultants or agents, or the transfer of Work or the Project to County for any reason whatsoever. Contractor waives all claims of waiver, estoppel, release, bar, or any other type of excuse for non-compliance with the claim submission requirements. Compliance with the notice and claim submission procedures described is a condition precedent to the right to commence litigation, file a Government Code Claim, or commence any other legal action. If Contractor fails to raise any claim(s) or issue(s) in a timely protest and timely claim, then Contractor may not thereafter assert such claims(s) or issue(s) in any Government Code Claim, subsequent litigation, or legal action. County shall not be deemed to have waived any provision, if at County's sole discretion, a claim is accepted in a manner not in accord with this Section.

10. Actions by County Upon Receipt of Claim

Upon receipt of a Claim, County shall conduct a reasonable review of the Claim and, within a period not to exceed forty-five (45) days, shall provide Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed.

County and Contractor may, by mutual written agreement, extend the time periods provided in this Section.

If County needs approval from the Board of Supervisors to provide Contractor a written statement identifying the disputed portion and the undisputed portion of the Claim, and the Board does not meet within the forty-five (45) days or within the mutually agreed to extension of time following receipt of a Claim, County shall have up to three (3) days following the next duly publicly noticed meeting of the governing body after the forty-five (45) day period, or extension, expires to provide Contractor a written statement identifying the disputed portion and the undisputed portion.

11. Payment or Failure to Pay Undisputed Portion of Claim

Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after County issues its written statement. If County fails to issue a written statement within the time required, the Claim will be deemed rejected in its entirety. A Claim that is denied by reason of County's failure to have responded to the Claim, or its failure to otherwise meet the time requirements of this Section, shall not constitute an adverse finding with regard to the merits of the Claim or the responsibility or qualifications of Contractor.

12. Contractor's Dispute of Written Statement

If Contractor disputes County's written statement, or if County fails to respond to a Claim issued pursuant to this Section within the time prescribed, Contractor may within thirty (30) days from the date of County's response or, if no response was provided, from the date a response was due, demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered or certified mail, return receipt requested, County shall schedule a meet and confer conference to be held within thirty (30) days to further discuss settlement of the dispute.

13. Written Statement by County After Meet and Confer Conference

Within ten (10) business days following the conclusion of the meet and confer conference or if no meet and confer conference was requested, by the conclusion of the meet and confer period, if the Claim or any portion of the Claim remains in dispute, County shall provide Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after County issues its written statement.

14. Nonbinding Mediation

Following the conclusion of the meet and confer process, Contractor must within thirty (30) days identify in writing any portion of the Claim remaining in dispute for submission to nonbinding mediation. Contractor's failure to identify a portion of the Claim remaining in dispute shall be deemed an agreement on Contractor's part with County's written statement. County and Contractor shall share the associated costs of the nonbinding mediation equally. County and Contractor shall mutually agree to a mediator within ten (10) business days after the disputed portion of the Claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator.

Mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this Section.

If mediation is unsuccessful, Contractor may pursue other remedies available at law as to the parts of the Claim remaining in dispute. For Claims involving disputed amounts below three hundred seventy-five thousand dollars (\$375,000), County and Contractor agree that resubmission, review and informal resolution of the Claim pursuant to Public Contract Code Section 20104 et seq. shall not be required.

Unless otherwise agreed to by County and Contractor in writing, the mediation conducted pursuant to this Section shall excuse any further obligation under Section 20104.4 of the Public Contract Code to mediate after litigation has been commenced.

The Claim resolution procedures in this Section do not preclude County from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation does not resolve the parties' dispute. County may initiate arbitration by submitting a Request for Arbitration to Contractor in writing. Failure of Contractor to participate in required arbitration shall be deemed a waiver of the amounts in dispute.

15. Amounts Not Paid Timely

Amounts not paid in a timely manner as required by this Section shall bear interest at 7 percent per annum from the date payment was due.

16. Subcontractor Claims

If a Subcontractor or a lower tier subcontractor lacks legal standing to assert a Claim

against County because privity of contract does not exist, Contractor may present to County a Claim on behalf of a Subcontractor or lower tier subcontractor. A Subcontractor may request in writing, either on its own behalf or on behalf of a lower tier subcontractor, that Contractor present a Claim for Work which was performed by the Subcontractor or by a lower tier subcontractor on behalf of the Subcontractor. The Claim submitted by the Subcontractor shall comply with the requirements of the Section above. Within forty-five (45) days of receipt of this written request, Contractor shall notify the Subcontractor in writing as to whether Contractor presented the Claim to County and, if Contractor did not present the Claim, provide the Subcontractor with a statement of the reasons for not having done so. Nothing in this Section shall be deemed to make the Subcontractor or lower tier subcontractor a third-party beneficiary of this Contract, require payment of any funds to the Subcontractor or lower tier subcontractor by County, or excuse any noncompliance with the stop payment requirements set forth in the Civil Code Section 9000 et seq. If County elects to make payment directly to the Subcontractor or lower tier subcontractor whose Claim for Work is presented to County by Contractor, Contractor waives and releases any Claim it may have for funds paid to the Subcontractor or lower tier subcontractor by County.

17. Compliance

The provisions of this Section constitute a non-judicial Claim settlement procedure that, pursuant to Section 930.2 of the California Government Code, shall constitute a condition precedent to submission of a valid Claim under the California Government Code. Contractor shall bear all costs incurred in the preparation, submission and administration of a Claim. Any Claims presented in accordance with the Government Code must affirmatively indicate Contractor's prior compliance with the Claims procedure herein and the previous dispositions of the Claims asserted. Pursuant to Government Code Section 930.2, the one (1) year period in Government Code Section 911.2 shall be reduced to one hundred and fifty (150) days from either accrual of the cause of action, substantial completion or termination of the Contract, whichever occurs first; in all other respects, the Government Code shall apply unchanged.

Failure to submit and administer Claims as required in this Section shall waive Contractor's right to Claim on any specific issues not included in a timely submitted Claim. Claim(s) or issue(s) not raised in a timely protest and timely Claim submitted under this Section may not be asserted in any subsequent meet and confer conference, mediation, arbitration, Government Code Claim, or legal action.

County shall not be deemed to waive any provision under this Section, if at County's sole discretion, a Claim is administered in a manner not in accord with this Section. Waivers or modifications of this Section 4.4 may only be made through a signed Change Order approved as to form by legal counsel for both County and Contractor; oral or implied modifications shall be ineffective.

18. Filing of Government Code Claims

If Contractor still remains unsatisfied and desires to preserve its right to pursue the matter further, Contractor must then file a Claim with County, pursuant to Government Code Sections 900 et seq. or Sections 910, et seq.

10. Furnishing Materials

The Contractor's attention is directed to Section 6-2.03, "Department-Furnished Materials", of the Standard Specifications and these Special Provisions.

Materials to be furnished by the Owner are NONE.

California Public Contract Code prohibits surface mining operations which are subject to the Surface Mining and Reclamation Act of 1975 (SMARA) from selling California mined construction material to a local agency unless the operation is identified in a list referred to as the 3098 List. Contractor shall provide to the Engineer, satisfactory evidence that all California surface mined minerals (including but not limited to aggregate, sand, gravel, crushed stone, road base, fill materials, and any other mineral materials) furnished by Contractor for this project are from operations appearing on the 3098 List. The list can be viewed at the Department of Conservation's Office of Mine Reclamation (OMR) website at www.conservation.ca.gov/OMR/ab_3098_list/index.htm.

11. Stockpiling and Equipment Storage

Stockpile and equipment storage locations shall be selected by the Contractor, subject to written approval by the Engineer. When any material or equipment is to be stored outside the highway or street right of way, or other County property, the Contractor shall first obtain a written permit from the property owner on whose property the storage is to be made; and the Contractor shall file with the Engineer said permit, or a certified true copy thereof, together with a written release from the property owner absolving the County from any and all responsibility in connection with the storage of materials or equipment on said property.

The Contractor shall leave all storage areas in a neat and clean condition, satisfactory to the Engineer, and in accordance with the provisions of the storage permits. The Contractor shall create no attractive nuisance.

Full compensation for conforming to the requirements of this provision shall be considered as included in the contract price paid for the various items of work, and no additional compensation will be allowed therefor.

12. Public Safety

As modified and supplemented by these special conditions the Contractor shall provide for the safety of traffic and the public in conformance with the provisions in Section 7-1.04, "Public Safety," of the Standard Specifications and these special provisions.

The Contractor shall install temporary railing (Type K) between a lane open to public traffic and an excavation, obstacle or storage area when the following conditions exist:

- A. Excavations - The near edge of the excavation is 12 feet or less from the edge of the lane, except:
 - 1. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
 - 2. Excavations less than one foot deep.
 - 3. Trenches less than one foot wide for irrigation pipe or electrical conduit, or excavations less than one foot in diameter.

4. Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
 5. Excavations in side slopes, where the slope is steeper than 4:1 (horizontal: vertical).
 6. Excavations protected by existing barrier or railing.
- B. Temporarily Unprotected Permanent Obstacles -The work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or the Contractor, for the Contractor's convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.
- C. Storage Areas-Material or equipment is stored within 12 feet of the lane and the storage is not otherwise prohibited by the provisions of the Standard Specifications and these special provisions.

The approach end of temporary railing (Type K), installed in conformance with the provisions in this section "Public Safety" and in Section 7-1.04, "Public Safety," of the Standard Specifications, shall be offset a minimum of 15 feet from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than one foot transversely to 10 feet longitudinally with respect to the edge of the traffic lane. If the 15-foot minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 10 feet without written approval from the Engineer.

When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians.

Full compensation for conforming to the provisions in this section "Public Safety," including furnishing and installing temporary railing (Type K) and temporary crash cushion modules, shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

13. Progress Schedule

Attention is directed to Section 8-1.02C (5), "Baseline Schedule", of the Standard Specifications and these Special Provisions.

The **Contractor shall, within seven (7) working days after receiving the Notice to Proceed and prior to starting work, submit a schedule of proposed operations to the Engineer for approval.** The schedule shall outline the Contractor's proposed Order of Work, including start and completion dates of each salient feature of the work in procurement of materials, equipment, amenities, furnishings, plants, etc. per the construction documents. Upon approval of this schedule by the Engineer, the Contractor may begin work.

The progress schedule submitted shall be consistent in all respects with the time and order of work requirements of the Contract. Project schedule shall include work complete in Gantt chart format, which includes work complete and milestones for work to be completed.

As the work progresses and upon written request by the Engineer, the Contractor shall submit within five (5) working days of the date of the written request a supplementary schedule consistent with the actual progress of the work.

Subsequent to the time that submittal of a progress schedule is required in accordance with these specifications, no progress payments will be made for any work until a satisfactory schedule has been submitted to the Engineer.

If any change in the progress schedule is to be made or becomes necessary due to unforeseen circumstances, the Contractor shall so notify the Engineer immediately in writing and may, upon approval by the Engineer, change the Order of Work and/or schedule of operations.

Attention is directed to "Maintaining Traffic" of these Special Provisions regarding the work hours for this project.

Work scheduled on Saturdays, Sundays or Holiday must receive prior approval from the Engineer.

14. Survey Staking

Setting stakes shall be in accordance with Section 5-1.26, "Construction Surveys", of the Standard Specifications and these Special Provisions.

All survey staking will be performed by the Contractor.

The expense incurred in replacing said stakes, which the Contractor may have failed to preserve, including travel time, shall be borne by the Contractor.

The Contractor is required to examine carefully all construction stakes and by visual inspection of stakes and string lines, forms, and headers set therefrom, interpret and confirm that the line and grade information is in accordance with the Plans. If there is an apparent error or lack of understanding as to what is meant by the staking, the Contractor shall request an interpretation of staking from the Engineer before doing any work.

15. Trench Plating

All unrestored voids, trenches, holes, excavations, etc., that are in the pedestrian or traveled way shall be protected through the use of adequately designed barricades and structural steel plates that will support legal vehicle loads.

All plates shall provide complete coverage to prevent any person, bicycle, motorcycle or motor vehicle from being endangered due to plate movement causing separations or gaps. Plates shall be installed with anchors, with the plate surfaces reasonably smooth and all vertical edges transitioned with cold-mix.

Structural steel plates shall have a non-skid surface.

All structural steel plates placed over surface voids, such as trenches and other areas to be protected in the public right-of-way shall conform to the following:

- a. Owner's name shall be legible and permanently affixed on each plate.
- b. When steel plates are placed within the public right-of-way, the Contractor shall erect sign(s) in the immediate area of the trench plate(s) identifying its name with a 24-hour number. Minimum height of letters and numbers shall be two inches.
- c. The Contractor will immediately mobilize necessary personnel and equipment after being notified by the Engineer or the Owner's emergency services section of a repair need. This includes, but is not limited to, plate anchors, cold-mix, asphalt concrete to transition/ramp from the existing roadway or sidewalk to the plate surface and back down.
- d. Failure to respond to the emergency request within two hours will be grounds for Owner repairs that will be invoiced at double the actual cost including overhead or \$500 per incident, whichever is greater.
- e. Steel plates used for bridging must extend a minimum of 300 mm (12") beyond the edges of the trench.
- f. Steel plate bridging shall be installed to operate with minimum noise.
- g. The trench shall be adequately shored to support the bridging and traffic loads.
- h. Temporary paving with cold asphalt concrete shall be used to feather the edges of the plates, if Method (2) is used.
- i. Bridging shall be secured against displacement by using adjustable cleats, shims or other devices.

Transverse or longitudinal cuts in the right-of-way that cannot be properly completed within a work day shall be protected by structural steel plate bridging with a non-skid surface and shoring may be required to preserve unobstructed traffic flow.

As required by the Owner, structural steel plate bridging and shoring shall be installed using either Method (1) or (2):

Method (1) (For posted speeds greater than 45 mph):

The pavement shall be cold planed to a depth equal to the thickness of the plate and to a width and length equal to the dimensions of the plate. An alternate method may be used as approved by the Engineer.

Method (2) (For posted speeds equal to or less than 45 mph):

Approach plate(s) and ending plate(s) (if longitudinal placement) shall be attached to the roadway by a minimum of 2 dowels pre-drilled into the corners of the plate and 2" into the pavement. Subsequent plates are to be butted evenly (both horizontally and vertically) to each other(s). Fine graded asphalt concrete shall be compacted to form ramps, maximum slope 8.5% with a minimum 12" taper to cover all edges of the steel plates. When steel

plates are removed, the dowel holes in the pavement shall be backfilled with either graded fines of asphalt concrete mix, concrete slurry or an equivalent slurry satisfactory to the Engineer.

The Contractor shall be responsible for the maintenance of the structural steel bridging plates, shoring and asphalt concrete ramps.

Unless specifically noted, structural steel plate bridging should not exceed 4 consecutive working days in any given week, unless otherwise approved by the Engineer. Backfilling of excavations shall be covered with a minimum 3" temporary layer of cold asphalt concrete.

The following table shows the required minimal thickness of steel plate bridging required for a given trench width:

Trench Width (Feet)	Minimum Plate Thickness (Inch)
1.0	1/2
1.5	3/4
2.0	7/8
3.0	1
4.0	1-1/4

Note: For spans greater than 4 feet, a structural design shall be prepared by a Registered Civil Engineer and approved by the Owner.

Structural steel plate bridging shall be designed for HS 20-44 truck loading per Caltrans Bridge Design per Specifications Manual. The Contractor shall maintain on the steel plate a non-skid surface having a minimum coefficient of friction equivalent to 0.35 as determined by either California Test Method 342 ANSI/ASTM 3-274.

A "ROUGH ROAD" sign (W33) with black lettering on an orange background may be used in advance of structural steel plate bridging.

Full compensation for conforming to the requirements of this provision shall be considered as included in the contract price paid for the various items of work and no additional compensation will be allowed therefor.

16. Tests of Materials

The following conditions and materials, as related to this Contract, will be tested by the Owner in addition to the required manufacturers or other tests specified: relative compaction, concrete.

The Contractor shall give the Engineer written notice two (2) working days before the day on which testing services will be required.

Tests will be made by the Owner in such number and at such locations as deemed necessary by the Engineer to ensure compliance with the specifications; however, the costs of retesting any portion of the work which has failed the initial tests taken by the Owner shall be borne by the Contractor.

17. Federal and State Environmental Compliance

The Owner reserves the right to terminate, amend, or modify at any time, any item or items of work as necessary to comply with either State or Federal environmental requirements enacted after the Contract has been awarded.

If the Contract is amended or modified by contract change order as herein provided, and such changes result in additional or new items of work, the Contractor shall receive compensation for direct costs incurred in accordance with either Section 4-1.05, "Changes and Extra Work", or Section 9-1.04, "Force Account", of the Standard Specifications.

The Owner reserves the right to terminate all work under this Contract, if in the opinion of the Engineer such termination is necessary in order to comply with either State or Federal environmental requirements. In the event all work is terminated as a result of such a determination by the Engineer, the Contractor shall receive compensation for the total actual and direct costs incurred to the date of said termination, and in addition a markup of twenty percent (20%) will be paid. Such payment shall constitute full compensation for all work embraced by this Contract, and no additional compensation will be allowed therefore.

18. Control of Work

Order of work shall conform to Section 5, "Control of Work," of the Standard Specifications and these Special Provisions.

Prior to commencement of any work on the project, a Preconstruction Conference will be held at the County Engineer's office for the purpose of review and discussion of the project, progress schedule and construction procedures. At the discretion of the Engineer, periodic meetings, involving project personnel (Contractor, Utility Companies, County, or other), will be held for the purpose of coordinating project activities.

19. Dust Control

Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and free from rubbish and debris. The Contractor shall also abate dust nuisance by cleaning or sweeping, and sprinkling with water or other means as necessary. The use of water resulting in mud on public streets will not be permitted as a substitute for cleaning, sweeping, or other methods.

Full compensation for furnishing and applying water for dust control, including that caused by public traffic, shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefore.

20. Maintaining Traffic

Attention is directed to Section 7-1.03, "Public Convenience"; Section 7-1.04, "Public Safety"; and Section 12, "Temporary Traffic Control", of the Standard Specifications; and these Special Provisions.

The Contractor shall provide traffic control and warning signs and safety devices in accordance with "Part 6 - Temporary Traffic Control" of the "California Manual on Uniform Traffic Control Devices for Streets and Highways", dated 2009 and said Section 12 of the Standard

Specifications. Warning signs and safety devices shall be supplied by the Contractor. The above-referenced manual is available from the State Department of Transportation.

Whenever construction activity will disrupt or impede access to any business, the Contractor shall, by written notice, inform each affected business of the nature and expected duration of the disruptive construction activity. Such written notice shall be delivered to each affected business a minimum of two weeks prior to the start of the disruptive construction activity.

Notification:

Permittee agrees to indemnify, hold harmless and defend the County and each of its officers and employees from any liability or responsibility for accident, loss or damaged to persons or property arising by reason of the work done by permittee, or permittee's agents, employees or representatives.

Whenever construction activity will disrupt or impede access to any residence/business, the contractor shall inform each affected residence/business by written notice the nature and expected duration of the disruptive construction activity. Such written notice shall be delivered to each affected residence/business a minimum of two (2) weeks prior to the start of the disruptive construction activity.

Devices:

Actual work area shall be protected with either orange reflectorized post delineators or by barricades sufficient in number to prevent entry of both vehicles and pedestrians except as may be noted elsewhere.

Flagging:

Flagging operation shall use alternate one-way movement to pass traffic through the construction area.

Traffic shall be controlled by flaggers as required. Flaggers shall be in constant communication with each other during the flagging operation. Advance flaggers shall be positioned upstream to warn traffic when queues develop. Additional flaggers may be required at intersections.

Where the one-lane section is short enough so that each end is visible from the other end, traffic will be controlled by means of a flagger at each end of the section. They should be able to communicate with each other verbally or by means of signals. These signals should not be such as to be mistaken for flagging signals. Where the end of one-way section is not visible from the other end, the flaggers shall maintain contact by means of radio or field telephones so that a flagger may know when to allow traffic to proceed into the section.

Flaggers shall be positioned near crest of hill allowing flaggers sufficient visibility of approaching traffic. Flaggers shall be positioned so that they are easily visible to approaching traffic.

Access:

Emergency vehicle access shall be maintained at all times.

Adequate provisions shall be made for pedestrian traffic.

Adequate sight distance shall be maintained at all intersections in the vicinity of the work zone. If sight distance is affected by the traffic control, the contractor shall provide adequate distance per the County of San Diego Public Road Standards. The use of mirrors, or such devices, is not acceptable as an alternative to providing adequate sight distance.

General:

Contractor shall be responsible for supplying and maintaining all traffic control devices for both the construction area and the detour.

The Contractor shall be responsible for supplying, installing and maintaining all traffic control devices as shown on the plan along with additional traffic control devices that may be required to ensure safe movement of traffic and pedestrians through work area.

The provisions of this section may be modified or altered if, in the opinion of the Engineer, public traffic will be better served, and the work expedited. Said modifications or alterations shall not be adopted until approved in writing by the Engineer.

Any open trenches within the construction area shall be adequately protected with barricades and spoil piles to prevent entry of vehicles and pedestrians, or as indicated in the plans.

All trenches shall be back-filled and paved or plate-bridged overnight. All temporary steel plate bridging shall have non-skid surfaces. Non-skid surfaces on the temporary steel plate bridging as well as the method of installing the temporary steel plate bridging and shoring shall be as specified in Section 602.1, "Temporary Steel Plate Bridging -- With a Non-Skid Surface" of the most current Caltrans Encroachment Manual. Unless approved by the County Inspector, use of steel plate bridging shall not exceed 4 consecutive working days in any given week. At the end of every work day, steel plate bridging shall not exceed 50 feet in length, unless approved by the County Inspector. Steel plates shall have AC ramps on all edges. Open trenches are not allowed during non-working hours.

All dirt and debris shall be removed from the roadway each day before completion of work. Street must be maintained in drivable condition at all times. All dirt and debris removed shall be legally disposed of at an appropriate off-site location. Full compensation for dirt and debris removal and disposal, shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefore.

All advance warning signs, delineators, and barricades shall be removed from the roadway at the end of work each day (except W20-1 signs, if plate-bridging overnight.)

The Contractor is to replace roadway and all signing to normal conditions at the completion of work.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way at any time, including any section closed to public traffic.

Lane closures shall conform to the provisions of the Standard Specifications. The lane or lanes to be closed shall be as approved by the Engineer. The use of reflective traffic delineators to direct traffic away from excavations shall be considered as a lane closure.

The provisions in this section may be modified or altered if, in the opinion of the Engineer, public traffic will be better served, and work expedited. Said modifications or alterations shall not be adopted until approved in writing by the Engineer.

Full compensation for conforming to the requirements of these Special Provisions, and said Sections 7 and 12 of the Standard Specifications, shall be considered as included in the contract lump sum price paid for Traffic Control, and no additional compensation will be allowed therefor.

21. Sound Control Requirements

Sound control shall conform to the provisions in Section 14-8, "Noise and Vibration", Subsection 14-8.02 "Noise Control" of the Standard Specifications and these Special Provisions.

The noise level from the Contractor's operations shall conform to Chapter 4 of Division 6 of Title 3 of Section 1 (commencing with Section 36.410) of San Diego County Code relating to noise control and abatement as added by Ordinance No. 9962 (New Series). This is available at: <http://www.sdcounty.ca.gov/dplu/docs/NO.pdf>.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefore.

22. Biological Resources

Environmental Training:

Preconstruction worker environmental awareness training for construction crews will be conducted to address sensitive resources, such as ground-nesting raptors, that occur or have the potential to occur in the project area. Training will be required of each worker before they begin working on the site. Training will cover all mitigation measures included in the proposed project's Mitigation Monitoring and Reporting Program (MMRP). The Contractor shall coordinate and schedule the training with the County Project Manager. The County will retain the trainer at no additional cost to the Contractor beyond the scope of work in the construction documents.

Ground Disturbing Activities:

The Contractor shall notify the County Project Manager of the schedule for and duration of all ground-disturbing activities a minimum of five working days prior to the start of ground-disturbing activities.

Vegetation Removal and Ground-Disturbing Activities:

The Contractor shall avoid vegetation removal and ground-disturbing activities during the bird breeding season (January 15 to August 31) to mitigate impacts on nesting birds and raptors. If vegetation removal and/or ground-disturbing activities cannot be avoided during this time period, a nesting bird survey shall be conducted no more than 72 hours prior to vegetation removal and/or ground-disturbing activities by a qualified avian biologist through the entirety of the project area and required buffers zones (typically ranging from 300-feet to 900-feet, to be determined by the biologist). The biologist will be retained by the County at no additional cost to the Contractor beyond the scope of work in the construction documents. If the survey results are positive, an avoidance buffer around all active nests will be implemented during construction (typically ranging from 150-feet to 900-feet, to be determined by the qualified avian biologist). If the survey results are negative, monitoring may not be required.

If monitoring is required, nest monitoring shall occur for all active nests when construction activities are occurring adjacent to buffers. Monitoring will occur during at least the first 2 days of initial construction activities to ascertain if the buffer is sufficient. Buffer expansions will be implemented if nest disturbance is noted during monitoring. Upon establishing sufficient avoidance of nest disturbance ongoing monitoring shall be conducted at least once per week or more if determined necessary by the qualified avian biologist.

If the level of disturbance increases or significantly changes, full-time monitoring may be required again. Upon completion of work activities the monitor will survey for 1 hour on the day that work is complete. If nesting activity is observed at the nest, the nest will then be monitored on a weekly basis. If no activity is observed, the nest will be monitored the following day for 1 hour to determine nest status.

For active nests outside of construction activities and buffers no nest monitoring is required.

If construction is delayed due to monitoring requirements an appropriate time extension will be allowed and the Contractor shall not be assessed liquidated damages for delay in completion of the project, when such delay was caused by monitoring requirements.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefor.

23. Cultural Resources

Archeological Monitoring:

A qualified archaeologist shall observe all ground-disturbing activities related to the Contract. The County will retain the archeologist at no additional cost to the Contractor beyond the scope of work in the construction documents. The following measures shall be implemented:

- a) All proposed ground disturbance, including grading and excavation, will be monitored by a qualified archaeologist(s) per the County.
- b) Prior to the start of construction, a monitoring plan will be prepared with procedures to follow in the event of an unanticipated discovery, and reporting requirements.
- c) The archaeologist shall attend the pre-construction meeting to inform all personnel involved with the project of the possibility of archaeological materials being encountered during construction.
- d) If intact subsurface deposits are identified during construction, the archaeologist will be authorized to divert construction activities away from the find and will be given sufficient time to investigate and determine significance. No soil will be exported off site until a determination can be made regarding the significance of the resource specifically if Native American resources are encountered.
- e) Recovered items will be treated and curated in accordance with current professional standards per the qualified archeologist.
- f) The archeologist will provide a final report of the monitoring program and its results and will provide interpretations of any recovered cultural materials.

Protection of Human Remains:

Should human remains be identified during ground-disturbing activities related to the project, the following procedures shall be followed:

- a) No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:
 - 1) The County Project Manager is notified, and
 - 2) The County Coroner is contacted to determine that no investigation of the cause of death is required. If the Coroner determines the remains are Native American, then the Coroner will contact the Native American Heritage Commission (NAHC) to follow proper procedures.
- b) Under certain conditions, the County or its authorized representative will rebury the Native

American human remains and associated grave goods on the property in a location not subject to further disturbance.

- c) Ground penetrating radar (GPR) shall be used as part of the human remains survey and canine forensics shall be considered.
- d) Human remains are defined as:
 - 1) Fragmented or disarticulated human bone with no associated artifacts or grave goods.
 - 2) Cremations, including the soil surrounding the deposit.
 - 3) Interments, including the soils surrounding the deposit.
 - 4) Associated grave goods.

In consultation among the County archaeologist, project archaeologist, and Native American monitor, additional measures (e.g., wet-screening of soils adjacent to the deposit or on site) may be required to determine the extent of the burial.

Native American Monitoring:

A Kumeyaay tribal member shall monitor all project-related ground disturbance. The County will retain the monitor at no additional cost to the Contractor beyond the scope of work in the construction documents.

If construction is delayed due to monitoring requirements an appropriate time extension will be allowed and the Contractor shall not be assessed liquidated damages for delay in completion of the project, when such delay was caused by monitoring requirements.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefor.

24. Best Management Practices (BMPs)

The Contractor shall implement the following BMPs:

- a) Implement appropriate construction scheduling and sequencing to reduce the amount and duration of soil exposed to vehicle tracking.
- b) Limit vehicle speeds to 15 miles per hour in the project area.
- c) Conduct regular watering of roadways to prevent and alleviate dust generation, but do not apply in quantities that would allow for water ponding.
- d) Fence/flag and maintain limits of construction areas throughout the construction activities.
- e) Implement appropriate stormwater BMPs during the rainy season (October 1 to April 30) to reduce erosion and control siltation. BMPs may include the use of silt fences, fiber rolls, and organic soil tackifiers (e.g., guar gum).
- f) Require equipment to be maintained in good tune and reduce excessive idling time.
- g) Utilize alternative fueled equipment and vehicles, such as renewable diesel, renewable natural gas, compressed natural gas, or electric, when feasible.
- h) Require older equipment be retrofitted with advanced engine controls, such as diesel particulate filters, selective catalytic reduction, or cooled exhaust gas recirculation, where feasible.
- i) Make efficient use of finite natural resources. Use building and finishing products that contain locally sourced and recycled materials, where feasible.

25. Highway Construction Equipment

Attention is directed to Section 7-1.01O, "Vehicle Code", and Section 5-1.37B, "Load Limitations"

of the Standard Specifications.

26. Payments

Attention is directed to Section 9, "Payment" of the Standard Specifications and these Special Provisions.

In determining the partial payments to be made to the Contractor, only the following listed materials will be considered for inclusion in the payment as materials furnished but not incorporated in the work:

NOT APPLICABLE FOR THIS PROJECT

The cutoff date for preparation of monthly estimates shall be at the close of work on the 20th day of the month; or if the 20th day of the month falls on a non-working day, at the close of work on the latest working day prior to the 20th day of the month; or on a date mutually agreed upon by the Contractor and the Engineer. The Department shall make monthly payments to the Contractor within 30 calendar days after the monthly estimate cutoff date.

When requested by the Engineer, the Contractor shall prepare and submit for approval a breakdown estimate covering each lump sum item. The sum of the items listed in the breakdown estimate shall equal the contract lump sum price or prices. An unbalanced breakdown estimate, providing for overpayment to the Contractor on items of work which would be performed first, will not be accepted. The breakdown estimate shall be approved by the Engineer before any partial payment estimate is prepared.

For the purpose of making partial payments pursuant to Section 9-1.06, "Partial Payments", of the Standard Specifications, the amount set forth for the contract items of work hereinafter listed shall be deemed to be the maximum value of the contract item of work which will be recognized for progress payment purposes:

Partial payment to contractor shall be based on supplier's invoice to contractor. Contractor shall submit materials invoice and storage location within California with progress payment for reimbursement.

After acceptance of the contract pursuant to Section 5-1.46, "Final Inspection and Contract Acceptance", of the Standard Specifications, the amount, if any, payable for a contract item of work in excess of the maximum value for progress payment purposes hereinabove listed for the item, will be included for payment in the first estimate made after acceptance of the Contract.

27. Disposing of Materials

The Contractor shall be responsible for disposal of brush, trash, debris, and surplus materials in a safe and legal manner. Unless otherwise specified, said materials shall be disposed of outside the project limits in accordance with Section 5-1.20B(4), "Contractor – Property Owner Agreement", of the Standard Specifications.

28. Trade Names and Alternatives

Attention is directed to Section 6-3.02, "Specific Brand or Trade Name and Substitutions", of the Standard Specifications and these Special Provisions.

Whenever any material, article, or process is indicated or specified by trade, patent, or proprietary name or name of manufacturer or specified by a list of trade, patent, or proprietary names or names of manufacturers, such specifications for material, article or process, unless marked "no substitution", shall be deemed to be followed by the words "or approved equal".

29. Subsurface Investigation

Attention is directed to Section 2-1.30, "Job Site and Document Examination", of the Standard Specifications.

The following reports are available for review at and may be downloaded from the County of San Diego BuyNet website at <http://buynet.sdcountry.ca.gov>. These reports are provided for informational purposes only and are not part of this Contract:

NONE

30. Inspections & Special Inspections

The Contractor shall coordinate, schedule and facilitate all required inspections and special inspections. The Contractor shall provide the Engineer with a minimum of 72 hours advance notice of all inspections and special inspections.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefor.

31. Stormwater Pollution Prevention Plan (SWPPP)

The Contractor shall provide a project SWPPP within five (15) days of Notice to Proceed. The SWPPP shall be prepared by a Qualified Stormwater Developer and shall meet all current regulations. Regular site inspections shall be performed by a Qualified Stormwater Planner and shall meet all current regulations.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefor.

32. As-Built Construction Documents

The Contractor shall provide complete and accurate as-built documents including, but not limited to, plans and specifications for all improvements performed under the Contract within fifteen (15) days of notice of substantial completion.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work, and no additional compensation

will be allowed therefor.

33. Field Orders

Field orders are to facilitate decisions made in the field by the Resident Engineer and reduce approval delays.

The Resident Engineer is authorized to approve field orders for changes necessary for the successful completion and function of the project within the dollar limit established in the bid schedule.

The Resident Engineer will prepare a field order form for each approved change and submit such form with the next monthly progress payment. The field order form shall describe the reason the change is required, the work to be performed and the amount of compensation to be paid the Contractor. It shall also contain the Contractor's signature acknowledging that the compensation constitutes full payment for the work to be performed.

34. Public Disclosure of Gifts and Campaign Contributions

NOTE: This Special Condition does not apply to the initial contract for the project. It only applies to Contract Change Orders that require Board of Supervisor approval.

- a. San Diego County Charter Section 1000.1 requires that when a service contract is to be considered by the Board of Supervisors for approval, amendment, or extension, the Contractor and the registered lobbyists of the Contractor shall make the following disclosures:
 - 1) All gifts reportable pursuant to the provisions of the Political Reform Act to any member of the Board of Supervisors or to the immediate family of such member during the year preceding the date of the disclosure.
 - 2) All federal, State and local campaign contributions made to any member of the Board of Supervisors or his or her controlled committees during the year preceding the date of the disclosure.
 - 3) Or a disclosure that there are no gifts or campaign contributions to disclose.
- b. The Contractor's disclosure shall include gifts and campaign contributions from any natural person or entity constituting the Contractor and from any principal owner and principal officer of the Contractor.
- c. Contractor shall submit a written certification that the disclosure requirements have been complied with.
- d. This Clause does not apply to contracts between the County of San Diego and other governmental entities.
- e. The disclosure shall be made at least four (4) calendar days prior to the date of the meeting of the Board of Supervisors at which the approval, amendment, or extension is to be considered by the Board.

- f. The required written disclosure shall be filed with the Clerk of the Board of Supervisors, on a form prescribed by the Clerk. The Clerk of the Board shall make all disclosures available to the public on the County's Internet site after they are filed with the Clerk and prior to the day on which the Board acts on the service contract.
- g. Supplemental Disclosures. Gifts or campaign contributions made subsequent to the required written disclosure, but prior to the Board's decision, and any gift or campaign contribution inadvertently not included in the written disclosure, shall be disclosed in writing at the meeting of the Board of Supervisors prior to the Board's decision to approve, amend or extend the service contract.
- h. Failure to Comply. If subsequent to Board approval of an amendment or extension of the service contract, the disclosure is found to be incomplete or inaccurate due to intentional misconduct or gross negligence, the service contract may be voided at the discretion of the Board of Supervisors.
- i. Contract Voidable. If subsequent to approval, amendment or extension of this contract by the Board of Supervisors, the Board finds that the disclosure required by San Diego County Charter Section 1000.1 is substantially incomplete or inaccurate due to intentional misconduct or gross negligence of the Contractor or the Contractor's registered lobbyist, the contract may be voided at the sole discretion of the Board of Supervisors. All terms and conditions of the contract, including the County's obligation to pay for services received, shall remain in effect until the effective date of the Board's action to void the contract, and all contractual provisions set forth in the contract that by their terms survive the expiration or termination of the contract shall continue to remain in effect.
- j. Cost of Implementation. The County of San Diego's cost for implementing the disclosures required by this clause shall be paid by the Contractor at the time the initial disclosure is filed with the Clerk of the Board.
- k. Disclosure Forms are available at the Clerk of the Board's office at the County Administration Center, 1600 Pacific Highway, Room 402, San Diego, CA and on the Clerk of the Board's Internet Site <http://www.sdcountry.ca.gov/cob/index.html>. Original copies of the Disclosure Forms are to be filed at the Clerk of the Board's office.

35. Relations with California Regional Water Quality Control Board

This project lies within the boundaries of the San Diego Regional Water Quality Control Board (RWQCB).

http://www.swrcb.ca.gov/sandiego/water_issues/programs/stormwater/sd_stormwater.shtml

This project shall conform to the permits and modifications thereto. The NPDES general construction permit will not apply to projects where construction activities disturb less than 1 acre in a common plan of development. The Contractor shall maintain copies of the permits at the project site and shall make them available during construction.

The Contractor shall know and comply with provisions of Federal, State, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from the project site and areas of disturbance outside the project limits during construction. Attention is directed to Sections 7, "Legal Relations and Responsibility to the Public", as modified by the County.

Water pollution control requirements shall apply to storm water and non-storm water discharges from areas outside the project site which are directly and exclusively related to construction activities for this contract including, but not limited to, material borrow areas, staging areas, storage yards and access roads. The Contractor shall implement, inspect and maintain the required BMPs for those areas. Installing, inspecting and maintaining BMPs on areas outside the County right of way not specifically arranged and provided for by the County for the execution of this contract, will not be paid for.

Unless arrangements for disturbance of areas outside the project limits are made by the Department of Public Works and made part of this contract, it is expressly agreed that the County of San Diego assumes no responsibility whatsoever to the Contractor or property owner with respect to any arrangements made between the Contractor and property owner to allow disturbance of areas outside the project limits.

The Contractor shall be responsible for penalties assessed on the Contractor or the County as a result of the Contractor's failure to comply with the provisions in "Water Pollution Control" of these special provisions or with the applicable provisions of the Federal, State, and local regulations and requirements.

Penalties as used in this section shall include fines, penalties, and damages, whether proposed, assessed, or levied against the County or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Quality Control Act, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred in settlement for alleged violations of applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, in mitigation or to remediate or correct violations.

WITHHOLDS

The County will withhold money due the Contractor, in an amount estimated by the County, to include the full amount of penalties and mitigation costs proposed, assessed, or levied as a result of the Contractor's violation of the permits, or Federal or State law, regulations, or requirements. Funds will be withheld by the County until final disposition of these costs has been made. The Contractor shall remain liable for the full amount until the potential liability is finally resolved with the entity seeking the penalties. Instead of the withhold, the Contractor may provide a suitable bond in favor of the County to cover the highest estimated liability for any disputed penalties proposed as a result of the Contractor's violation of the permits, law, regulations, or requirements.

If a regulatory agency identifies a failure to comply with the permits and modifications thereto, or other Federal, State, or local requirements, the County will withhold money due the Contractor, subject to the following:

- A. The County will give the Contractor 30 days notice of the County's intention to withhold funds from payments which may become due to the Contractor before acceptance of the contract. Funds withheld after acceptance of the contract will be made without prior notice to the Contractor.
- B. No withholds of additional amounts out of payments will be made if the amount to be withheld does not exceed the amount being withheld from partial payments in accordance with Section 9-1.16, "Progress Payments," of the Standard Specifications.

- C. If the County has withheld funds and it is subsequently determined that the County is not subject to the entire amount of the costs and liabilities assessed or proposed in connection with the matter for which the withhold was made, the County will return the excess amount withheld to the Contractor in the progress payment following the determination. If the matter is resolved for less than the amount withheld, the County will pay interest at a rate of 6 percent per year on the excess withhold.

The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to water pollution control work. The Contractor and the County shall provide copies of correspondence, notices of violation, enforcement actions, or proposed fines by regulatory agencies to the requesting regulatory agency.

36. State Prevailing and Federal Minimum Wages

Attention is directed to Section 7-1.02K, "Labor Code", of the Standard Specifications and also to the modification of said Section contained in Part VII of these Contract Documents.

The project is a "public work" in accordance with Labor Code § 1720, et seq. It is the sole responsibility of the Contractor to ensure that all workers employed in the execution of the contract are paid the correct prevailing wage rate of wages.

State general prevailing wage rates determined by the Director of Industrial Relations for the locality in which the work is to be done, are available at the Department of Purchasing and Contracting, 5560 Overland Avenue, Suite 270, San Diego, California 92123. These wage rates are not included in the Proposal and Contract for the project. Changes, if any, to the general prevailing wage rates will be available at the same location. Said rates are also available at <http://www.dir.ca.gov/oprl/DPreWageDetermination.htm>.

Any Contractor who is awarded a public works project and intends to use a craft or classification not shown on the general prevailing wage determinations, shall be required to pay the wage rate of that craft or classification most closely related to it as shown in the general determinations effective at the time of the call for bids.

Not less than the State general prevailing rate of per diem wages and the State general prevailing rate for holiday and overtime work, as determined by the Director of the Department of Industrial Relations as determined by the Secretary of Labor, shall be paid by the Contractor and Subcontractors to all laborers and mechanics employed on the project.

GENERAL WAGE DECISION

[INSERT MOST CURRENT GENERAL PREVAILING WAGE DETERMINATION AFTER BID
OPENING]

www.dir.ca.gov/OPRL/PWD/index.htm

**REFERENCE ATTACHMENT “A”
GENERAL WAGE DECISION**

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: # CARPENTER

DETERMINATION: SD-23-31-4-2019-1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (JOURNEYPERSON)	Basic Hourly Rate	Employer Payments					Straight-Time		Overtime Hourly Rate		
		Health and Welfare	Pension	Vacation/ Holiday	Training	Other Payment	Hours	Total Hourly Rate	Daily ^a 1 1/2X	Saturday ^a 1 1/2X	Sunday & Holiday 2X
ENGINEERING CONSTRUCTION											
Carpenter (Heavy and Highway Work)	\$43.13	7.75	5.16	7.02 ^b	.62	.43	8	64.11	85.675	85.675	107.24
Bridge Carpenter (Highway Work)	43.26	7.75	5.16	7.02 ^b	.62	.43	8	64.24	85.87	85.87	107.50
Millwright	43.63	7.75	5.16	7.02 ^b	.62	.63	8	64.81	86.625	86.625	108.44
Pile Driver ^c	43.26	7.75	5.16	7.02 ^b	.57	.48	8	64.24	85.87	85.87	107.50
Diver, Wet (up to 50ft. depth) ^d	94.92 ^e	7.75	5.16	7.02 ^b	.62	.43	8	115.90	163.36	163.36	210.82
Diver, Standby ^d	47.46 ^e	7.75	5.16	7.02 ^b	.62	.43	8	68.44	92.17	92.17	115.90
Diver's Tender ^d	46.46	7.75	5.16	7.02 ^b	.62	.43	8	67.44	90.67	90.67	113.90
Assistant Tender (Diver's) ^d	43.46	7.75	5.16	7.02 ^b	.62	.43	8	64.44	86.17	86.17	107.90

DETERMINATION: SD-23-31-4-2019-1A

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

BUILDING CONSTRUCTION

Carpenter	\$38.03	7.75	5.16	7.02 ^b	.62	.10	8	58.68	77.695 ^f	77.695 ^f	96.71
Light Commercial	30.42	7.75	5.16	7.02 ^b	.62	.10	8	51.07	66.280 ^f	66.280 ^f	81.49

DETERMINATION: SD-31-741-1-2019-1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: May 31, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director - Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (JOURNEYPERSON)	Basic Hourly Rate	Employer Payments				Straight-Time		Overtime Hourly Rate		
		Health and Welfare	Pension	Vacation/ Holiday	Training	Hours	Total Hourly Rate	Daily 1 1/2X	Saturday/ Sunday 1 1/2X	Holiday 2X
Terrazzo Installer	\$40.03	7.75	5.16	4.55 ^b	0.57	8	58.06	78.075	78.075	98.09
Terrazzo Finisher	33.53	7.75	5.16	4.55 ^b	0.57	8	51.56	68.325	68.325	85.09

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet at <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Rate only applies to the first 4 daily overtime hours and the first 8 hours on Saturday; all other time is paid at the Sunday/Holiday rate.

Saturday in the same workweek may be worked at straight-time rate for the first 8 hours if the employee was unable to complete the 40 hours during the normal workweek for reasons beyond the control of the Employer, such as inclement weather. In addition, for Building Construction only, reasons can be due to major mechanical breakdown or lack of materials beyond the control of the Employer or because the employee voluntarily chooses to miss a scheduled workday, he may voluntarily work on Saturdays at straight time rate.

^b Includes Supplemental Dues.

^c An additional \$0.50 per hour when handling or working with new pressure-treated creosote piling or timber, or driving of used pressure-treated creosote piling.

^d Shall receive a minimum of 8 hours pay for any day or part thereof.

^e For specific rates over 50 ft. depth, contact the Office of the Director – Research Unit. Rates for Technicians, Manifold Operators, Pressurized Submersible Operators, Remote Control Vehicle Operators, and Remote Operated Vehicle Operators, as well as rates for Pressurized Bell Diving and Saturation Diving are available upon request.

^f Rate only applies to the first 4 daily overtime hours and the first 8 hours on Saturday; all other time is paid at the Sunday/Holiday rate.

Saturday in the same workweek may be worked at straight-time rate for the first 8 hours if the employee was unable to complete the 40 hours during the normal workweek due to inclement weather, major mechanical breakdown or lack of materials beyond the control of the Employer or because the employee voluntarily chooses to miss a scheduled workday, he may voluntarily work on Saturdays at straight time rate.

^g Saturdays in the same work week may be worked at straight-time rates if a job is shut down during the normal work week due to inclement weather, major mechanical breakdown or lack of materials beyond the control of the Employer. Work on Sunday, if it is the 7th consecutive workday, shall be paid at double (2x) the straight-time rate.

DESCRIPTION:

Engineering Construction

Refers to construction which requires a Class A license and includes bridges, highways, dams and also power plants and other heavy industrial type projects.

Building Construction

The light commercial wage rate shall not apply to institutional type buildings such as public or private schools, hospitals, libraries, museums, or post offices or other similar structures.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/oprl/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/oprl/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #DRYWALL INSTALLER/LATHER (CARPENTER)

DETERMINATION: SD-31-X-41-2019-1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

Classification (Journey person)	Basic Hourly Rate	Employer Payments					Straight-Time		Overtime Hourly Rates		
		Health and Welfare	Pension	Vacation/ Holiday ^a	Training	Other Payments	Hours	Total Hourly Rate	Daily 1 1/2X ^b	Saturday 1 1/2X ^b	Sunday and Holiday 2X
Drywall Installer/ Lather	\$33.62	\$7.75	\$5.16	\$7.93	\$0.62	\$0.55	8	\$55.63	\$72.44	\$72.44	\$89.25

DETERMINATION: SD-31-X-41-2019-1A

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020* Effective until superseded by a new determination issued by the Director of Industrial Relations. Contact the Office of the Director – Research Unit (415) 703-4774 for the new rates after 10 days from the expiration date, if no subsequent determination is issued.

Stocker/Scraper	\$12.50	\$3.75	-	\$7.93	\$0.62	\$0.20	8	\$25.00	\$31.25	\$31.25	\$37.50
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Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet at <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount for Supplemental Dues.

^b Rate applies to the first 4 daily overtime hours and to the first 8 hours on Saturday. All other overtime will be paid the Sunday and Holiday double time rate. Saturdays in the same workweek may be worked at straight-time if job is shut down during the normal work week due to inclement weather.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: # TUNNEL (OPERATING ENGINEER)

DETERMINATION: SD-23-63-3-2019-1C

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (Journey person)	Employer Payments						Straight-Time		Overtime Hourly Rate		
	Basic Hourly Rate	Health and Welfare	Pension ^c	Vacation/ Holiday ^a	Training	Other Payments	Hours	Total Hourly Rate	Daily ^b 1 1/2X	Saturday ^c 1 1/2X	Sunday/ Holiday 2X
CLASSIFICATION GROUPS^d											
Group 1	\$48.90	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$76.64	\$101.090	\$101.090	\$125.54
Group 2	\$49.68	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.42	\$102.260	\$102.260	\$127.10
Group 3	\$49.97	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.71	\$102.695	\$102.695	\$127.68
Group 4	\$50.11	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.85	\$102.905	\$102.905	\$127.96
Group 5	\$50.33	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.07	\$103.235	\$103.235	\$128.40
Group 6	\$50.44	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.18	\$103.400	\$103.400	\$128.62
Group 7	\$50.56	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.30	\$103.580	\$103.580	\$128.86
Group 8	\$51.91	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.65	\$105.605	\$105.605	\$131.56
Group 9	\$50.86	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.60	\$104.030	\$104.030	\$129.46

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount withheld for supplemental dues.

^b Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

^c Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

^d For classifications within each group, see page 24A.

^e Includes an amount for annuity.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GROUP 1

Heavy Duty Repairman Helper

GROUP 2

Skiploader (wheel type up to $\frac{3}{4}$ yd. without attachment)

GROUP 3

Chainman

Power-Driver Jumbo Form Setter Operator

GROUP 4

Dinkey Locomotive or Motorman (up to and including 10 tons)

Rodman

GROUP 5

Bit Sharpener

Equipment Greaser (Grease Truck)

Instrumentation

Slip Form Pump Operator (power driven hydraulic lifting device for concrete forms)

Tugger Hoist Operator (1 drum)

Tunnel Locomotive Operator (over 10 and up to and including 30 tons)

Welder-General

GROUP 6

Backhoe Operator (up and including $\frac{3}{4}$ yd.) Small Ford, Case or similar types

Drill Doctor

Grouting Machine Operator

Heading Shield Operator

Heavy Duty Repairman

Jumbo Pipe Carrier

Loader Operator (Athey, Euclid, Sierra and Similar types)

Mucking Machine Operator (1/4 yd - Oiler or Journeyman-Trainee required – rubber tired, rail or track type)

Pneumatic Concrete Placing Machine Operator (Hackley-Presswell or similar type)

Pneumatic Heading Shield (Tunnel)

Pumpcrete Gun Operator

Tractor Compressor Drill Combination Operator

Tugger Hoist Operator (2 drum)

Tunnel Locomotive Operator (over 30 tons)

GROUP 7

Heavy Duty Repairman-Welder Combination

GROUP 8

Party Chief

GROUP 9

Tunnel Mole Boring Machine Operator

MISCELLANEOUS PROVISIONS:

1. Operators on hoists with three drums shall received fifteen cents (15¢) per hour additional pay to the regular rate of pay. The additional pay shall be added to the regular rate and become the base rate for the entire shift.
2. All heavy duty repairmen and heavy duty repairman-welder combination shall receive one dollar (\$1.00) per hour tool allowance in addition to their regular rate of pay and this shall become their base rate of pay.
3. Employees required to suit up and work in a hazardous material environment, shall receive Two Dollars (\$2.00) per hour in addition to their regular rate of pay; and that rate shall become the basic hourly rate of pay.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #OPERATING ENGINEER

DETERMINATION: SD-23-63-3-2019-1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

Classification (Journeyperson)	Basic Hourly Rate	Health and Welfare	Pension ^c	Employer Payment			Straight-Time		Overtime Hourly Rate		
				Vacation/ Holiday ^a	Training	Other Payment	Hours	Total Hourly Rate	Daily 1 1/2X ^c	Saturday 1 1/2X ^d	Sunday/ Holiday 2X
CLASSIFICATION GROUPS ^b											
Group 1	\$47.05	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$74.79	\$98.315	\$98.315	\$121.84
Group 2	\$47.83	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$75.57	\$99.485	\$99.485	\$123.40
Group 3	\$48.12	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$75.86	\$99.920	\$99.920	\$123.98
Group 4	\$49.61	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.35	\$102.155	\$102.155	\$126.96
Group 6	\$49.83	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.57	\$102.485	\$102.485	\$127.40
Group 8	\$49.94	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.68	\$102.650	\$102.650	\$127.62
Group 10	\$50.06	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.80	\$102.830	\$102.830	\$127.86
Group 12	\$50.23	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.97	\$103.085	\$103.085	\$128.20
Group 13	\$50.33	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.07	\$103.235	\$103.235	\$128.40
Group 14	\$50.36	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.10	\$103.280	\$103.280	\$128.46
Group 15	\$50.44	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.18	\$103.400	\$103.400	\$128.62
Group 16	\$50.56	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.30	\$103.580	\$103.580	\$128.86
Group 17	\$50.73	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.47	\$103.835	\$103.835	\$129.20
Group 18	\$50.83	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.57	\$103.985	\$103.985	\$129.40
Group 19	\$50.94	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.68	\$104.150	\$104.150	\$129.62
Group 20	\$51.06	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.80	\$104.330	\$104.330	\$129.86
Group 21	\$51.23	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.97	\$104.585	\$104.585	\$130.20
Group 22	\$51.33	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.07	\$104.735	\$104.735	\$130.40
Group 23	\$51.44	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.18	\$104.900	\$104.900	\$130.62
Group 24	\$51.56	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.30	\$105.080	\$105.080	\$130.86
Group 25	\$51.73	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.47	\$105.335	\$105.335	\$131.20

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount withheld for supplemental dues.

^b For classifications within each group, see pages 26 and 27.

^c Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

^d Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

^e Includes an amount for annuity.

NOTE: For Special Shift and Multi-Shift, please see pages 27A and 27B.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at

<http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GROUP 1

Bargeman
Brakeman
Compressor Operator
Ditch Witch, With Seat Or Similar Type Equipment
Elevator Operator – Inside
Engineer-Oiler
Generator Operator
Generator, Pump Or Compressor Plant Operator
Heavy Duty Repairman Helper
Pump Operator
Signalman
Switchman

GROUP 2

Asphalt-Rubber Plant Operator (Nurse Tank Operator)
Concrete Mixer Operator - Skip Type
Conveyor Operator
Fireman
Hydrostatic Pump Operator
Oiler Crusher (Asphalt Or Concrete Plant)
PJU Side Dump Jack
Rotary Drill Helper (Oilfield)
Screening and Conveyor Machine Operator (or Similar Types)
Skiploader (Wheel Type Up To ¾ Yd. with all attachment)
Skiploader (Wheel Type Up To ¾ Yd. without attachment)
Tar Pot Fireman
Temporary Heating Plant Operator
Trenching Machine Oiler

GROUP 3

Asphalt-Rubber Blend Operator
Skid Steer (Loader, with all attachment)
Equipment Greaser (Rack)
Ford Ferguson (With Dragtype Attachments)
Helicopter Radioman (Ground)
Stationary Pipe Wrapping And Cleaning Machine Operator

GROUP 4

Asphalt Plant Fireman
Backhoe Operator (Mini-Max Or Similar Type)
Boring Machine Operator
Boring System Electronic Tracking Locator
Boxman Or Mixerman (Asphalt Or Concrete)
Chip Spreading Machine Operator
Concrete Cleaning Decontamination Machine Operator
Concrete Pump Operator (Small Portable)
Drilling Machine Operator, Small Auger Types (Texoma Super Economat,
Or Similar Types - Hughes 100 Or 200, Or Similar Types - Drilling
Depth Of 30' Maximum)
Excavator Track/Rubber Tired – with all attachments (Operating weight under
21,000 lbs)
Guard Rail Post Driver Operator
Highline Cableway Signalman
Horizontal Directional Drilling Machine
Hydra-Hammer-Aero Stomper
Hydraulic Casing Oscillator Operator – drilling depth of 30' maximum
Micro Tunneling Operator (Above Ground Tunnel)
Power Concrete Curing Machine Operator
Power Concrete Saw Operator
Power - Driver Jumbo Form Setter Operator
Power Sweeper Operator
Rock Wheel Saw/Trencher
Roller Operator (Compacting)
Screed Operator (Asphalt Or Concrete)
Trenching Machine Operator (Up To 6 Ft.)
Vacuum or Muck Truck

GROUP 5 (for multi-shift rate, see page 27-B)
Equipment Greaser (Grease Truck / Multi-Shift)

GROUP 6

Articulating Material Hauler
Asphalt or Concrete Plant Engineer
Batch Plant Operator
Bit Sharpener
Central Batch Plant – Cement Silo
Concrete Joint Machine Operator (Canal And Similar Type)
Concrete Placer Operator
Concrete Planer Operator
Dandy Digger
Deck Engine Operator
Deck Engineer

Derrickman (Oilfield Type)
Drilling Machine Operator, Bucket Or Auger Types (Calweld 100 Bucket
Or Similar Types - Watson 1000 Auger Or Similar Types - Texoma 330,
500 Or 600 Auger Or Similar Types - Drilling Depth Of 45' Maximum)
Drilling Machine Operator (Including Water Wells)
Equipment Greaser (Grease Truck)
Force Feed Loader (with a seat)
Hydraulic Casing Oscillator Operator – drilling depth of 45' maximum
Hydrographic Seeder Machine Operator (Straw, Pulp Or Seed) / Jackson Track
Maintainer, Or Similar Type / Kalamazoo Switch Tamper, Or Similar Type
Machine Tool Operator
Maginnis Internal Full Slab Vibrator
Mechanical Berm, Curb Or Gutter (Concrete Or Asphalt)
Mechanical Finisher Operator (Concrete, Clary-Johnson-Bidwell Or Similar)
Micro Tunnel System Operator (Below Ground)
Pavement Breaker Operator - Truck Mounted
Railcar Mover
Road Oil Mixing Machine Operator
Roller Operator (Asphalt Or Finish)
Rubber-Tired Earth Moving Equipment (Single Engine, Up To And
Including 25 Yds. Struck)
Self-Propelled Tar Pipelining Machine Operator
Skiploader Operator (Crawler And Wheel Type, Over ¾ Yd. And
Up To And Including 1 ½ Yds., with all attachments)
Slip Form Pump Operator (Power Driven Hydraulic Lifting Device
For Concrete Forms)
Tractor Operator - Bulldozer, Tamper-Scraper (Single Engine, Up To 100 H.P.
Flywheel And Similar Types, Up To And Including D-5 And Similar Types)
Tugger Hoist Operator (1 Drum)
Ultra High Pressure Waterjet Cutting Tool System Operator
Vacuum Blasting Machine Operator
Volumetric Mixer Operator
Welder – General

GROUP 7 (for multi-shift rate, see page 27-B)
Welder - General (Multi-Shift)

GROUP 8

Asphalt Or Concrete Spreading Operator (Tamping Or Finishing)
Asphalt Paving Machine Operator (Barber Greene Or Similar Type)
Asphalt-Rubber Distributor Operator
Backhoe Operator (Up To And Including ¾ Yd.) Small Ford, Case Or Similar
Backhoe Operator (Over ¾ yd and up to 5 cu. yds. M.R.C.)
Barrier Rail Mover (BTM Series 200 or similar types)
Cast In Place Pipe Laying Machine Operator
Cold Foamed Asphalt Recycler
Combination Mixer And Compressor Operator (Gunit Work)
Compactor Operator - Self Propelled
Concrete Mixer Operator – Paving
Crushing Plant Operator
Drill Doctor
Drilling Machine Operator, Bucket Or Auger Types (Calweld 150 Bucket Or
Similar Types - Watson 1500, 2000, 2500 Auger Or Similar Types – Texoma
700, 800 Auger Or Similar Types - Drilling Depth Of 60' Maximum)
Elevating Grader Operator
Excavator Track/Rubber Tired – with all attachments (Operating weight 21,000 lbs
-100,000 lbs)
Global Positioning System/GPS (or technician)
Grade Checker
Gradall Operator
Grouting Machine Operator
Heavy Duty Repairman
Heavy Equipment Robotics Operator
Hydraulic Casing Oscillator Operator – drilling depth of 60' maximum
Hydraulic Operated Grout Plant
Kalamazoo Ballast Regulator Or Similar Type
Kolman Belt Loader And Similar Type
Le Tourneau Blob Compactor Or Similar Type
Lo Drill
Loader Operator (Athey, Euclid, Sierra And Similar Types)
Master Environmental Maintenance Mechanic
Ozzie Padder or Similar Types
P.C. 490 Slot Saw
Pneumatic Concrete Placing Machine Operator (Hackley-Presswell Or Similar
Type)
Prentice 721E Hydro-Ax
Pumpcrete Gun Operator
Rotary Drill Operator (Excluding Caisson Type)

GROUP 8 CONT.

Rubber-Tired Earth Moving Equipment Operator (Single Engine, Caterpillar, Euclid, Athey Wagon, And Similar Types With Any And All Attachments Over 25 Yds. And Up To And Including 50 Cu. Yds. Struck)
Rubber-Tired Earth Moving Equipment Operator (Multiple Engine – Up To And Including 25 Yds. Struck)
Rubber-Tired Scraper Operator (Self-Loading Paddle Wheel Type - John Deere, 1040 And Similar Single Unit)
Self-Propelled Curb And Gutter Machine Operator
Shuttle Buggy
Skiploader Operator (Crawler And Wheel Type Over 1½ Yds. Up To And Including 6½ Yds., with all attachments)
Soil Remediation Plant Operator (CMI, Envirotech or Similar)
Soil Stabilizer and Reclaimer
Somero SXP Laser Screed
Speed Swing Operator
Surface Heaters And Planer Operator
Tie Back Drill Operator (Klemm Drill or similar types)
Tractor Compressor Drill Combination Operator
Tractor Operator (Any Type Larger Than D-5 - 100 Flywheel H.P. And Over, Or Similar - Bulldozer, Tamper, Scraper And Push Tractor, Single Engine)
Tractor Operator (Boom Attachments)
Traveling Pipe Wrapping, Cleaning And Bending Machine Operator

Trenching Machine Operator (Over 6 Ft. Depth Capacity, Manufacturer's Rating)
Trenching Machine with Road Miner Attachment (Over 6 Ft. Depth Capacity, Manufacturer's Rating – Oiler or Journeyman-Trainee required)
Ultra High Pressure Waterjet Cutting Tool System Mechanic
Water Pull (compaction)

GROUP 9 (for multi-shift rate, see page 27-B)
Heavy Duty Repairman (Multi-Shift)

GROUP 10

Backhoe Operator (Over 5 cu. yds. M.R.C.)
Drilling Machine Operator, Bucket Or Auger Types (Calweld 200 B Bucket Or Similar Types - Watson 3000 Or 5000 Auger Or Similar Types – Texoma 900 Auger Or Similar Types - Drilling Depth Of 105' Maximum)
Dual Drum Mixer
Dynamic Compactor LDC 350 or Similar types
Heavy Duty Repairman-Welder Combination
Hydraulic Casing Oscillator Operator – drilling depth of 105' maximum
Monorail Locomotive Operator (Diesel, Gas Or Electric)
Motor Patrol - Blade Operator (Single Engine)
Multiple Engine Tractor Operator (Euclid And Similar Type – Except Quad 9 Cat.)
Pneumatic Pipe Ramming Tool and Similar Types (4" and above)
Pre-Stressed Wrapping Machine Operator
Rubber -Tired Earth Moving Equipment Operator (Single Engine, Over 50 Yds. Struck)
Rubber -Tired Earth Moving Equipment Operator (Multiple Engine, Euclid, Caterpillar And Similar - Over 25 Yds. And Up To 50 Yds. Struck)
Tower Crane Repairman
Tractor Loader Operator (Crawler And Wheel-Type Over 6½ Yds.)
Welder - Certified
Woods Mixer Operator (And Similar Pugmill Equipment)

GROUP 11 (for multi-shift rate, see page 27-B)
Heavy Duty Repairman-Welder Combination (Multi-Shift)
Welder-Certified (Multi-Shift)

GROUP 12

Auto Grader Operator
Automatic Slip Form Operator
Backhoe Operation (Over 7 cu. yds. M.R.C.)
Drilling Machine Operator, Bucket Or Auger Types (Calweld, Auger 200 CA Or Similar Types - Watson, Auger 6000 Or Similar Types-Hughes Super Duty, Auger 200 Or Similar Types - Drilling Depth Of 175' Maximum)
Excavator Track/Rubber Tired – with all attachments (Operating weight 100,000 lbs - 200,000 lbs)
Hoe Ram Or Similar With Compressor
Hydraulic Casing Oscillator Operator – drilling depth of 175' maximum
Mass Excavator Operator - Less Than 750 Cu. Yds.
Mechanical Finishing Machine Operator
Mobile Form Traveler Operator
Motor Patrol Operator (Multi-Engine)
Pipe Mobile Machine Operator
Rubber-Tired Earth Moving Equipment Operator (Multiple Engine, Euclid, Caterpillar And Similar Type, Over 50 Cu. Yds. Struck)
Rubber-Tired Self-Loading Scraper Operator (Paddle-Wheel-Auger Type Self Loading-Two Or More Units)

GROUP 13

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With The Push-Pull System (Single Engine, Up To And Including 25 Yds. Struck)

GROUP 14

Canal Liner Operator
Canal Trimmer Operator
Drilling Machine Operator, Bucket or Auger types (Calweld, Auger 200 CA or similar types - Watson, Auger 6000 or similar types - Hughes Super Duty, Auger 200 or similar types - drilling depth of 300' maximum)
Geothermal Drill Rig
Remote Controlled Earth Moving Equipment Operator (\$1.00 Per Hour Additional To Base Rate)
Wheel Excavator Operator (Over 750 Cu. Yds. Per Hour)

GROUP 15

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With The Push-Pull System (Single Engine, Caterpillar, Euclid, Athey Wagon, And Similar Types With Any And All Attachments Over 25 Yds. And Up To And Including 50 Cu. Yds. Struck)
Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With The Push-Pull System (Multiple Engine - Up To And Including 25 Yds. Struck)

GROUP 16

Excavator Track/Rubber Tired – with all attachments (Operating weight exceeding 200,000 lbs)
Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With The Push-Pull System (Single Engine, Over 50 Yds. Struck)
Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With The Push-Pull System (Multiple Engine, Euclid, Caterpillar And Similar, Over 25 Yds. And Up To 50 Yds. Struck)

GROUP 17

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With The Push-Pull System (Multiple Engine, Euclid, Caterpillar And Similar Type, Over 50 Cu. Yds. Struck)
Tandem Tractor Operator (Operating Crawler Type Tractors In Tandem - Quad 9 And Similar Type)

GROUP 18

Rubber-Tired Earth Moving Equipment Operator, Operating In Tandem (Scrapers, Belly Dumps, And Similar Types In Any Combination, Excluding Compaction Units - Single Engine, Up To And Including 25 Yds. Struck)

GROUP 19

Rotex Concrete Belt Operator (Or Similar Type)
Rubber-Tired Earth Moving Equipment Operator, Operating In Tandem (Scrapers, Belly Dumps, And Similar Types In Any Combination, Excluding Compaction Units - Single Engine, Caterpillar, Euclid, Athey Wagon, And Similar Types With Any And All Attachments Over 25 Yds. And Up To And Including 50 Cu. Yds. Struck)
Rubber-Tired Earth Moving Equipment Operator, Operating In Tandem (Scrapers, Belly Dumps, And Similar Types In Any Combination, Excluding Compaction Units - Multiple Engine, Up To And Including 25 Yds. Struck)

GROUP 20

Rubber-Tired Earth Moving Equipment Operator, Operating In Tandem (Scrapers, Belly Dumps, And Similar Types In Any Combination, Excluding Compaction Units - Single Engine, Over 50 Yds. Struck)
Rubber-Tired Earth Moving Equipment Operator, Operating In Tandem (Scrapers, Belly Dumps, And Similar Types In Any Combination, Excluding Compaction Units - Multiple Engine, Euclid, Caterpillar And Similar, Over 25 Yds. And Up To 50 Yds. Struck)

GROUP 21

Rubber-Tired Earth Moving Equipment Operator, Operating In Tandem (Scrapers, Belly Dumps, And Similar Types In Any Combination, Excluding Compaction Units - Multiple Engine, Euclid, Caterpillar And Similar Type, Over 50 Cu. Yds. Struck)

GROUP 22

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With The Tandem Push-Pull System (Single Engine, Up To And Including 25 Yds. Struck)

GROUP 23

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With The Tandem Push-Pull System (Single Engine, Caterpillar, Euclid, Athey Wagon, And Similar Types With Any And All Attachments Over 25 Yds. And Up To And Including 50 Cu. Yds. Struck)
Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With Tandem Push-Pull System (Multiple Engine, Up To And Including 25 Yds. Struck)

GROUP 24

Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With The Tandem Push-Pull System (Single Engine, Over 50 Yds. Struck)
Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With The With The Tandem Push-Pull System (Multiple Engine, Euclid, Caterpillar And Similar, Over 25 Yds. And Up To 50 Yds. Struck)

GROUP 25

Concrete Pump Operator-Truck Mounted
Pedestal Concrete Pump Operator
Rubber-Tired Earth Moving Equipment Operator, Operating Equipment With The Tandem Push-Pull System (Multiple Engine, Euclid, Caterpillar And Similar Type, Over 50 Cu. Yds. Struck)

Miscellaneous provisions:

1. Operators on hoists with three drums shall receive fifteen cents (15¢) per hour additional pay to the regular rate of pay. The additional pay shall be added to the regular rate and become the base rate for the entire shift.
2. All heavy duty repairmen and heavy duty repairman-welder combination shall receive one dollar (\$1.00) per hour tool allowance in addition to their regular rate of pay and this shall become their base rate of pay.
3. Employees required to suit up and work in a hazardous material environment, shall receive Two Dollars (\$2.00) per hour in addition to their regular rate of pay; and that rate shall become the basic hourly rate of pay.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #OPERATING ENGINEER (SPECIAL SHIFT)

DETERMINATION: SD-23-63-3-2019-1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

Classification (Journeyperson)	Basic Hourly Rate	Health and Welfare	Employer Payment				Straight-Time		Overtime Hourly Rate		
			Pension ^e	Vacation/ Holiday ^a	Training	Other Payment	Hours	Total Hourly Rate	Daily 1 1/2X ^b	Saturday 1 1/2X ^c	Sunday/ Holiday 2X
CLASSIFICATION GROUPS ^d											
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Group 2	\$48.33	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$76.07	\$100.235	\$100.235	\$ 124.40
Group 3	\$48.62	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$76.36	\$100.670	\$100.670	\$ 124.98
Group 4	\$50.11	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.85	\$102.905	\$102.905	\$ 127.96
Group 6	\$50.33	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.07	\$103.235	\$103.235	\$ 128.40
Group 8	\$50.44	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.18	\$103.400	\$103.400	\$ 128.62
Group 10	\$50.56	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.30	\$103.580	\$103.580	\$ 128.86
Group 12	\$50.73	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.47	\$103.835	\$103.835	\$ 129.20
Group 13	\$50.83	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.57	\$103.985	\$103.985	\$ 129.40
Group 14	\$50.86	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.60	\$104.030	\$104.030	\$ 129.46
Group 15	\$50.94	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.68	\$104.150	\$104.150	\$ 129.62
Group 16	\$51.06	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.80	\$104.330	\$104.330	\$ 129.86
Group 17	\$51.23	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.97	\$104.585	\$104.585	\$ 130.20
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Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount withheld for supplemental dues.

^b Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

^c Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

^d For classifications within each group, see pages 26 and 27.

^e Includes an amount for annuity.

SPECIAL-SHIFT – is only when one shift is working and it is outside the regular starting times for shifts.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #OPERATING ENGINEER (MULTI-SHIFT)

DETERMINATION: SD-23-63-3-2019-1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

Classification (Journeyperson)	Basic Hourly Rate	Employer Payment					Straight-Time		Overtime Hourly Rate		
		Health and Welfare	Pension ^f	Vacation/ Holiday ^a	Training	Other Payment	Hours ^b	Total Hourly Rate	Daily 1 1/2X ^c	Saturday 1 1/2X ^d	Sunday/ Holiday 2X
CLASSIFICATION GROUPS ^e											
Group 1	\$48.05	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$75.79	\$99.815	\$99.815	\$123.84
Group 2	\$48.83	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$76.57	\$100.985	\$100.985	\$125.40
Group 3	\$49.12	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$76.86	\$101.420	\$101.420	\$125.98
Group 4	\$50.61	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.35	\$103.655	\$103.655	\$128.96
Group 5	\$50.71	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.45	\$103.805	\$103.805	\$129.16
Group 6	\$50.83	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.57	\$103.985	\$103.985	\$129.40
Group 7	\$50.93	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.67	\$104.135	\$104.135	\$129.60
Group 8	\$50.94	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.68	\$104.150	\$104.150	\$129.62
Group 9	\$51.04	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.78	\$104.300	\$104.300	\$129.82
Group 10	\$51.06	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.80	\$104.330	\$104.330	\$129.86
Group 11	\$51.16	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.90	\$104.480	\$104.480	\$130.06
Group 12	\$51.23	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.97	\$104.585	\$104.585	\$130.20
Group 13	\$51.33	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.07	\$104.735	\$104.735	\$130.40
Group 14	\$51.36	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.10	\$104.780	\$104.780	\$130.46
Group 15	\$51.44	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.18	\$104.900	\$104.900	\$130.62
Group 16	\$51.56	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.30	\$105.080	\$105.080	\$130.86
Group 17	\$51.73	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.47	\$105.335	\$105.335	\$131.20
Group 18	\$51.83	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.57	\$105.485	\$105.485	\$131.40
Group 19	\$51.94	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.68	\$105.650	\$105.650	\$131.62
Group 20	\$52.06	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.80	\$105.830	\$105.830	\$131.86
Group 21	\$52.23	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.97	\$106.085	\$106.085	\$132.20
Group 22	\$52.33	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$80.07	\$106.235	\$106.235	\$132.40
Group 23	\$52.44	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$80.18	\$106.400	\$106.400	\$132.62
Group 24	\$52.56	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$80.30	\$106.580	\$106.580	\$132.86
Group 25	\$52.73	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$80.47	\$106.835	\$106.835	\$133.20

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @

<http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount withheld for supplemental dues.

^b The third-shift shall work 6.5 hours, exclusive of meal period, for which 8 hours straight-time shall be paid at the non-shift rate, Monday through Friday.

^c Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

^d Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

^e For classifications within each group, see pages 26 and 27.

^f Includes an amount for annuity.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #BUILDING/CONSTRUCTION INSPECTOR AND FIELD SOILS AND MATERIAL TESTER

DETERMINATION: SD-23-63-3-2019-1D

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (Journey person)	Employer Payments						Straight-Time		Overtime Hourly Rate		
	Basic Hourly Rate	Health and Welfare	Pension ^d	Vacation/ Holiday ^a	Training	Other Payments	Hours	Total Hourly Rate	Daily 1 1/2X ^b	Saturday 1 1/2X ^c	Sunday/ Holiday 2X
Group 1	\$47.83	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$75.57	\$99.845	\$99.845	\$123.40
Group 2	\$49.61	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.35	\$102.155	\$102.155	\$126.96
Group 3	\$51.61	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.35	\$105.155	\$105.155	\$130.96

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount withheld for supplemental dues.

^b Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

^c Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

^d Includes an amount for annuity.

GROUP 1

Field Soils and Material Tester
Field Asphaltic Concrete (Soils and Material Tester)
Field Earthwork (Grading Excavation and Filling)
Roof Inspector
Water Proofer

Pre-Tension Concrete
Post-Tension Concrete
Structural Steel and Welding Inspector
Glue-Lam and Truss Joints
Truss-Type Joint Construction
Shear Wall and Floor Systems used as diaphragms
Concrete Batch Plant
Spray-Applied Fireproofing
Structural Masonry

GROUP 2

AWS-CWI Welding Inspector
Building/Construction Inspector
Licensed Grading Inspector
Reinforcing Steel
Reinforcing Concrete

GROUP 3

Nondestructive Testing (NDT)

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #BUILDING/CONSTRUCTION INSPECTOR AND FIELD SOILS AND MATERIAL TESTER (SPECIAL SHIFT)

DETERMINATION: SD-23-63-3-2019-1D1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (Journey person)	Employer Payments						Straight-Time		Overtime Hourly Rate		
	Basic Hourly Rate	Health and Welfare	Pension ^d	Vacation/ Holiday ^a	Training	Other Payments	Hours	Total Hourly Rate	Daily 1 1/2X ^b	Saturday 1 1/2X ^c	Sunday/ Holiday 2X
Group 1	\$48.33	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$76.07	\$100.235	\$100.235	\$124.40
Group 2	\$50.11	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.85	\$102.905	\$102.905	\$127.96
Group 3	\$52.11	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.85	\$105.905	\$105.905	\$131.96

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount withheld for supplemental dues.

^b Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

^c Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

^d Includes an amount for annuity.

GROUP 1

Field Soils and Material Tester
Field Asphaltic Concrete (Soils and Material Tester)
Field Earthwork (Grading Excavation and Filling)
Roof Inspector
Water Proofer

Pre-Tension Concrete
Post-Tension Concrete
Structural Steel and Welding Inspector
Glue-Lam and Truss Joints
Truss-Type Joint Construction
Shear Wall and Floor Systems used as diaphragms
Concrete Batch Plant
Spray-Applied Fireproofing
Structural Masonry

GROUP 2

AWS-CWI Welding Inspector
Building/Construction Inspector
Licensed Grading Inspector
Reinforcing Steel
Reinforcing Concrete

GROUP 3

Nondestructive Testing (NDT)

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #BUILDING/CONSTRUCTION INSPECTOR AND FIELD SOILS AND MATERIAL TESTER (MULTI-SHIFT)

DETERMINATION: SD-23-63-3-2019-1D2

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (Journey person)	Employer Payments						Straight-Time		Overtime Hourly Rate		
	Basic Hourly Rate	Health and Welfare	Pension ^c	Vacation/ Holiday ^a	Training	Other Payments	Hours ^b	Total Hourly Rate	Daily 1 1/2X ^c	Saturday 1 1/2X ^d	Sunday/ Holiday 2X
Group 1	\$48.83	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$76.57	\$100.985	\$100.985	\$125.40
Group 2	\$50.61	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.35	\$103.655	\$103.655	\$128.96
Group 3	\$52.61	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$80.35	\$106.655	\$106.655	\$132.96

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount withheld for supplemental dues.

^b The third-shift shall work 6.5 hours, exclusive of meal period, for which 8 hours straight-time shall be paid at the non-shift rate, Monday through Friday.

^c Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

^d Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

^e Includes an amount for annuity.

GROUP 1

Field Soils and Material Tester
Field Asphaltic Concrete (Soils and Material Tester)
Field Earthwork (Grading Excavation and Filling)
Roof Inspector
Water Proofer

Pre-Tension Concrete
Post-Tension Concrete
Structural Steel and Welding Inspector
Glue-Lam and Truss Joints
Truss-Type Joint Construction
Shear Wall and Floor Systems used as diaphragms
Concrete Batch Plant
Spray-Applied Fireproofing
Structural Masonry

GROUP 2

AWS-CWI Welding Inspector
Building/Construction Inspector
Licensed Grading Inspector
Reinforcing Steel
Reinforcing Concrete

GROUP 3

Nondestructive Testing (NDT)

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #CRANES, PILE DRIVING AND HOISTING EQUIPMENT (OPERATING ENGINEER)

DETERMINATION: SD-23-63-3-2019-1B

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (JOURNEYPERSON)	Basic Hourly Rate	Employer Payments					Straight-Time		Overtime Hourly Rate		
		Health and Welfare	Pension ^e	Vacation/ Holiday ^a	Training	Other Payments	Hours	Total Hourly Rate	Daily ^b	Saturday ^c	Sunday/ Holiday
									1 1/2X	1 1/2X	2X
Classification Groups ^d											
Group 1	\$48.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$76.14	\$100.34	\$100.34	\$124.54
Group 2	\$49.18	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$76.92	\$101.510	\$101.510	\$126.10
Group 3	\$49.47	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.21	\$101.945	\$101.945	\$126.68
Group 4	\$49.61	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.35	\$102.155	\$102.155	\$126.96
Group 5	\$49.83	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.57	\$102.485	\$102.485	\$127.40
Group 6	\$49.94	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.68	\$102.650	\$102.650	\$127.62
Group 7	\$50.06	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.80	\$102.830	\$102.830	\$127.86
Group 8	\$50.23	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.97	\$103.085	\$103.085	\$128.20
Group 9	\$50.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.14	\$103.340	\$103.340	\$128.54
Group 10	\$51.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.14	\$104.840	\$104.840	\$130.54
Group 11	\$52.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$80.14	\$106.340	\$106.340	\$132.54
Group 12	\$53.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$81.14	\$107.840	\$107.840	\$134.54
Group 13	\$54.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$82.14	\$109.340	\$109.340	\$136.54

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount withheld for supplemental dues.

^b Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

^c Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

^d For classifications within each group, see page 28A.

^e Includes an amount for annuity.

NOTE: For Special Shift and Multi-Shift, please see pages 28B and 28C.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

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GROUP 1

Engineer Oiler
Fork Lift Operator (includes Loed, Lull or similar types)

GROUP 2

Truck Crane Oiler

GROUP 3

A-Frame or Winch Truck Operator
Ross Carrier Operator (jobsite)

GROUP 4

Bridge-Type Unloader and Turntable Operator
Helicopter Hoist Operator
Snobble Unit (pin-n-go or similar type)

GROUP 5

Hydraulic Boom Truck (Pitman)
Knuckleboom
Stinger Crane (Austin-Western or similar type)
Tugger Hoist Operator (1 drum)

GROUP 6

Bridge Crane Operator
Cretor Crane Operator
Hoist Operator (Chicago Boom and similar type)
Lift Mobile Operator
Lift Slab Machine Operator (Vagtborg and similar types)
Material Hoist/Manlift Operator
Polar Gantry Crane Operator
Prentice Self-Loader
Shovel, Dragline, Clamshell Operator (over 3/4 yd and up to 5 cu yds, M.R.C.)
Silent Piler
Tugger Hoist Operator (2 drum)

GROUP 7

Pedestal Crane Operator
Shovel, Dragline, Clamshell Operator (over 5 cu yds, M.R.C.)
Tower Crane Repairman
Tugger Hoist Operator (3 drum)

GROUP 8

Crane Operator (up to and including 25 ton capacity)
Crawler Transporter Operator
Derrick Barge Operator (up to and including 25 ton capacity)
Hoist Operator, Stiff Legs, Guy Derrick or similar type (up to and including 25 ton capacity)
Shovel, Dragline, Clamshell Operator (over 7 cu yds. M.R.C.)

GROUP 9

Crane Operator (over 25 tons, up to and including 50 ton M.R.C.)
Derrick Barge Operator (over 25 tons, up to and including 50 ton M.R.C.)
Highline Cableway Operator
Hoist Operator, Stiff Legs, Guy Derrick or similar type (over 25 tons, up to and including 50 ton M.R.C.)
K-Crane
Polar Crane Operator
Self Erecting Tower Crane Operator Maximum Lifting Capacity Ten (10) Tons

GROUP 10

ABI/Fundex Machines
Crane Operator (over 50 tons, up to and including 100 ton M.R.C.)
Derrick Barge Operator (over 50 tons, up to and including 100 ton M.R.C.)
Hoist Operator, Stiff Legs, Guy Derrick or similar type (over 50 tons, up to and including 100 ton M.R.C.)
Mobile Tower Crane Operator (over 50 tons, up to and including 100 ton M.R.C.)
Shovel, Dragline, Clamshell Operator (over 10 cu. yds. M.R.C.)

GROUP 11

Crane Operator (over 100 tons, up to and including 200 ton M.R.C.)
Derrick Barge Operator (over 100 tons, up to and including 200 ton M.R.C.)
Hoist Operator, Stiff Legs, Guy Derrick or similar type (over 100 tons, up to and including 200 ton M.R.C.)
Mobile Tower Crane Operator (over 100 tons, up to and including 200 ton M.R.C.)
Tower Crane Operator and Tower Gantry

GROUP 12

Crane Operator (over 200 tons, up to and including 300 ton M.R.C.)
Derrick Barge Operator (over 200 tons, up to and including 300 ton M.R.C.)
Hoist Operator, Stiff Legs, Guy Derrick or similar type (over 200 tons, up to and including 300 ton M.R.C.)
Mobile Tower Crane Operator (over 200 tons, up to and including 300 ton M.R.C.)

GROUP 13

Crane Operator (over 300 tons)
Derrick Barge Operator (over 300 tons)
Helicopter Pilot
Hoist Operator, Stiff Legs, Guy Derrick or similar type (over 300 tons)
Hydraulically Controlled Lift Gantry Operator BCR Lift System (over 300 tons)
Mobile Tower Crane Operator (over 300 tons)

MISCELLANEOUS PROVISIONS:

1. Operators on hoists with three drums shall received fifteen cents (15¢) per hour additional pay to the regular rate of pay. The additional pay shall be added to the regular rate and become the base rate for the entire shift.
2. All heavy duty repairmen and heavy duty repairman-welder combination shall receive one dollar (\$1.00) per hour tool allowance in addition to their regular rate of pay and this shall become their base rate of pay.
3. Employees required to suit up and work in a hazardous material environment, shall receive Two Dollars (\$2.00) per hour in addition to their regular rate of pay; and that rate shall become the basic hourly rate of pay.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #CRANES, PILE DRIVING AND HOISTING EQUIPMENT (OPERATING ENGINEER) (SPECIAL SHIFT)

DETERMINATION: SD-23-63-3-2019-1B1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (JOURNEYPERSON)	Basic Hourly Rate	Employer Payments					Straight-Time		Overtime Hourly Rate		
		Health and Welfare	Pension ^c	Vacation/ Holiday ^a	Training	Other Payments	Hours	Total Hourly Rate	Daily ^b	Saturday ^c	Sunday/ Holiday
									1 1/2X	1 1/2X	2X
Classification Groups ^d											
Group 1	\$48.90	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$76.64	\$101.090	\$101.090	\$125.54
Group 2	\$49.68	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.42	\$102.260	\$102.260	\$127.10
Group 3	\$49.97	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.71	\$102.695	\$102.695	\$127.68
Group 4	\$50.11	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.85	\$102.905	\$102.905	\$127.96
Group 5	\$50.33	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.07	\$103.235	\$103.235	\$128.40
Group 6	\$50.44	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.18	\$103.400	\$103.400	\$128.62
Group 7	\$50.56	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.30	\$103.580	\$103.580	\$128.86
Group 8	\$50.73	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.47	\$103.835	\$103.835	\$129.20
Group 9	\$50.90	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.64	\$104.090	\$104.090	\$129.54
Group 10	\$51.90	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.64	\$105.590	\$105.590	\$131.54
Group 11	\$52.90	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$80.64	\$107.090	\$107.090	\$133.54
Group 12	\$53.90	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$81.64	\$108.590	\$108.590	\$135.54
Group 13	\$54.90	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$82.64	\$110.090	\$110.090	\$137.54

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @

<http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount withheld for supplemental dues.

^b Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

^c Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

^d For classifications within each group and miscellaneous provisions, see page 28A.

^e Includes an amount for annuity.

SPECIAL SHIFT – is only when one shift is working and it is outside the regular starting times for shifts.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #CRANES, PILE DRIVING AND HOISTING EQUIPMENT (OPERATING ENGINEER) (MULTI-SHIFT)

DETERMINATION: SD-23-63-3-2019-1B2

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (JOURNEYPERSON)	Basic Hourly Rate	Employer Payments					Straight-Time		Overtime Hourly Rate		
		Health and Welfare	Pension ^f	Vacation/ Holiday ^a	Training	Other Payments	Hours ^b	Total Hourly Rate	Daily ^c	Saturday ^d	Sunday/ Holiday
									1 1/2X	1 1/2X	2X
Classification Groups ^e											
Group 1	\$49.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.14	\$101.840	\$101.840	\$126.54
Group 2	\$50.18	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$77.92	\$103.010	\$103.010	\$128.10
Group 3	\$50.47	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.21	\$103.445	\$103.445	\$128.68
Group 4	\$50.61	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.35	\$103.655	\$103.655	\$128.96
Group 5	\$50.83	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.57	\$103.985	\$103.985	\$129.40
Group 6	\$50.94	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.68	\$104.150	\$104.150	\$129.62
Group 7	\$51.06	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.80	\$104.330	\$104.330	\$129.86
Group 8	\$51.23	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$78.97	\$104.585	\$104.585	\$130.20
Group 9	\$51.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$79.14	\$104.840	\$104.840	\$130.54
Group 10	\$52.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$80.14	\$106.340	\$106.340	\$132.54
Group 11	\$53.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$81.14	\$107.840	\$107.840	\$134.54
Group 12	\$54.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$82.14	\$109.340	\$109.340	\$136.54
Group 13	\$55.40	\$11.60	\$11.15	\$3.55	\$1.05	\$0.39	8	\$83.14	\$110.840	\$110.840	\$138.54

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @ <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount withheld for supplemental dues.

^b The third-shift shall work 6.5 hours, exclusive of meal period, for which 8 hours straight-time shall be paid at the non-shift rate, Monday through Friday.

^c Rate applies to the first 4 overtime hours. All other daily overtime is paid at the Sunday rate.

^d Rate applies to the first 12 hours worked. All other time is paid at the Sunday rate.

^e For classifications within each group and miscellaneous provisions, see page 28A.

^f Includes an amount for annuity.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: # LABORER AND RELATED CLASSIFICATIONS

DETERMINATION: SD-23-102-4-2019-1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County.

CLASSIFICATION ^c (JOURNEYPERSON)	Employer Payments						Straight-Time		Overtime Hourly Rate		
	Basic Hourly Rate	Health and Welfare	Pension	Vacation and Holiday	Training	Other Payments	Hours	Total Hourly Rate	Daily 1 1/2X	Saturday ^a 1 1/2X	Sunday and Holiday
LABORER: BUILDING CONSTRUCTION											
Group 1	\$32.92	7.47	8.38	5.05 ^b	.69	.48	8	54.99	71.45	71.45	87.91
Group 2	33.60	7.47	8.38	5.05 ^b	.69	.48	8	55.67	72.47	72.47	89.27
Group 3	34.31	7.47	8.38	5.05 ^b	.69	.48	8	56.38	73.535	73.535	90.69
Group 4	35.11	7.47	8.38	5.05 ^b	.69	.48	8	57.18	74.735	74.735	92.29
Group 5	37.04	7.47	8.38	5.05 ^b	.69	.48	8	59.11	77.63	77.63	96.15

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet at <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Saturdays in the same workweek may be worked at straight-time rate for the first 8 hours, if the employee was unable to complete the 40 hours during the normal workweek.

^b Includes an amount per hour worked for supplemental dues.

^c For classifications within each group, see page 29A.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or subsistence requirements for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

DETERMINATION: SD-23-102-4-2019-1
FOR BUILDING CONSTRUCTION

GROUP 1

Boring Machine Helper (Outside)
Cleaning and Handling of Panel forms
Concrete Screeding for Rough Strike-off
Concrete, Water Curing
Demolition Laborer, the cleaning of brick if performed by an
Employee performing any other phase of demolition work, and
the cleaning of lumber
Fire Watcher, Limbers, Brush Loaders, Pilers and Debris Handlers
Flagman
Laborer, General or Construction
Laborer, General Cleanup
Laborer, Jetting
Laborer, Temporary Water and Air Lines
Material Hoseman (walls, slabs, floors and decks)
Plugging, filling of shee-bolt holes; Dry packing of concrete
Rigging and Signaling
Slip Form Raiser
Filling of Cracks on any surface
Tool Crib or Tool House Laborer
Traffic Control by any method
Water Pipeline Laborer
Window Cleaner
Wire Mesh Pulling - all concrete pouring operations

GROUP 2

Asphalt Shovelers
Cement Dumper (on 1 yard or larger mixer and handling bulk cement)
Cesspool Digger and Installer
Chucktender
Chute Man, pouring concrete, the handling of the chute from readymix trucks,
such as walls, slabs, decks, floors, foundations, footings, curbs, gutters and
sidewalks
Cutting Torch Operator (Demolition)
Fine Grader, Concrete or Asphalt Paving
Pot Tender and Form man
Guinea Chaser
Headerboard Man-Asphalt
Laborer, Packing Rod Steel and Pans
Membrane Vapor Barrier Installer
Power Broom Sweepers (small)
Roto Scraper and Tiller
Sandblaster (Pot Tender)
Septic Tank Digger and Installer (Leadman)
Tank Scaler and Cleaner
Tree Climber, Faller, Chain Saw Operator, Pittsburg Chipper and similar type
brush shredders

GROUP 3

Buggymobile Man
Compactor (all types including Tamper, Barko and Wacker
Concrete Curer – Impervious Membrane and Form Oiler
Concrete Cutting Torch
Concrete Pile Cutter
Driller, Jackhammer, 2 ½ ft. drill steel or longer
Dri Pak-It Machine
Impact Wrench, Multi-Plate
Kettlemen, Potmen and men applying asphalt, lay-kold, creosote, lime caustic
and similar type materials ("applying" means applying, dipping, brushing or
handling of such materials for pipe wrapping and waterproofing)

Operators of Pneumatic, Gas, Electric tools, Vibrating Machines, Pavement Breakers,
Air Blasting, Come-Alongs, and similar mechanical tools not separately classified
herein Pipelayer's Backup Man, coating, grouting, making of joints, sealing,
caulking, diapering and including rubber gasket joints, pointing and any and all
other services
Rotary Scarifier or Multiple Head Concrete Chipping Scarifier
Steel Headerboard man and Guideline Setter
Trenching Machine, Hand Propelled

GROUP 4

Asphalt Raker, Luteman, Ironer, Asphalt Dumpman, and Asphalt Spreader Boxes (all
types)
Concrete Core Cutter, (walls, floors or ceilings) Grinder or Sander
Concrete Saw Man, Cutting Walls or Flat work, Scoring old or new concrete
Cribber, Shorer, Lagging, Sheeting and Trench Bracing, Hand-Guided Lagging
Hammer
Laser Beam in connection with Laborer's work
Oversize Concrete Vibrator Operator, 70 pounds and over
Pipelayer
Sandblaster (Nozzleman), Porta Shot-Blast, Water Blasting

GROUP 5

Blasters Powderman- All work of loading holes, placing and blasting of all
powder and explosive of whatever type, regardless of method used for
such loading and placing
Driller: All power drills, excluding Jackhammer, whether core, diamond,
wagon, track, multiple unit, and any and all other types of mechanical drills without
regard to the form of motive power
Toxic Waste Removal
Welding in connection with Laborer's work

SPECIALTY GROUP:

TUNNEL

GROUP 2

Bull Gang, Muckers, Trackmen
Chucktender, Cabletender
Concrete Crew (includes Rodders and Spreaders)
Dumpman
Grout Crew
Helper for Steel Form Raisers and Setters
Muckers - Tunnel (hand or machine)
Nipper
Swamper (Brakeman, Switchman on Tunnel work)
Vibratormen, Jackhammer, Pneumatic Tools (except driller), Multiplate
Impact Wrench

GROUP 3

Blasters, Driller, Powderman
Cherry Pickerman
Grout Gunman
Kemper and other Pneumatic Concrete Placer Operator mines in short dry tunnels
under streets, highways and similar places
Miners-Tunnels (hand or machine)
Powderman (tunnel work)
Steel Form Raisers and Setters
Timberman, Retimberman - wood or steel
Watchman

GROUP 4

Powderman - Primer House (licensed) on tunnel work Shaft and Raise Miner

GROUP 5

Blaster (licensed) all work of loading holes, placing and blasting all powder and
explosives of whatever type regardless of method used for such loading and
placing.
Shifters

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

**CRAFT: #LABORER
(CONSTRUCTION-FENCE ERECTOR-HOUSEMOVER)**

DETERMINATION: SD-23-102-3-2019-1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION ^a (Journey person)	Employer Payments						Straight-Time		Overtime Hourly Rate		
	Basic Hourly Rate	Health and Welfare	Pension	Vacation/ Holiday	Training	Other Payments	Hours	Total Hourly Rate	Daily ^b 1 1/2X	Saturday ^c 1 1/2X	Sunday/ Holiday 2X
Laborer: Engineering Construction											
Group 1	\$34.04	7.47	8.38	3.00	0.69	2.65	8	56.23	73.25	73.25	90.27
Group 2	34.50	7.47	8.38	3.00	0.69	2.65	8	56.69	73.94	73.94	91.19
Group 3	34.91	7.47	8.38	3.00	0.69	2.65	8	57.10	74.555	74.555	92.01
Group 4	35.75	7.47	8.38	3.00	0.69	2.65	8	57.94	75.815	75.815	93.69
Group 5	39.02	7.47	8.38	3.00	0.69	2.65	8	61.21	80.72	80.72	100.23

#Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet at <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' Website at <http://www.dir.ca.gov/das/das.html>.

^a For classifications within each group, see page 30A.

^b Rate applies to the first 4 daily overtime hours and for the first 12 overtime hours on Saturday; thereafter, all daily and Saturday overtime is paid at the Sunday/Holiday rate.

^c Saturdays in the same workweek may be worked at the straight-time rate for the first 8 hours, if the employee was unable to complete the 40 hours during the normal workweek due to inclement weather.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the Travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or Subsistence provisions for current or superseded determinations may be obtained by contacting the Office of the Director - Research Unit at (415) 703-4774.

FOR ENGINEERING CONSTRUCTION

GROUP 1

Asphalt-Rubber Material Loader
Boring Machine Helper
Certified Confined Space Laborer
Carpenter's Laborer
Concrete Screeder (for rough strike-off)
Concrete, Water Curing
Demolition Laborer
Fiberoptic Installation, Blowing, Splicing and Testing Technician on
Public Right of Ways only.
Fire Watcher
Flagman
Gas, Oil and Water Pipeline Laborer
House Mover
Laborer, General Clean-up
Laborer, General or Construction
Laborer, Jetting
Laborer Temporary Water and Air Lines
Material Hoseman (Slabs, walls and decks)
Plugging, Filling of Shee-Bolt Holes; Dry Packing of Concrete and
Patching
Post Hole Digger (Manual)
Railroad Laborer
Rigging and Signaling
Scaler
Slip-form Raisers
Tool Crib or Tool House Laborer
Traffic Control by any method
Water Well Driller Helper
Window Cleaner
Wire Mesh Puller (All concrete)

GROUP 2

Asphalt Headboard Man
Asphalt Shoveler
Cement Dumper (on 1 yard or larger mixers and handling bulk cement)
Cesspool Digger and Installer
Chucktender
Chute Man (handling chute for concrete pouring from mixer truck for
walls, slabs, decks, floors, foundations, curbs, etc.)
Concrete Curer
Cutting Torch Operator (Demolition)
Fine Grader (for streets, highways, airport runaways and similar
work)
Gas, Oil, and Water Pipeline Wrapper Pot Tender & Form Man
Guinea Chaser
Installation of all Asphalt Overlay Fabric and Materials used for
Reinforcing Asphalt
Laborer, Packing Rod Steel and Pans
Pittsburg Chipper (and similar type Brush Shredders)
Riprap Stone Paver
Roto Scraper & Tiller
Sandblast pot Tender
Septic Tank Digger and Installer (Leadsman)
Tank Scaler & Cleaner
Tar Man & Mortar Man
Tree Climber/Faller (chainsaw operator)
Underground Laborers (Including Caisson Bellow)
Vapor Barrier Installer (membrane)

GROUP 3

Asphalt Installation of all fabrics
Buggymobile Man
Compactor (all types including Tamper, Barko and Wacker)
Concrete Pile cutter
Driller/Jackhammer (with drill steel 2 ½ feet or longer)
Dry Pak-it Machine
Fence Erector
Gas, Oil and/or Water Pipeline Wrapper – 6” Pipe and over by any
method, inside and out
High Scaler (including drilling of same)
Impact Wrench Man (multi-plate)
Kettleman-Potman Hot Mop, includes applying Asphalt, lay-kold,
creosote, lime caustic and similar types of materials
Laser Beam (In connection with Laborer work)
Pipelayer Backup man (coating, grouting, making of joints, sealing,
caulking, diapering and including rubber gasket joints, pointing and
other services)
Power Machine Operators (Pneumatic, Gas, Electric tools-vibrating
machines, pavement breakers, air blasting, Come-Alongs and similar
machines not separately classified herein)
Power Post Hole Digger
Rock Slinger
Rotary Scarifier (multiple head concrete chipper Scarifier)
Steel Headerboard man (and Guideline Setter)
Trenching Machine (Hand propelled)

GROUP 4

Asphalt Raker & Luteman (Including Ironer, Dumpman and Spreader
Box)
Concrete Coring (Wall, floor and ceiling Cutter – Grinding Sander)
Concrete Saw Man (cutting walls or flat work, scoring old or new
concrete)
Cribber/Shorer (lagging, sheeting and bracing and hand guided lagging
hammer)
Head Rock Slinger
Laborer, Asphalt – Rubber Distributor Bootman
Oversize Concrete Vibrator Operator, 70 pounds and over
Pipe Layer
Prefabricated manhole (Installer)
Raw Sewage Exposure (any worker)
Sandblast Nozzle Man (water blasting – Porta Shot Blast)
Traffic Lane Closure, Certified

GROUP 5

Blaster Powderman
Driller: All power drills, excluding Jackhammer, whether core, diamond,
wagon, track, multiple unit, and any and all other types of mechanical
drills without regard to the form of motive power.
Toxic Waste Removal
Welding (in connection with Laborers work)

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #LANDSCAPE/IRRIGATION LABORER/TENDER

DETERMINATION: SD-102-X-14-2019-1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: July 31, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (JOURNEYPEPERSON)	Basic Hourly Holiday Rate	Employer Payments					Straight-Time		Overtime Hourly Rate		
		Health and Holiday Welfare	Pension	Vacation/ Holiday ^a	Training	Other	Hours	Total Hourly	Daily ^b	Saturday ^b	Sunday/
								Rate	1 1/2X	1 1/2X	2X

ENGINEERING CONSTRUCTION

Landscape/Irrigation Laborer	\$33.65	7.47	8.40	4.87	0.69	0.48	8	55.56	72.385	72.385	89.21
Landscape Hydro Seeder	34.81	7.47	8.40	4.87	0.69	0.48	8	56.72	74.125	74.125	91.53

DETERMINATION: SD-102-X-14-2019-1A

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: July 31, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

BUILDING CONSTRUCTION

Landscape/Irrigation Laborer	\$33.77	7.47	8.40	4.87	0.69	0.48	8	55.68	72.565	72.565	89.45
Landscape Hydro Seeder	35.77	7.47	8.40	4.87	0.69	0.48	8	57.68	75.565	75.565	93.45

DETERMINATION: SD-102-X-14-2019-1B

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: July 31, 2020* Effective until superseded by a new determination issued by the Director of Industrial Relations. Contact the Office of the Director – Research Unit at (415) 703-4774 for new rates after 10 days from the expiration date, if no subsequent determination is issued.

LOCALITY: All localities within San Diego County

Landscape/Irrigation Tender ^c	\$15.30	2.45	1.25	1.03 ^a	--	--	8	20.03	27.68	27.68	35.33
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#Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet at <http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 27, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' Website at <http://www.dir.ca.gov/das/das.html>.

^a Includes an amount per hour for Supplemental Dues.

^b Rate applies to the first 4 daily overtime hours and the first 12 hours on Saturday. All other time is paid at the Sunday and Holiday double-time rate.

^c The first employee on the jobsite shall be a Landscape/Irrigation Laborer; the second employee on the jobsite must be an Apprentice or a Landscape/Irrigation Laborer; and the third and fourth employees may be Tenders. The fifth employee on the jobsite shall be a Landscape/Irrigation Laborer; the sixth employee must be an Apprentice or a Landscape/Irrigation Laborer; and the seventh and eight employees may be Tenders. Thereafter, Tenders may be employed with Landscape/Irrigation Laborers in a 50/50 ratio on each jobsite. However, plant establishment may be performed exclusively by Landscape/Irrigation Tenders without the supervision of a Journeyman.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

TRAVEL AND/OR SUBSISTENCE PAYMENT: In accordance with Labor Code Sections 1773.1 and 1773.9, contractors shall make travel and/or subsistence payments to each worker to execute the work. You may obtain the Travel and/or subsistence provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Travel and/or Subsistence provisions for current or superseded determinations may be obtained by contacting the Office of the Director - Research Unit at (415) 703-4774.

GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1

FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: TUNNEL WORKER (LABORER-ENGINEERING CONSTRUCTION)

DETERMINATION: SD-23-102-5-2019-1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County.

Classification (Journey person)	Basic Hourly Rate	Employer Payments					Straight-Time		Overtime Hourly Rate		
		Health and Welfare	Pension	Vacation/ Holiday ^a	Training	Other Payments	Hours	Total Hourly Rate	Daily 1 1/2X ^b	Saturday 1 1/2X ^b	Sunday/ Holiday 2X
Group I	\$41.64	\$7.47	\$8.88	\$5.21	\$0.69	\$0.54	8	\$64.43	\$85.250	\$85.250	\$106.07
Group II	\$41.96	\$7.47	\$8.88	\$5.21	\$0.69	\$0.54	8	\$64.75	\$85.730	\$85.730	\$106.71
Group III	\$42.42	\$7.47	\$8.88	\$5.21	\$0.69	\$0.54	8	\$65.21	\$86.420	\$86.420	\$107.63
Group IV	\$43.11	\$7.47	\$8.88	\$5.21	\$0.69	\$0.54	8	\$65.90	\$87.455	\$87.455	\$109.01

^a Includes an amount per hour worked for supplemental dues.

^b All work performed over 12 hours in a single work day shall be paid for at double time (2X).

CLASSIFICATIONS

Group I

Bottom Lander
Changehouseman
Dumpman
Dumpman, Outside
Nipper
Pot Tender using mastic or other materials
Rollover Dumpman
Shotcrete Man (helper)
Subsurface Laborer (non-miner)
Swamper (Brakeman and Switchman on tunnel work)
Tool Man
Top Lander
Tunnel Materials Handling Man

Group II

Bull Gang Mucker
Trackman
Chemical Grout Jetman
Chucktender
Cabletender
Concrete crew-include Rodders and Spreaders
Grout Mixerman
Grout Pumpman
Operating of Trowling and/or Grouting Machines
Vibratorman
Jack Hammer Pneumatic Tools (except driller)

Group III

Blaster
Driller
Powderman
Cherry Pickerman
Grout Gunman
Jackleg Miner
Jumbo Man
Kemper and other Pneumatic Concrete Placer Operator
Miner - Tunnel (hand or machine)
Micro-Tunneling, Micro-Tunneling Systems
Nozzleman
Powderman-Primer House
Primer Man
Sandblaster
Segment Erector
Steel Form Raiser and Setter
Timberman, Retimberman, wood or steel

Group IV

Shaft and Raise Work
Diamond Driller

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

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GENERAL PREVAILING WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS
PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773 AND 1773.1
FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: #CEMENT MASON

DETERMINATION: SD-23-203-3-2019-2

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (Journey person)	Employer Payments						Straight-Time		Overtime Hourly Rate		
	Basic Hourly Rate	Health and Welfare	Pension	Vacation/ Holiday	Training	Other Payments	Hours	Total Hourly Rate	Daily ^b 1 1/2X	Saturday ^c 1 1/2X	Sunday/ Holiday 2X
Cement Mason Engineering Construction	\$32.37	8.17	13.65	3.50	0.60	^a 1.96	8	60.25	76.435	76.435	92.62

DETERMINATION: SD-23-203-3-2019-1A

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: June 30, 2020** The rate to be paid for work performed after this date has been determined. If work will extend past this date, the new rate must be paid and should be incorporated in contracts entered into now. Contact the Office of the Director – Research Unit for specific rates at (415) 703-4774.

LOCALITY: All localities within San Diego County

CLASSIFICATION (Journey person)	Employer Payments						Straight-Time		Overtime Hourly Rate		
	Basic Hourly Rate	Health and Welfare	Pension	Vacation/ Holiday	Training	Other Payments	Hours	Total Hourly Rate	Daily 1 1/2X	Saturday ^c 1 1/2X	Sunday/ Holiday 2X
Cement Mason Building Construction: TYPE I & II ^d	30.19	8.17	13.65	3.50	0.60	^a 1.96	8	58.07	73.165	73.165	88.26

Indicates an apprenticeable craft. The current apprentice wage rates are available on the Internet @

<http://www.dir.ca.gov/OPRL/PWAppWage/PWAppWageStart.asp>. To obtain any apprentice wage rates as of July 1, 2008 and prior to September 1, 2012, please contact the Division of Apprenticeship Standards or refer to the Division of Apprenticeship Standards' website at <http://www.dir.ca.gov/das/das.html>.

^a Includes amounts for Supplemental Dues and San Diego Construction Advancement Fund.

^b Rate applies to the first 4 daily overtime hours worked; all other overtime will be paid the Sunday and Holiday double time rate.

^c Saturdays in the same workweek may be worked at the straight-time rate for the first 8 hours, if the employee was unable to complete the 40 hours during the normal workweek.

^d Troweling Machine Man shall receive an additional \$0.25 per hour.

NOTE: For a description of engineering and/or building construction, contact the Office of the Director – Research Unit.

RECOGNIZED HOLIDAYS: Holidays upon which the general prevailing hourly wage rate for Holiday work shall be paid, shall be all holidays in the collective bargaining agreement, applicable to the particular craft, classification, or type of worker employed on the project, which is on file with the Director of Industrial Relations. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code. You may obtain the holiday provisions for the current determinations on the Internet at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Holiday provisions for current or superseded determinations may be obtained by contacting the Office of the Director – Research Unit at (415) 703-4774.

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FOR COMMERCIAL BUILDING, HIGHWAY, HEAVY CONSTRUCTION AND DREDGING PROJECTS

CRAFT: TEAMSTER
(APPLIES ONLY TO WORK ON THE CONSTRUCTION SITE)

DETERMINATION: SD-23-261-3-2019-1

ISSUE DATE: August 22, 2019

EXPIRATION DATE OF DETERMINATION: January 31, 2020*. Effective until superseded by a new determination issued by the Director of Industrial Relations. Contact the Office of the Director – Research Unit at (415) 703-4774 for the new rates after ten days after the expiration date if no subsequent determination is issued.

LOCALITY: All localities within San Diego County

Classification (Journey person)	Employer Payments						Straight-Time		Overtime Hourly Rates		
	Basic Hourly Rate	Health and Welfare	Pension	Vacation/ Holiday	Training	Other Payments	Hours ^a	Total Hourly Rate	Daily ^b 1 1/2X	Saturday ^b 1 1/2X	Sunday and Holiday 2X
Group 1	\$18.90	\$9.32	\$25.37	\$.00	-	\$.00	8	\$53.59	\$63.040	\$63.040	\$72.490
Group 2	26.49	9.32	25.37	.00	-	.00	8	61.18	74.425	74.425	87.670
Group 3	26.69	9.32	25.37	.00	-	.00	8	61.38	74.725	74.725	88.070
Group 4	26.89	9.32	25.37	.00	-	.00	8	61.58	75.025	75.025	88.470
Group 5	27.09	9.32	25.37	.00	-	.00	8	61.78	75.325	75.325	88.870
Group 6	27.59	9.32	25.37	.00	-	.00	8	62.28	76.075	76.075	89.870
Group 7	29.09	9.32	25.37	.00	-	.00	8	63.78	78.325	78.325	92.870

^a Saturday in the same workweek may be worked at the straight-time rate for the first 8 hours, if the employee was unable to complete the 40 hours during the normal work week due to inclement weather; power/blackout problems; major breakdown or suspension of project or portion thereof, which is beyond the employer's control.

^b Rate applies to the first 4 daily overtime hours and first 12 hours worked on Saturday. All other time is paid the Sunday and Holiday rate.

Group 1

Mechanic Trainee and delivery by pickup trucks
Swampers, Helpers, Fuelman (Fueler without trucks)

Group 2

2 Axle Dump Truck
2 Axle Flat Bed
Bunkerman
Concrete Pumping Truck
Forklift under 15,000 lbs
Industrial Lift Truck
Motorized Traffic Control
Pickup truck on jobsite
Truck Repairman Helper
Warehouse Clerk
Warehouseman
Welder Helper

Group 3

2 Axle Water Truck
3 Axle Dump Truck
3 Axle Flat Bed
Bootman
Cement Distributor, or Slurry Driver
Dump crete Truck less than 6 ½ yds
Erosion Control Nozzleman
Forklift 15,000 lbs and over
Pipeline Work Truck Driver
Prell Truck
Ross Carrier

Group 4

3 Axle Water Truck
4 Axle but less than 7 axles
Dump crete 6 1/2 yds and over
Dumpster Trucks
DW 10's, 20's and over
Erosion Control Driver
Fuel Truck and Dynamite
Grout Mixer Truck
Low-Bed Truck and Trailer
Off-road Dump Truck under 35 tons, Mfg rated capacity
Transit Mix Trucks under 8 yds
Truck Greaser
Truck Mounted Mobile Sweeper
Winch Truck 2 Axles

Group 5

7 Axles or more
A-Frame Trucks or Swedish Crane
Off-Road Dump Trucks 35 tons and over Mfg rated capacity
Road Oil Spreader
Tireman
Transit Mix Trucks 8 yds and over
Welders
Winch Truck 3 Axles or more

Group 6

Off Road Special Equipment (including but not limited to Water Pull Tankers, Athey Wagons, DJB, B70 Euclids or like equipment)

Group 7

Repairman

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PART V
TECHNICAL SPECIFICATIONS

PART V - TECHNICAL SPECIFICATIONS

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SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Work covered by the Contract Documents.
 - 2. Type of the Contract.
 - 3. Owner-furnished products.
 - 4. Use of premises.
 - 5. Owner's occupancy requirements.
 - 6. Work restrictions.
 - 7. Specification formats and conventions.
- B. Related Sections include the following:
 - 1. Section 01 22 00 Unit Prices for Line Items in Bid Schedule
 - 2. Section 01 23 00 Alternates for Additive Alternates

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Lakeside Equestrian Facility
 - 1. Project Location: 11055 Moreno Ave., Lakeside, CA 92040
- B. Owner: Department of Parks and Recreation, County of San Diego, 5500 Overland Ave., Suite 410, San Diego, California 92123
 - 1. Owner's Representative: Ieszie Formeller, Park Project Manager
- C. Civil Plan Set: Kleinfelder
- D. Architecture Plan Set: Warren Scott Architecture
- D. Construction Inspector/Resident Engineer:
 - 1. Owner will provide a County construction inspector and resident engineer for the project.

E. The Work consists of the following:

The Work includes removal of existing fencing, abandoned utilities and appurtenances as required. Site grading, drainage, erosion control, and installation of storm water Best Management Practices. Installation of an all-way stop intersection, site work improvements, fencing, hardscape, and utilities including coordination with associated utility companies. Installation of an equestrian arena with covered roof structure and associated improvements.

Additive Alternate 1: Installation of a meeting room/kitchen building, restroom building, dumpster area, announcer's booth, and related site improvements and utilities.

Additive Alternate 2: Installation of a storage/shop building, host pad with shade structure, overnight recreational vehicle parking spaces with utility hook-ups, associated site improvements, associated utilities, associated site work and equipment.

Additive Alternate 3: Installation of decorative fencing, signage, planting, irrigation, associated utilities, and associated site work and equipment.

Additive Alternate 4: Installation of an equestrian arena and associated improvements, livestock corrals and associated equipment, and associated site work and utilities.

NOTE TO CONTRACTOR: See additional clarification on scope of base bid and additive alternates in the project specifications and construction drawings.

1.4 TYPE OF CONTRACT

A. Project will be constructed under a single prime contract.

1.5 OWNER-FURNISHED PRODUCTS

A. Owner will furnish products indicated. The Work includes providing support systems to receive Owner's equipment. The work includes assembly and installation of the products.

1. Owner will arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule.
2. After delivery, Contractor will inspect delivered items for damage. Owner shall be present for and assist in Contractor's inspection.
3. If Owner-furnished items are damaged, defective, or missing, Owner will arrange for replacement.
4. Contractor will arrange for manufacturer's field services and for delivery of manufacturer's warranties to Owner.
5. Owner will furnish Contractor the earliest possible delivery date for Owner-furnished products. Using Owner-furnished earliest possible delivery dates, Contractor shall designate delivery dates of Owner-furnished items in Contractor's Construction Schedule.
6. Contractor shall review Shop Drawings, Product Data, and Samples and return them to Project Manager/Engineer noting discrepancies or anticipated problems in use of product.
7. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site, if any.

8. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
9. If Owner-furnished items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.
10. Contractor shall install and otherwise incorporate Owner-furnished items into the Work.

B. Owner-Furnished Products:

1. AutoCAD site plan in electronic format for development of project record documents as defined in Section 01 78 10 and for surveying as defined in Section 02 21 00.

1.6 USE OF SITE

- A. Use of Site: Limit use of site to areas within the Contract limits. Do not disturb portions of Project site beyond areas in which the Work is indicated, e.g. limit of work line, see plans.

1. Owner Occupancy: Upon construction completion.
2. Roads, Driveways and Entrances: Keep roads, driveways, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of roads, driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.7 WORK RESTRICTIONS

- A. On-Site Work Hours: Work shall be generally performed during normal business working hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, except otherwise indicated.
1. Weekend Hours: As approved by Project Manager/Engineer.
 2. Early Morning Hours: As approved by Project Manager/Engineer.

1.8 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 48-division format and CSI/CSC's 2016 edition of the "MasterFormat" numbering system.
1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
 2. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.9 CONSTRUCTION DOCUMENTS

- A. It is the intent of the Construction Documents that all materials, products and systems be used in the manner intended by the manufacturer. In the absence of instructions to the contrary, where readily identifiable, the manufacturer's or his trade association's specifications and/or directions are hereby incorporated by reference.
- B. The intent of the Construction Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all. Performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results.
 1. "Reasonably inferable" is defined as a degree of interpretation of the documents which will provide, at the Contractor's expense, complete working systems within the parameters of the following examples:
 - a. Where light fixtures or equipment are indicated, it is reasonably inferable that power and circuiting be provided.
 - b. Where plumbing fixtures are indicated, it is reasonably inferable that waste be provided.
 - c. Where items of work are indicated which are not prefinished, it is reasonable inferable that shop or field finish is required. Finish shall be to the standard of quality specified for similar materials.
 2. In providing complete working systems, in the absence of complete information, the Contractor shall be required to provide components to a standard of quality consistent with similar work specified. In the absence of such standard, he shall be entitled to provide such items at the least cost to him consistent with industry standards, as approved by the Project Manager/Engineer and Architect.

1.10 CONTRACT UNIT PRICES

- A. The contract unit prices paid for work shall include full compensation for furnishing all labor, materials, tools, equipment, delivery and incidentals as identified on the drawings and in these technical specifications, complete, in-place and doing all the work involved and providing any specialty tools as required, and no additional compensation will be allowed therefore.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 22 00

UNIT PRICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. List of unit prices, for use in preparing change orders.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

1.2 RELATED SECTIONS

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification Sections apply to work of this section.
- B. Section 01 23 00 – Additive Alternates

1.3 COSTS INCLUDED

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit. Unit Prices quoted will be used to adjust the Contract Price either up or down should this work be added to or deleted from the scope of work.

1.4 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount. Contractor is responsible for actual quantities based on the plans.

1.5 PAYMENT

- A. Payment for Work governed by unit prices will be made on the basis of the verified measurements and quantities of Work which is incorporated in or made necessary by the Work and accepted by the Resident Engineer, multiplied by the unit sum/price.
- B. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from the transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Product quantities where there has been no record or measurement kept and for which there is no verification by the Resident Engineer.

1.6 DEFECT ASSESSMENT

- A. Replace Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of Resident Engineer, it is not practical to remove and replace the Work, the Resident Engineer will direct one of the following remedies:
 - 1. The defective Work may remain, but the unit sum/price will be adjusted to a new sum/price at the discretion of Resident Engineer.

2. The defective Work will be partially repaired to the instructions of the Resident Engineer, and the unit sum/price will be adjusted to a new sum/price at the discretion of Resident Engineer.
- C. The authority of the Resident Engineer to assess the defect and identify payment adjustment is final.

1.8 SCHEDULE OF UNIT PRICES

- A. Refer to Bid Schedule for unit prices under Part II, Documents to be executed by bidder.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 23 00
ADDITIVE ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for additive alternates.

1.3 DEFINITIONS

- A. Additive Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost and/or credit for each additive alternate is the net addition to the Contract Sum to incorporate the additive alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project. Costs listed for each alternate shall include costs of related coordination, modification, or adjustment.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

- E. Payment: The contract unit prices paid for work shall include full compensation for furnishing all labor, materials, tools, equipment, delivery and incidentals as identified on the drawings and in these technical specifications, complete, in-place and doing all the work involved and providing any specialty tools as required, and no additional compensation will be allowed therefore.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Additive Alternate 1: Installation of a meeting room/kitchen building, restroom building, dumpster area, announcer's booth, and related site improvements and utilities, as specified in plans and specifications.
- B. Additive Alternate 2: Installation of a storage/shop building, host pad with shade structure, overnight recreational vehicle parking spaces with utility hook-ups, associated site improvements, associated utilities, associated site work and equipment, as specified in plans and specifications.
- C. Additive Alternate 3: Installation of decorative fencing, signage, planting, irrigation, associated utilities, and associated site work and equipment, as specified in plans and specifications.
- D. Additive Alternate 4: Installation of an equestrian arena and associated improvements, livestock corrals and associated equipment, and associated site work and utilities, as specified in plans and specifications.

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination Drawings.
 - 2. Administrative and supervisory personnel.
 - 3. Project meetings.
 - 4. Requests for Interpretation (RFIs).
- B. Related Sections include the following:
 - 1. Division 1 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
 - 2. Division 1 Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Division 1 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.4 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.
 4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner if coordination of Owner's Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's Construction Schedule.
 2. Preparation of the Schedule of Values (based on Bid Schedule in Part II-Documents to be Executed by Bidder)
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Pre-installation meetings
 6. Progress meetings.
 7. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. To greatest extent possible, salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
 - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - b. Indicate required installation sequences.
 - c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Project Manager/Engineer for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

2. Sheet Size: At least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
 3. Number of Copies: Submit one electronic copy of each submittal. Project Manager/Engineer will return an electronic copy.
 - a. Submit one electronic copy where Coordination Drawings are required for operation and maintenance manuals. Project Manager/Engineer will return an electronic copy.
 4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.
- B. Key Personnel Names: Within seven working days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.6 PROJECT MEETINGS

- A. General: Owner will schedule and conduct meetings and conferences at Project site or County Operations Center, unless otherwise indicated.
1. Attendees: Project Manager/Engineer or County Inspector will inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Project Manager/Engineer or County Inspector of other scheduled meeting dates and times.
 2. Agenda: Project Manager/Engineer or County Inspector will prepare the meeting agenda, and distribute the agenda to all invited attendees.
 3. Minutes: Project Manager/Engineer or County Inspector will record significant discussions and agreements achieved, and distribute the meeting minutes to everyone concerned, including Architect, within three days of the meeting.
- B. Preconstruction Conference: Owner will schedule a preconstruction conference before starting construction, at a time convenient to Contractor and Project Manager/Engineer or County Inspector, but no later than seven working days after execution of the Agreement. The conference will be held at Project site or another convenient location as designated by Project Manager/Engineer or County Inspector. Project Manager/Engineer or County Inspector will conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Project Manager/Engineer or County Inspector, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:

- a. Tentative construction schedule.
- b. Critical work sequencing and long-lead items.
- c. Designation of key personnel and their duties.
- d. Procedures for processing field decisions and Change Orders.
- e. Procedures for RFIs.
- f. Procedures for testing and inspecting.
- g. Procedures for processing Applications for Payment.
- h. Distribution of the Contract Documents.
- i. Submittal procedures.
- j. Preparation of Record Documents.
- k. Work restrictions.
- l. Responsibility for temporary facilities and controls.
- m. Construction waste management and recycling.
- n. Parking availability.
- o. Office, work, and storage areas.
- p. Equipment deliveries and priorities.
- q. First aid.
- r. Security.
- s. Progress cleaning.
- t. Working hours.

3. Minutes: Project Manager/Engineer or County Inspector will record and distribute meeting minutes.

C. Pre-installation Meeting: Conduct a pre-installation meeting at Project site before each construction activity that requires coordination with other construction. Such as water and electrical power connections.

- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Project Manager/Engineer or County Inspector of other scheduled meeting dates.
- 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. The Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written recommendations.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.

- q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Project Manager/Engineer or County Inspector will conduct progress meetings at regular intervals, and coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Project Manager/Engineer, or County Inspector each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.

- 11) Progress cleaning.
- 12) Quality and work standards.
- 13) Status of correction of deficient items.
- 14) Field observations.
- 15) RFIs.
- 16) Status of proposal requests.
- 17) Pending changes.
- 18) Status of Change Orders.
- 19) Pending claims and disputes.
- 20) Documentation of information for payment requests.

3. Minutes: Project Manager/Engineer or County Inspector will record the meeting minutes.
4. Reporting: Project Manager/Engineer will distribute minutes of the meeting to each party present and to parties who should have been present.

a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Provide revised schedule to Project Manager/Engineer or County Inspector for issuance concurrently with the report of each meeting.

1.7 REQUESTS FOR INTERPRETATION (RFIs)

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

- B. Costs incurred by Owner for Consultants' reviewing and responding to unnecessary or frivolous RFIs shall be the responsibility of the Contractor.

- C. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:

1. Project name.
2. Date.
3. Name of Contractor.
4. Name of Project Manager/Engineer, County Inspector and Architect.
5. RFI number, numbered sequentially.
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
10. Contractor's signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

- a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

D. Electronic RFIs: Form as approved by Project Manager/Engineer and County Inspector.

1. Identify each page of attachments with the RFI number and sequential page number.

E. Project Manager/Engineer Action: Project Manager/Engineer or County Inspector and his Consultants will review each RFI, determine action required, and return it. Allow ten working days for Project Manager/Engineer's or County Inspector's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:

- a. Requests for approval of submittals.
- b. Requests for approval of substitutions.
- c. Requests for coordination information already indicated in the Contract Documents.
- d. Requests for adjustments in the Contract Time or the Contract Sum.
- e. Requests for interpretation of Project Manager/Engineer's, County Inspector's and his Consultants' actions on submittals.
- f. Incomplete RFIs or RFIs with numerous errors.

2. Project Manager/Engineer's action may include a request for additional information, in which case Project Manager/Engineer's time for response will start again.

3. Project Manager/Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposals.

- a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Project Manager/Engineer in writing within 10 days of receipt of the RFI response.

F. On receipt of Project Manager/Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Project Manager/Engineer within seven days if Contractor disagrees with response.

G. RFI Log: Prepare, maintain, and submit electronically a tabular log of RFIs organized by the RFI number. Update and submit log to Project Manager within one-week after occurrence of new RFI's. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Names and addresses of Project Manager/Engineer, and County Inspector, if present.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Project Manager/Engineer response was received.
8. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Schedule of Values based on Bid Schedule
 - 3. Submittals Schedule.
 - 4. Weekly construction reports.
 - 5. Material delivery reports
 - 6. Water Pollution Control Plan (WPCP) reports
- B. Related Sections include the following:
 - 1. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
 - 2. Division 1 Section "Submittal Procedures" for submitting schedules and reports.
 - 3. Division 1 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Project Manager/Engineer.
- C. Event: The starting or ending point of an activity.
- D. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

E. Milestone: A key or critical point in time for reference or measurement.

F. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

A. Submittals Schedule: Submit one electronic copy of schedule to the Project Manager. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Project Manager/Engineer's final release or approval.

B. Contractor's Construction Schedule: Submit one electronic copy of initial schedules showing entire schedule for entire construction period.

C. Payment Schedule: Concurrent with Bid schedule/Schedule of Values, submit one electronic copy of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading/man-hours, original duration, remaining duration.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.

D. Daily Construction Reports: Submit one electronic copy at weekly intervals.

E. Material Location Reports: Submit one electronic copy at monthly intervals.

F. Field Condition Reports: Submit one electronic copy at time of discovery of differing conditions.

1.5 QUALITY ASSURANCE

A. Pre-construction Meeting: Conduct meeting at Project site or alternate location per the Project Manager to comply with requirements in Division 1 Section "Project Management and

Coordination." Review methods and procedures related to the Contractor's Construction Schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including interim milestones.
4. Review time required for review of submittals and resubmittals.
5. Review requirements for tests and inspections by independent testing and inspecting agencies.
6. Review time required for completion and startup procedures.
7. Review and finalize list of construction activities to be included in schedule.
8. Review submittal requirements and procedures.
9. Review procedures for updating schedule.
10. Review communication protocols.

1.6 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 1. Secure time commitments for performing critical elements of the Work from parties involved.
 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 - a. At Contractor's option, show submittals on the Construction Schedule, instead of tabulating them separately.
 2. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.
 3. Contractor shall provide a submittal schedule to Project Manager no later than seven working days after the Notice to Proceed and prior to first invoice.

2.2 SCHEDULE OF VALUES (Based on Bid Schedule)

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with Continuation Sheets.
 - b. Contractor's Construction Schedule.
2. Submit the Schedule of Values to Project Manager/Engineer at earliest possible date but no later than seven working days after the Notice to Proceed.

B. Format and Content: Use the Bid Schedule in Part II as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of Project Manager/Engineer..
 - c. Contractor's name and address.
 - d. Date of submittal.
2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value.
3. Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents and/or Bid Schedule. Provide several line items for principal subcontract amounts, where appropriate.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Allowances: Provide a separate line item in the Schedule of Values for each allowance, if used.
8. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

- a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
- 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Project Manager/Engineer.
 - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 - 4. Startup and Testing Time: Include not less than 14 days for startup and testing.
 - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Project Manager/Engineer's administrative procedures necessary for certification of Substantial Completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
- 1. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 - 2. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Use of premises restrictions.
 - d. Seasonal variations.
 - e. Environmental control.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

- F. Contractor shall provide the Construction Schedule to the Project Manager within seven working days of the Notice to Proceed for approval by the Project Manager and prior to the first invoice. No payment shall be made without an approved schedule.

2.4 REPORTS

- A. Weekly Construction Reports: Prepare a weekly construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. Approximate count of personnel at Project site.
 3. Equipment at Project site.
 4. Material deliveries.
 5. High and low temperatures and general weather conditions.
 6. Accidents.
 7. Meetings and significant decisions.
 8. Unusual events (special reports).
 9. Stoppages, delays, shortages, and losses.
 10. Emergency procedures.
 11. Construction activities.
 12. Orders and requests of authorities having jurisdiction.
 13. Change Orders received and implemented.
 14. Construction Change Directives received and implemented.
 15. Services connected and disconnected.
 16. Equipment or system tests and startups.
 17. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule at each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution: Distribute electronic copies of approved schedule to Project Manager/Engineer, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices, if available.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections include the following:
 - 1. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
 - 2. Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
 - 3. Division 1 Section "Quality Requirements" for submitting test and inspection reports and for mockup requirements.
 - 4. Division 1 Section "Closeout Procedures" for submitting warranties.
 - 5. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 6. Division 1 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 7. Divisions 2 through 49 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Project Manager/Engineer's responsive action.
- B. Informational Submittals: Written information that does not require Project Manager/Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by the County for Contractor's use in preparing submittals, except the County will provide electronic CAD files consisting of the construction/layout plans and base plan to the Contractor for aiding in the development of project record documents, see Section 01 78 10, and site surveying by the Contractor, see Section 02 21 00.

- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Project Manager/Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Project Manager/Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Project Manager/Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 10 days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Project Manager/Engineer's consultants, Owner, or other parties is indicated, allow 15 days for initial review of each submittal.
- E. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Project Manager/Engineer.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Project Manager/Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
- 1) Submittal number shall use Specification Section number with submittal number revisions noted with '.Rev'.

- i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
- F. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- G. Additional Copies: Unless additional copies are required for final submittal, and unless Project Manager/Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 - 1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Project Manager/Engineer.
 - 2. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.
- H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Project Manager/Engineer will return submittals, without review, received from sources other than Contractor.
 - 1. Transmittal Form: Provide locations on form for the following information:
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.
 - h. Specification Section number and title.
 - i. Drawing number and detail references, as appropriate.
 - j. Transmittal number.
 - k. Submittal and transmittal distribution record.
 - l. Remarks.
 - m. Signature of transmitter.
 - 2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Project Manager/Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.
 - 3. Only complete submittals will be reviewed by the Project Manager/Engineer. The Contractor shall not submit partial or incomplete submittals unless otherwise indicated by the Project Manager/Engineer. Costs associated with Project Manager/Engineer time spent reviewing incomplete or partial submittals, without prior approval of the Project Manager/Engineer, will be paid to the Owner by the Contractor at the rate determined by the Owner.
- I. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked "No Exception Taken," or "Make Corrections Noted."

J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

K. Use for Construction: Use only final submittals with mark indicating "No Exception Taken," or "Make Corrections Noted."

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

- a. Manufacturer's written recommendations.
- b. Manufacturer's product specifications.
- c. Manufacturer's installation instructions.
- d. Standard color charts.
- e. Manufacturer's catalog cuts.
- f. Wiring diagrams showing factory-installed wiring.
- g. Printed performance curves.
- h. Operational range diagrams.
- i. Mill reports.
- j. Standard product operation and maintenance manuals.
- k. Compliance with specified referenced standards.
- l. Testing by recognized testing agency.
- m. Application of testing agency labels and seals.
- n. Notation of coordination requirements.

4. Submit Product Data before or concurrent with Samples.

5. Number of Copies: Submit one electronic copy of Product Data, unless otherwise indicated. Project Manager/Engineer, will return one electronic copy. Mark up and retain one returned copy as a Project Record Document.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - m. Relationship to adjoining construction clearly indicated.
 - n. Seal and signature of professional engineer if specified.
 - o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
 3. Number of Copies: Submit one electronic copy of each submittal. Project Manager/Engineer will return one electronic copy. Mark up and retain one returned copy as a Project Record Drawing.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of appropriate Specification Section.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

- a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Project Manager/Engineer will return submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Project Manager/Engineer will retain two Sample sets; remainder will be returned to be kept on-site.

- 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
- 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

- 1. Type of product. Include unique identifier for each product.
- 2. Number and name site area, room or space.
- 3. Location within site area, room or space.
- 4. Number of Copies: Submit one electronic copy of product schedule or list, unless otherwise indicated. Project Manager/Engineer will return one electronic copy.

- a. Mark up and retain one returned copy as a Project Record Document.

F. Submittals Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

G. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

- 1. Name, address, and telephone number of entity performing subcontract or supplying products.
- 2. Number and title of related Specification Section(s) covered by subcontract.
- 3. Drawing number and detail references, as appropriate, covered by subcontract.
- 4. Number of Copies: Submit three copies of subcontractor list, unless otherwise indicated. Project Manager/Engineer will return two copies.

- a. Mark up and retain one returned copy as a Project Record Document.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
1. Number of Copies: Submit one electronic copy of each submittal, unless otherwise indicated. Project Manager/Engineer will not return copies.
 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 3. Test and Inspection Reports: Comply with requirements specified in Division 1 Section "Quality Requirements."
- B. Coordination Drawings: Comply with requirements specified in Division 1 Section "Project Management and Coordination."
- C. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."
- D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- J. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- L. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

- M. Schedule of Tests and Inspections: Comply with requirements specified in Division 1 Section "Quality Requirements."
- N. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- O. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- P. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- Q. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 1 Section "Operation and Maintenance Data."
- R. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- S. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
1. Preparation of substrates.
 2. Required substrate tolerances.
 3. Sequence of installation or erection.
 4. Required installation tolerances.
 5. Required adjustments.
 6. Recommendations for cleaning and protection.
- T. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

U. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

V. Material Safety Data Sheets (MSDSs): Submit information directly to Project Manager/Engineer as part of the submittal package, except as required in "Action Submittals" Article.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for completeness and coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Project Manager/Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 PROJECT MANAGER/ENGINEER ACTION

- A. General: Project Manager/Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action. Project Manager/Engineer will not review incomplete or partial submittals unless otherwise approved in advance by Project Manager/Engineer.
- B. Action Submittals: Project Manager/Engineer or his/her Consultants will review each submittal, make marks to indicate corrections or modifications required, and return it. Project Manager/Engineer or his/her Consultants will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 1. No Exceptions Taken
 2. Make Corrections Noted
 3. Revise and Resubmit
 4. Rejected

- C. Informational Submittals: Project Manager/Engineer or his/her Consultants will review each submittal and will not return it, or will return it if it does not comply with requirements. Project Manager/Engineer will forward each submittal to appropriate party.
- D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Project Manager/Engineer, Architect, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
 - 1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
 - 2. Division 1 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
 - 3. Divisions 2 through 49 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed

construction comply with requirements. Services do not include contract enforcement activities performed by Project Manager/Engineer, or Architect.

- C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.
- D. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- J. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Project Manager/Engineer for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply

with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Project Manager/Engineer for a decision before proceeding.

1.5 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Testing Agency Qualifications: An NRTL, an NVLAP, County of San Diego provided agency, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.

2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

G. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

H. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

a. Provide test specimens representative of proposed products and construction.

b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.

c. Provide sizes and configurations of test assemblies, and mockups to adequately demonstrate capability of products to comply with performance requirements.

d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.

e. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project, without approval of Project Manager/Engineer.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Project Manager/Engineer, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Project Manager/Engineer.

2. Notify Project Manager/Engineer seven days in advance of dates and times when mockups will be constructed.

3. Demonstrate the proposed range of aesthetic effects and workmanship.

4. Obtain Project Manager/Engineer's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated, or approved by Project Manager/Engineer.

1.7 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency or personnel to perform these services.
 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies or personnel engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- E. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.8 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Contractor will engage a qualified third-party testing agency or special inspector to conduct special tests and inspections as required and as follows:
1. Notifying Project Manager/Engineer, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 2. Submitting a certified written report of each test, inspection, and similar quality-control service to Project Manager/Engineer, with copy to Contractor and to authorities having jurisdiction.
 3. Submitting a final report of special tests and inspections at Substantial Completion which includes a list of unresolved deficiencies.
 4. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 5. Special tests and inspections as required to meet all relevant laws, codes, regulations, standards and best practices as related to the scope of work.
 6. Retesting and reinspecting corrected work.
- B. Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Project Manager/Engineer.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Project Manager/Engineer's reference during normal working hours.

END OF SECTION

SECTION 01 42 00

REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Standard Specifications, Additions and Modifications of the Standard Specifications, and County of San Diego Special Provisions.
- B. "Approved": When used to convey Project Manager/Engineer or Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Project Manager/Engineer or Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.
- D. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA)	(800) 872-2253
	Architectural Barriers Act (ABA)	
	Accessibility Guidelines for Buildings and Facilities	(202) 272-0080
	Available from Access Board www.access-board.gov	
CFR	Code of Federal Regulations	(888) 293-6498
	Available from Government Printing Office	(202) 512-1530
	www.gpoaccess.gov/cfr/index.html	
CRD	Handbook for Concrete and Cement	(601) 634-2355
	Available from Army Corps of Engineers	
	Waterways Experiment Station	
	www.wes.army.mil	
DOD	Department of Defense Military Specifications and Standards	(215) 697-6257
	Available from Department of Defense Single Stock Point	
	www.dodssp.daps.mil	
DSCC	Defense Supply Center Columbus (See FS)	
FED-STD	Federal Standard (See FS)	
FS	Federal Specification	(215) 697-6257
	Available from Department of Defense Single Stock Point	
	www.dodssp.daps.mil	
	Available from General Services Administration	(202) 501-1021
	www.fss.gsa.gov	
	Available from National Institute of Building Sciences	(202) 289-7800
	www.nibs.org	
FTMS	Federal Test Method Standard	

(See FS)

ICC-ES	ICC Evaluation Service, Inc. www.icc-es.org	(800) 423-6587 (562) 699-0543
MIL	(See MILSPEC)	
MIL-STD	(See MILSPEC)	
MILSPEC	Military Specification and Standards Available from Department of Defense Single Stock Point www.dodssp.daps.mil	(215) 697-6257
NES	(Formerly: National Evaluation Service) (See ICC-ES)	
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The) www.aluminum.org	(202) 862-5100
AAADM	American Association of Automatic Door Manufacturers www.aaadm.com	(216) 241-7333
AABC	Associated Air Balance Council www.aabchq.com	(202) 737-0202
AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
AASHTO	American Association of State Highway and Transportation Officials www.transportation.org	(202) 624-5800
AATCC	American Association of Textile Chemists and Colorists (The) www.aatcc.org	(919) 549-8141
ABMA	American Bearing Manufacturers Association www.abma-dc.org	(202) 367-1155
ACI	ACI International (American Concrete Institute) www.aci-int.org	(248) 848-3700

ACPA	American Concrete Pipe Association www.concrete-pipe.org	(972) 506-7216
AEIC	Association of Edison Illuminating Companies, Inc. (The) www.aeic.org	(205) 257-2530
AF&PA	American Forest & Paper Association www.afandpa.org	(800) 878-8878 (202) 463-2700
AGA	American Gas Association www.aga.org	(202) 824-7000
AGC	Associated General Contractors of America (The) www.agc.org	(703) 548-3118
AHA	American Hardboard Association (Now part of CPA)	
AHAM	Association of Home Appliance Manufacturers www.aham.org	(202) 872-5955
AI	Asphalt Institute www.asphaltinstitute.org	(859) 288-4960
AIA	American Institute of Architects (The) www.aia.org	(800) 242-3837 (202) 626-7300
AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction www.aitc-glulam.org	(303) 792-9559
ALCA	Associated Landscape Contractors of America www.alca.org	(800) 395-2522 (703) 736-9666
ALSC	American Lumber Standard Committee, Incorporated www.alsc.org	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
AOSA	Association of Official Seed Analysts www.aosaseed.com	(505) 522-1437
APA	APA - The Engineered Wood Association www.apawood.org	(253) 565-6600
APA	Architectural Precast Association www.archprecast.org	(239) 454-6989

API	American Petroleum Institute www.api.org	(202) 682-8000
ARI	Air-Conditioning & Refrigeration Institute www.ari.org	(703) 524-8800
ARMA	Asphalt Roofing Manufacturers Association www.asphaltroofing.org	(202) 207-0917
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASLA	American Society of Landscape Architects www.asla.org	(888) 999-2752 (202) 898-2444
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763 (212) 591-7722
ASSE	American Society of Sanitary Engineering www.asse-plumbing.org	(440) 835-3040
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	(610) 832-9585
AWCI	AWCI International (Association of the Wall and Ceiling Industries International) www.awci.org	(703) 534-8300
AWCMA	American Window Covering Manufacturers Association (Now WCSC)	
AWI	Architectural Woodwork Institute www.awinet.org	(800) 449-8811 (703) 733-0600
AWPA	American Wood-Preservers' Association www.awpa.com	(334) 874-9800
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association www.awwa.org	(800) 926-7337 (303) 794-7711
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	(212) 297-2122
BIA	Brick Industry Association (The) www.bia.org	(703) 620-0010

BICSI	BICSI www.bicsi.org	(813) 979-1991
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International) www.bifma.com	(616) 285-3963
BISSC	Baking Industry Sanitation Standards Committee www.bissc.org	(773) 761-4100
	Cast Stone Institute www.caststone.org	(770) 972-3011
CCC	Carpet Cushion Council www.carpetcushion.org	(203) 637-1312
CDA	Copper Development Association Inc. www.copper.org	(800) 232-3282 (212) 251-7200
CEA	Canadian Electricity Association www.canelect.ca/connections_online/home.htm	(613) 230-9263
CFFA	Chemical Fabrics & Film Association, Inc. www.chemicalfabricsandfilm.com	(216) 241-7333
CGA	Compressed Gas Association www.cganet.com	(703) 788-2700
CGSB	Canadian General Standards Board w3.pwgsc.gc.ca/cgsb	(800) 665-2472 (819) 956-0425
CIMA	Cellulose Insulation Manufacturers Association www.cellulose.org	(888) 881-2462 (937) 222-2462
CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org	(301) 596-2583
CPA	Composite Panel Association www.pbmdf.com	(301) 670-0604
CPPA	Corrugated Polyethylene Pipe Association www.cppa-info.org	(800) 510-2772 (202) 462-9607
CRI	Carpet & Rug Institute (The) www.carpet-rug.com	(800) 882-8846 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200

CSA	CSA International (Formerly: IAS - International Approval Services) www.csa-international.org	(800) 463-6727 (416) 747-4000
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
CSSB	Cedar Shake & Shingle Bureau www.cedarbureau.org	(604) 820-7700
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute) www.cti.org	(281) 583-4087
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EIA	Electronic Industries Alliance www.eia.org	(703) 907-7500
EIMA	EIFS Industry Members Association www.eima.com	(800) 294-3462 (770) 968-7945
EJCDC	Engineers Joint Contract Documents Committee www.asce.org	(800) 548-2723 (703) 295-6300
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
ESD	ESD Association www.esda.org	(315) 339-6937
FCI	Fluid Controls Institute www.fluidcontrolsintstitute.org	(216) 241-7333
FIBA	Federation Internationale de Basketball Amateur (The International Basketball Federation) www.fiba.com	41 22 545 00 00
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation) www.fivb.ch	41 21 345 35 35
FM	Factory Mutual System (Now FMG)	
FMG	FM Global (Formerly: FM - Factory Mutual System) www.fmgglobal.com	(401) 275-3000
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc. www.floridarroof.com	(407) 671-3772
FSA	Fluid Sealing Association	(610) 971-4850

	www.fluidsealing.com	
FSC	Forest Stewardship Council www.fsc.org	52 951 5146905
GA	Gypsum Association www.gypsum.org	(202) 289-5440
GANA	Glass Association of North America www.glasswebsite.com	(785) 271-0208
GRI	(Now GSI)	
GS	Green Seal www.greenseal.org	(202) 872-6400
GSI	Geosynthetic Institute www.geosynthetic-institute.org	(610) 522-8440
HI	Hydraulic Institute www.pumps.org	(888) 786-7744 (973) 267-9700
HI	Hydronics Institute www.gamanet.org	(908) 464-8200
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)	
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
HPW	H. P. White Laboratory, Inc. www.hpwhite.com	(410) 838-6550
IAS	International Approval Services (Now CSA International)	
IBF	International Badminton Federation www.intbadfed.org	441-24 223- 4904
ICEA	Insulated Cable Engineers Association, Inc. www.icea.net	(770) 830-0369
ICRI	International Concrete Repair Institute, Inc. www.icri.org	(847) 827-0830
IEC	International Electrotechnical Commission www.iec.ch	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
IESNA	Illuminating Engineering Society of North America www.iesna.org	(212) 248-5000

IGCC	Insulating Glass Certification Council www.igcc.org	(315) 646-2234
IGMA	Insulating Glass Manufacturers Alliance (The) www.igmaonline.org	(613) 233-1510
ILI	Indiana Limestone Institute of America, Inc. www.iliai.com	(812) 275-4426
ISO	International Organization for Standardization www.iso.ch	41 22 749 01 11
ISSFA	International Solid Surface Fabricators Association www.issfa.net	(702) 567-8150
ITS	Intertek www.intertek.com	(800) 345-3851 (607) 753-6711
ITU	International Telecommunication Union www.itu.int/home	41 22 730 51 11
KCMA	Kitchen Cabinet Manufacturers Association www.kcma.org	(703) 264-1690
LMA	Laminating Materials Association (Now part of CPA)	
LPI	Lightning Protection Institute www.lightning.org	(800) 488-6864 (847) 577-7200
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MFMA	Maple Flooring Manufacturers Association www.maplefloor.org	(847) 480-9138
MFMA	Metal Framing Manufacturers Association www.metalframingmfg.org	(312) 644-6610
MH	Material Handling (Now MHIA)	
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190
MIA	Marble Institute of America www.marble-institute.com	(440) 250-9222
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc. www.mss-hq.com	(703) 281-6613

NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(312) 332-0405
NACE	NACE International (National Association of Corrosion Engineers International) www.nace.org	(281) 228-6200
NADCA	National Air Duct Cleaners Association www.nadca.com	(202) 737-2926
NAGWS	National Association for Girls and Women in Sport www.aahperd.org/nagws/	(800) 213-7193, ext. 453
NAIMA	North American Insulation Manufacturers Association (The) www.naima.org	(703) 684-0084
NBGQA	National Building Granite Quarries Association, Inc. www.nbgqa.com	(800) 557-2848
NCAA	National Collegiate Athletic Association (The) www.ncaa.org	(317) 917-6222
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NCPI	National Clay Pipe Institute www.ncpi.org	(262) 248-9094
NCTA	National Cable & Telecommunications Association www.ncta.com	(202) 775-3550
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	InterNational Electrical Testing Association www.netaworld.org	(303) 697-8441
NFHS	National Federation of State High School Associations www.nfhs.org	(317) 972-6900
NFPA	NFPA (National Fire Protection Association) www.nfpa.org	(800) 344-3555 (617) 770-3000
NFRC	National Fenestration Rating Council	(301) 589-1776

www.nfrc.org

NGA	National Glass Association www.glass.org	(703) 442-4890
NHLA	National Hardwood Lumber Association www.natlhardwood.org	(800) 933-0318 (901) 377-1818
NLGA	National Lumber Grades Authority www.nlga.org	(604) 524-2393
NOFMA	National Oak Flooring Manufacturers Association www.nofma.org	(901) 526-5016
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	(888) 846-7622 (301) 587-1400
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010
NSSGA	National Stone, Sand & Gravel Association www.nssga.org	(800) 342-1415 (703) 525-8788
NTMA	National Terrazzo & Mosaic Association, Inc. www.ntma.com	(800) 323-9736 (540) 751-0930
NTRMA	National Tile Roofing Manufacturers Association (Now TRI)	
NWWDA	National Wood Window and Door Association (Now WDMA)	
OPL	Omega Point Laboratories, Inc. www.opl.com	(800) 966-5253 (210) 635-8100
PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDCA	Painting & Decorating Contractors of America www.pdca.com	(800) 332-7322 (314) 514-7322
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (978) 557-0720
PGI	PVC Geomembrane Institute http://pgi-tp.ce.uiuc.edu	(217) 333-3929
PTI	Post-Tensioning Institute www.post-tensioning.org	(602) 870-7540
RCSC	Research Council on Structural Connections	(800) 644-2400

	www.boltcouncil.org	(312) 670-2400
RFCI	Resilient Floor Covering Institute www.rfci.com	(301) 340-8580
RIS	Redwood Inspection Service www.calredwood.org	(888) 225-7339 (415) 382-0662
RTI	(Formerly: NTRMA - National Tile Roofing Manufacturers Association) (Now TRI)	
SAE	SAE International www.sae.org	(724) 776-4841
SDI	Steel Deck Institute www.sdi.org	(847) 462-1930
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SEFA	Scientific Equipment and Furniture Association www.sefalabs.com	(516) 294-5424
SEI	Structural Engineering Institute www.seinstitute.com	(800) 548-2723 (703) 295-6195
SGCC	Safety Glazing Certification Council www.sgcc.org	(315) 646-2234
SIA	Security Industry Association www.siaonline.org	(703) 683-2075
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)	
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMA	Screen Manufacturers Association www.smacentral.org	(561) 533-0991
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SMPTE	Society of Motion Picture and Television Engineers www.smpte.org	(914) 761-1100
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division) www.sprayfoam.org	(800) 523-6154

SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SPI/SPFD	Society of the Plastics Industry, Inc. (The) Spray Polyurethane Foam Division (Now SPFA)	
SPRI	SPRI (Single Ply Roofing Institute) www.spri.org	(781) 647-7026
SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630
SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(877) 281-7772 (412) 281-2331
STI	Steel Tank Institute www.steeltank.com	(847) 438-8265
SWI	Steel Window Institute www.steelwindows.com	(216) 241-7333
SWRI	Sealant, Waterproofing, & Restoration Institute www.swrionline.org	(816) 472-7974
TCA	Tile Council of America, Inc. www.tileusa.com	(864) 646-8453
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance www.tiaonline.org	(703) 907-7700
TMS	The Masonry Society www.masonrysociety.org	(303) 939-9700
TPI	Truss Plate Institute, Inc. www.tpinst.org	(608) 833-5900
TPI	Turfgrass Producers International www.turfgrasssod.org	(800) 405-8873 (847) 705-9898
TRI	Tile Roofing Institute (Formerly: RTI - Roof Tile Institute) www.tilerroofing.org	(312) 670-4177
UL	Underwriters Laboratories Inc. www.ul.com	(800) 285-4476 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association www.uni-bell.org	(972) 243-3902
USAV	USA Volleyball www.usavolleyball.org	(888) 786-5539 (719) 228-6800

USGBC	U.S. Green Building Council www.usgbc.org	(202) 828-7422
USITT	United States Institute for Theatre Technology, Inc. www.usitt.org	(800) 938-7488 (315) 463-6463
WASTEC	Waste Equipment Technology Association www.wastec.org	(800) 424-2869 (202) 244-4700
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCMA	Window Covering Manufacturers Association (Now WCSC)	
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association) www.windowcoverings.org	(800) 506-4636 (212) 661-4261
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (847) 299-5200
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California) www.wicnet.org	(916) 372-9943
WIC	Woodwork Institute of California (Now WI)	
WMMPA	Wood Moulding & Millwork Producers Association www.wmmpa.com	(800) 550-7889 (530) 661-9591
WSRCA	Western States Roofing Contractors Association www.wsrca.com	(800) 725-0333 (650) 548-0112
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

BOCA	BOCA International, Inc. (See ICC)	
CABO	Council of American Building Officials (See ICC)	
IAPMO	International Association of Plumbing and Mechanical Officials	(909) 472-4100

www.iapmo.org

ICBO International Conference of Building Officials
(See ICC)

ICBO ES ICBO Evaluation Service, Inc.

(See ICC-ES)

ICC International Code Council (703) 931-4533
(Formerly: CABO - Council of American Building Officials)
www.iccsafe.org

ICC-ES ICC Evaluation Service, Inc. (800) 423-6587
www.icc-es.org (562) 699-0543

NES National Evaluation Service
(See ICC-ES)

SBCCI Southern Building Code Congress International, Inc.
(See ICC)

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE Army Corps of Engineers
www.usace.army.mil

CPSC Consumer Product Safety Commission (800) 638-2772
www.cpsc.gov (301) 504-6816

DOC Department of Commerce (202) 482-2000
www.commerce.gov

DOD Department of Defense (215) 697-6257
www.dodssp.daps.mil

DOE Department of Energy (202) 586-9220
www.eren.doe.gov

EPA Environmental Protection Agency (202) 272-0167
www.epa.gov

FAA Federal Aviation Administration (202) 366-4000
www.faa.gov

FCC Federal Communications Commission (888) 225-5322
www.fcc.gov

FDA Food and Drug Administration (888) 463-6332

	www.fda.gov	
GSA	General Services Administration www.gsa.gov	(800) 488-3111 (202) 501-1888
HUD	Department of Housing and Urban Development www.hud.gov	(202) 708-1112
LBL	Lawrence Berkeley National Laboratory	(510) 486-4000
	www.lbl.gov	
NCHRP	National Cooperative Highway Research Program (See TRB)	
NIST	National Institute of Standards and Technology www.nist.gov	(301) 975-6478
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
PBS	Public Building Service (See GSA)	
PHS	Office of Public Health and Science http://phs.os.dhhs.gov	(202) 690-7694
RUS	Rural Utilities Service (See USDA)	(202) 720-9540
SD	State Department www.state.gov	(202) 647-4000
TRB	Transportation Research Board www.nas.edu/trb	(202) 334-2934
USDA	Department of Agriculture www.usda.gov	(202) 720-2791
USPS	Postal Service www.usps.com	(202) 268-2000
CBHF	State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation www.dca.ca.gov/bhfti	(800) 952-5210 (916) 574-2041
CPUC	California Public Utilities Commission www.cpuc.ca.gov	(415) 703-2782
TFS	Texas Forest Service Forest Products Laboratory http://txforests-service.tamu.edu	(936) 639-8180

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES, CONTROLS, AND TREE PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes requirements for temporary utilities, support facilities, and security and protective fencing.
- B. Related Sections include the following:
 - Division 1 Section "Summary" for other work restrictions.
 - Division 1 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
 - Division 1 Section "Execution Requirements" for progress cleaning requirements.
 - Divisions 2 through 49 Sections

1.3 TEMPORARY ELECTRICAL & WATER SERVICE:

- A. General: Allow other entities to use temporary services and facilities without cost, including, but not limited to, Project Manager/Engineer and consultants, suppliers, manufacturers, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Electric Power Service: Contractor to provide. Coordinate with Resident Engineer.
- C. Water Service: Contractor to provide. Coordinate with Resident Engineer.

1.4 SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

- A. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top rails.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service.
 - 1. Arrange with the Resident Engineer for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Coordinate with Resident Engineer on connection to existing fire hydrant. Contractor to arrange all necessary approvals with entities having jurisdiction.
- C. Sanitary Facilities: Contractor shall provide a 'porta-potty' for laborer use. Coordinate with Resident Engineer for location.
- D. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Install electric power service overhead, unless otherwise indicated.
 - 2. Cellular Service: Contractor shall carry a cellular phone for communication with County Project Manager/Resident Engineer, sub-consultants, vendors, etc. while in the field.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
 - 2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas in same location as permanent roads and paved areas. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
 - 1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
 - 2. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
 - 3. Prepare subgrade and install subbase and base for temporary roads and paved areas.
 - 4. Recondition base after temporary use, including removing contaminated material, regrading, proof rolling, compacting, and testing.
 - 5. Repair existing pavement scheduled to remain that has been damaged due to construction operations.
- C. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 - 1. Maintain access for fire-fighting equipment.
- D. Parking: Provide temporary parking areas for construction personnel. Coordinate with Resident Engineer on approved locations.
- E. Waste Disposal Facilities: Comply with requirements specified in Division 1 Section "Construction Waste Management."
- F. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

- B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust, according to requirements of authorities having jurisdiction.
 - 1. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Tree and Plant Protection: Install temporary fencing located outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- E. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials. Contractor shall coordinate with Project Manager/Engineer on County requirements prior to engaging a pest-control service and prior to performing pest-control.
- F. Site Enclosure Fence: Before construction operations begin, furnish and install 6' ht. chain link site enclosure fence in a manner that will prevent people and animals from easily entering site except by locking entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
- G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
 - 1. Prohibit smoking in construction areas.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.

- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction, either existing or new, that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor.
 - 2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where area is intended for landscape development, remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and walks, as required by project manager/engineer. Till all planting areas to a minimum of 24-inch depth and recompact to 85% compaction to prepare for plant and/or irrigation installation.
 - 3. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section "Closeout Procedures."

Payment: The contract unit prices paid for work shall include full compensation for furnishing all labor, materials, tools, equipment, delivery and incidentals as identified on the drawings and in these technical specifications, complete, in-place and doing all the work involved in this Section including installation of temporary construction fencing, if necessary, tree protection fencing, temporary water and electrical connections, etc., and providing any specialty tools as required, and no additional compensation will be allowed therefore.

END OF SECTION

SECTION 01 54 00

CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous construction waste.
 - 2. Recycling nonhazardous construction waste.
 - 3. Disposing of nonhazardous construction waste.
- B. Related Sections include the following:
 - 1. Section 01 50 00 "Temporary Facilities and Controls" for environmental- protection measures during construction.
 - 2. Section 02 41 00 "Demolition & Tree/Vegetation Removal" for removal of tree stumps, vegetation, etc.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction operations. Construction waste includes packaging.
- B. Disposal: Removal off-site of construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- C. Recycle: Recovery of construction waste for subsequent processing in preparation for reuse.
- D. Salvage: Recovery of construction waste and subsequent sale or reuse in another facility.
- E. Salvage and Reuse: Recovery of construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Develop waste management plan that results in end-of-Project rates for salvage/recycling of 75 percent by weight of total waste generated by the Work.

- B. Salvage/Recycle Requirements: Owner's goal is to salvage and recycle as much non-hazardous construction waste as possible including the following materials:

1. Construction Waste:

- a. Site-clearing waste.
- b. Concrete
- c. Lumber and concrete formwork
- d. Metals, such as rebar
- e. Piping.
- f. Electrical conduit.
- g. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Plastic pails.

1.5 SUBMITTALS

- A. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- B. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- C. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- D. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
 - 1. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 RECYCLING CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.2 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Site-Clearing Wastes: Chip brush, branches, and trees on-site.

C. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.3 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

PAYMENT: The contract unit prices paid for work shall include full compensation for furnishing all labor, materials, tools, equipment, delivery and incidentals as identified on the drawings and in these technical specifications, complete, in-place and doing all the work involved and providing any specialty tools as required, and no additional compensation will be allowed therefore.

END OF SECTION

SECTION 01 55 00

MOBILIZATION & DEMOBILIZATION

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Mobilization and Demobilization.
 - 2. Site Security and Access.
 - 3. Contractor Staging and Parking.
 - 4. Construction Staking.

1.2 REFERENCE STANDARDS

- A. All references made within these technical provisions to the various standards, requirements and elements shown in Section 1.1.A shall be limited to construction materials, methods, and all work incidentals to the item of work only. Measurements and Payments shall be established as shown within Part 4 of these special provisions only.
- B. The following is a list of standards which may be referenced in this section: California Department of Transportation, Manual on Uniform Traffic Control Devices (CA MUTCD), 2012 Edition.

1.3 SUBMITTALS

- A. Prior to the start of construction, the Contractor, with the County Representative in attendance, shall videotape/ log the conditions of the gravel entry road(s) and areas to be used for hauling demolition materials and delivery of materials. The videotape/ log shall be prepared by the Contractor and submitted to the County on a CD labeled "Lakeside Equestrian Facility Existing Conditions, Haul Route and Area Condition Log, date: mm/dd/yyyy." The costs of performing the condition survey and preparing the videotape / log shall be considered as incidental to other items of work and no additional compensation will be made.
- B. Submittals shall be in accordance with the requirements of the Standard Specifications. Review or acceptance, as specified, by the County Project Manager is required prior to the commencement of work.
- C. Catalog Cuts: Submit for each pre-manufactured item.
- D. Shop Drawings: Submit shop drawings when required on the plans.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All materials shall be delivered and unloaded at the job site in such a manner that no damage

occurs to the product during hauling, handling or unloading, storage and installation.

PART 2 – PRODUCTS

2.1 CONSTRUCTION STAKING

- A. Standard ground stakes are referenced with 1" x 1" wood "Ginnie" exposed.
- B. 48" Lath stakes used as guard stakes for extra visibility.

PART 3 – EXECUTION

3.1 MOBILIZATION

- A. This item shall consist of payment for mobilization, demobilization, preparatory work, and staging area development and is intended to compensate the Contractor for operations required to start up and close down the project, including but not limited to:
 - 1. Provide the required submittals after received Notice of Award
 - 2. Obtain any required permits
 - 3. Set up of Contractor field office
 - 4. Establishment of Contractor Yard or Staging Area
 - 5. Movement of equipment
 - 6. Movement of personnel
 - 7. Supplies
 - 8. Supplies and incidentals for the project site
 - 9. Payment of Bonds and Insurance for the project
 - 10. Utilities required for the Site
 - 11. All other work required to be performed prior to the start of operations and construction.
 - 12. Securing of the Contractor Yard or Staging Area.
 - 13. All temporary chain-link fencing and gate(s) as required on this Project for the safety of the public, security of the staging area and Contractor Office.
 - 14. Demobilization
 - 15. Coordination with Others

- 16. Shared haul routes
- 17. Clean up
- 18. Project close out
- B. All facilities, plants and equipment which are established at or brought to the work site by the Contractor shall conform to the provisions of this Section unless the Representative specifically directs in writing otherwise. The Contractor shall be solely responsible for the adequacy of all plants, facilities, and equipment.

3.2 SITE SECURITY AND ACCESS

- A. Access to the Site
 - 1. The Contractor's access to the site shall be as shown on the Drawings. The Contractor shall maintain traffic control to and from the various areas of the Work. The Contractor shall immediately clean any debris deposited along any route used as a result of its construction traffic. All debris resulting from construction activities shall be legally disposed of off site at no additional cost to the Owner.
- B. Inspection
 - 1. If required by the County, at any time during the course of the Work, trained Contractor supplied personnel shall search all vehicles associated with the project entering the Work site.
- C. The Contractor shall provide a sufficient quantity of inspection staff as to cause no delay in the through put of materials and deliveries to the project site when inspection may be required.

3.3 CONTRACTOR HAUL ROUTES, STAGING AND PARKING

- A. On-Site staging and parking shall be relocated by the Contractor at the Contractor's expense to accommodate project construction phasing, as necessary. Initial setup and maintenance of the Contractor staging and parking area shall be included in Mobilization.
- B. Any damage along haul routes, and within staging and parking areas shall be repaired (to the condition prior to the Contractor's use) by the Contractor prior to the completion of the phase for which the route and area is used.

3.4 TRACK/TRAIL CONSTRUCTION STAKING

- A. Utilize topographic survey prepared by the County of San Diego for the trail alignment as provided in the CAD drawings.
- B. Construction staking should include the horizontal alignment of the trail. Provide stakes at 25-foot increments and as needed for accurate layout of final construction. Pound stakes into the ground so that a 1" x 1" square "Ginnie" is exposed above ground.
- C. Provide a 10 foot offset from the centerline of the trail and stake accordingly.

- D. Identify the beginning and end of horizontal curves.

3.6 CONTRACTOR QUALITY CONTROL.

- A. The Contractor shall be responsible for developing and implementing a Contractor Quality Control Program including but not limited to inspection and testing to assure compliance with the requirements of this section and in accordance with County Special Conditions.

PART 4 – PAYMENT

- A. The Contract lump sum price paid for "Mobilization and Demobilization" shall include all costs for mobilization and demobilization. These partial payments will be made as the work progresses and shall be full compensation for furnishing all labor, materials, equipment, tools and incidentals for doing all the work associated with mobilization and demobilization, which is complete and in-place. No additional payment will be made therefor. The lump sum payments for these items of work will be made in accordance with the following provisions:
 - 1. The first partial payment for "Mobilization and Demobilization" will be made at thirty-five (35) percent of the lump sum price bid at such time that: the project submittals which include but not limited to safety submittals, the critical path method schedule, schedule of value, construction waste management plan, traffic control plan, contractor quality control program, have been provided and approved by the County; insurance, bonds and permits have been provided. All conditions shall be in accordance with General and Special Conditions, respectively.
 - 2. The second partial payment for "Mobilization and Demobilization" will be made at thirty-five (35) percent of the lump sum price bid at such time the Field Offices and the Contractor Yard have been set up and functional with equipment and supplies; and the contractor's mobilization of the initial personnel, equipment, and materials have been completed.
 - 3. The final partial payment for "Mobilization and Demobilization" will be made at thirty (30) percent of the lump sum price bid at such time that construction is complete and accepted by the County Project Manager. This will include the Contractor's demobilization costs including final clean-up, and the Contractor's record drawings and mark-ups have been submitted and accepted by the County. This final payment shall be full compensation for furnishing all labor, materials, equipment and for completing all the work associated with demobilization.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 56 00

TEMPORARY EROSION & SEDIMENTATION CONTROL (UTILIZING A WATER POLLUTION CONTROL PLAN (WPCP))

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
- B. Standard specifications, Section 7-1.01G – Water Pollution
- C. Construction Site Best Management Practices (BMP's) Manual, by CalTrans
- D. County of San Diego Best Management Practices Manual

1.2 SUMMARY

- A. Contractor shall provide and maintain methods, equipment, and temporary construction, as necessary to provide controls over environmental conditions at the construction site and adjacent areas. Remove physical evidence of temporary facilities at completion of work.
- B. Stormwater Runoff: Contractor shall provide compensation to the Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.
- C. Contractor shall provide a trained and qualified individual according to County and jurisdictional agencies' standards to monitor BMP's daily and provide a WPCP to the Project Manager for approval.

1.3 NOISE CONTROL

- A. Contractor's vehicles and equipment shall be such as to minimize noise to the greatest degree practicable. No internal combustion engine shall be operated on the project without a muffler of a type recommended by the manufacturer. Noise levels shall conform to the latest OSHA standards and in no case will noise levels be permitted which interfere with the work of the owner or others. Noise levels shall comply with city, county, and state noise limitation requirements. Diesel and gasoline engine driven generators used for powering any and all equipment shall be located, to the satisfaction of the engineer, such that any exhaust or mechanical noise is directed away from populated areas. Invited, the contractor shall, as directed by the engineer, relocate or modify his equipment in order to alleviate the noise problem.

1.4 DUST CONTROL

- A. Contractor shall be responsible for controlling objectionable dust caused by its operation of vehicles and equipment, clearing or for any reason whatever. Contractor shall apply water and

calcium chloride or use other methods subject to the engineer's approval, which will keep dust in the air to a minimum. The contractor's operations shall comply with Air Quality Control Board and Air Pollution Control District (APCD) requirements.

1.5 PEST AND RODENT CONTROL

- A. Contractor shall provide rodent and pest control as necessary to prevent infestation of construction or storage area. Employ methods and use materials, which will not adversely affect conditions at the site or on adjoining properties.

1.6 WATER CONTROL

- A. Contractor shall provide methods to control surface water and water from excavations and structures to prevent damage to the work, the site, or adjoining properties.
- B. Control fill, grading and ditching to direct water away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper runoff courses so as to prevent any erosion, damage or nuisance. Water control shall comply with local and federal permitting requirements.
- C. Contractor shall provide, operate and maintain equipment and facilities of adequate size to control surface water.
- D. Contractor shall dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas and in conformance with all environmental requirements.

1.7 POLLUTION CONTROL

- A. Contractor shall provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.
- B. Contractor shall provide equipment and personnel, and perform emergency measures required to contain any spillages, and to remove soils or liquids contaminated as a result of contractor's activities.
 - 1. Excavate and dispose offsite any contaminated soil or liquid and replace with suitable compacted fill and topsoil.
- C. Contractor shall take special measures to prevent harmful substances from entering public waters.
 - 1. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.
- D. Contractor shall provide systems for control of atmospheric pollutants.
 - 1. Prevent toxic concentrations of chemicals.

2. Prevent harmful dispersal of pollutants into the atmosphere.
- E. All contractor equipment used during construction shall conform to all current federal, state and local laws and regulations.

3.1 EROSION CONTROL

- A. Contractor shall plan and execute construction and earthwork by methods to control surface drainage from cuts and fills and from borrow and waste disposal areas, and to prevent erosion and sedimentation.
1. Hold the areas of bare soil exposed at one time to a minimum.
 2. Provide temporary control measures such as berms, dikes and drains.
- B. Contractor shall construct fills and waste areas by selective placement to eliminate surface silts or clays, which will erode.
- C. Contractor shall periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion.

3.2 WATER POLLUTION CONTROL

- A. The Contractor shall comply with all applicable standards, orders, or requirements issued under Section 508 of the Clean Water Act (33 U.S.C. 1368) Executive Order 11738, State of California Erosion and Sedimentation Control Manual, and the County of San Diego Best Management Practices Standards: Appendix N, Stormwater Best Management Practices, BMP's. Water pollution control work shall conform to the requirements in the "Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP)", both to be prepared by the Contractor as part of the Contract at no additional cost to the Owner. "Preparation Manual" and the "Construction Site Best Management Practices (BMPs) Manual," and addenda thereto issued up to, and including, the date of advertisement of the project, hereafter referred to respectively as the "Preparation Manual" and the "Construction Site BMP Manual" and collectively as the "Manuals." Copies of these manuals are available from Caltrans Publications Distribution Unit. Publications staff can be reached at: (916) 323-5606, (916) 445-3520 or by fax at: (916) 324-8997 or California Department of Transportation Publication Distribution Unit, 1900 Royal Oaks Drive Sacramento, CA 95815- 3800. Copies of the Manuals may also be obtained from the Department of Transportation's Internet Web Site at:
<http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm>.
- B. The Contractor shall exercise extreme care when excavating adjacent to existing sewer systems. The Contractor shall include in his bid all labor and materials necessary to protect existing sewer facilities. If no pay item is provided in the contract for this work, full compensation for such work shall be considered as included in the prices bid for other items of work. The Contractor will be liable for all damages and fines associated with sewage spills caused by improper support or damage to the existing sewer facilities.

3.3 WATER POLLUTION CONTROL SITE MANAGEMENT

- A. The Contractor shall comply with all federal, state and county standards, orders and requirements. The following is definition to terms used in this section:
1. Best Management Practice (BMP): (1) A measure that is implemented to protect water quality and reduce the potential for pollution associated with storm water runoff. (2) Any program, technology, process, siting criteria, operating method, measure, or device that controls, prevents, removes, or reduces pollution.
 2. Clean Water Act (CWA): The Federal Water Pollution Control Act entered in 1972 by Public Law 92-500 and amended by the Water Quality Act of 1987. The Clean Water Act prohibits the discharge of pollutants to Waters of the United States unless said discharge is in accordance with an NPDES permit. The 1987 amendments include guidelines for regulating municipal, industrial, and construction storm water discharges under the NPDES program.
 3. Maximum Extent Practicable (MEP): Means the technology-based standard established by Congress in the Clean Water Act 402(p) (3) (B) (iii) that municipal discharges of urban runoff discharges must meet. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional lines of defense).
 4. Storm Water Management (SWM): The recognition of adverse drainage resulting from altered runoff and the solutions resulting to mitigate, abate, or reverse those adverse results.
 5. Storm Water Pollution Prevention Plan (SWPPP): A plan required by storm water regulations or permits that includes site map(s), an identification of construction/contractor activities that could cause pollutants in the storm water, and a description of measures or practices to control these pollutants.
 6. Water Pollution Control Plan (WPCP): This plan is to show BMPs placed to the MEP for a site where project area is less than 1 acre and SWPPPs are not required.”
 7. Water Pollution Control Site Management Plan (WPCSMP): A combination of a WPCP and site management that together effectively control pollution leaving a construction site to the MEP.
- B. The Contractor’s Water Pollution Control Site Management plan shall be submitted at the preconstruction meeting, and Construction Manager approval is required prior to start on any construction activities.
- C. At a minimum, the Contractor shall be required to do the following:
1. The Contractor shall designate a qualified person who is trained and competent in the use of BMPs and shall be on site daily, although not necessarily full time, to evaluate the conditions of the site with respect to storm water pollution prevention.
 2. This person shall implement the conditions of the WPCP, contract documents and local ordinances with respect erosion and sediment control and other waste management regulations.
 3. This person is responsible for monitoring the weather and implementation of any emergency plans as needed. The weather shall be monitored (use National Weather Forecast <http://www.wrh.noaa.gov/sandiego/index.shtml>) on a 5-day forecast plan and a full BMP protection plan shall be activated when there is a 40% chance of rain.

4. This person is responsible for overseeing any site grading, operations, and evaluating the effectiveness of the BMPs. This person shall modify the BMPs as necessary to keep the dynamics of the site in compliance. This person or other designated site management staff is responsible to check the BMPs routinely for maintenance. A site plan reflecting the Water Pollution Control Site Management Plan shall be posted on the construction site at all times and updated daily.
 5. This person shall be qualified to perform these activities according to all County, jurisdictional agency, and regulation requirements.
- D. Educate all subcontractors and employees about storm water pollution and mitigation measures needed during various construction activities to prevent the impact of construction discharges. Education requirements shall be in accordance with Section F.2.J of the San Diego Regional Water Quality Control Board (SDRWQCB) Order No. 2001-1, dated February 21, 2001. The Contractor shall insure that all personnel are trained in basic urban runoff management. A log of the attendees and the educational materials shall be available upon request of the Construction Manager.
 - E. Protect all new and existing storm water conveyance system structures from sedimentation and concrete rinse, or other construction related debris and discharges with gravel bags and filter fabric or by any other equal product that is approved by the Construction Manager.
 - F. Within your WPCP show where concrete wash out, vehicle maintenance, staging, and storage areas will be located. Also, show pollutant control measures to be utilized to keep construction waste in these designated areas, including measures to reduce the tracking of sediment onto public and private roads.
 - G. Inspect monthly all pollutant control measures installed to mitigate construction activities during the dry season (May 1 through September 30). The Contractor shall include in his/her Water Pollution Control Site Management documentation that these pollutant control measures were inspected for the duration of the project with each progress payment submitted to the Construction Manager.
 - H. Maintain all pollutant control measures installed to mitigate construction activities daily or as requested by the Construction Manager.
 - I. All pollutant control measures shall be inspected weekly, before and after every rain event, and every 24 hours during any prolonged rain event. The Contractor shall include in his/her Water Pollution Control Site Management documentation that these pollutant control measures were inspected for the duration of the project with each progress payment submitted to the Construction Manager.
 - J. All pollutant control measures shall be maintained daily, before and after every rain event and every 24 hours during any prolonged rain event. The Contractor shall maintain and repair all pollutant control measures as soon as possible after the conclusion of each rain event as worker safety allows.
 - K. If an unmitigated non-storm drain water discharge leaves the project site, the Contractor shall immediately stop the activity causing the discharge and mitigate the discharge. The Contractor shall also immediately notify the Construction Manager of the discharge.

As soon as practical, any and all waste material, sediment and debris from each unattended discharge shall be removed from the drainage system by the Contractor.

- L. All work associated with the above-mentioned requirements as described under this Section shall be included in the various bid items.

3.4 3.4 PERFORMANCE STANDARDS

- A. The County will evaluate the adequacy of the Contractor's site management for storm water pollution prevention, inclusive of BMP implementation, on construction sites based on performance standards for storm water. Performance standards shall include:

1. No observable discharge of sediment or other pollutions in runoff from the site.
2. Slope erosion shall be managed and contained utilizing approved BMPs; if rills and gullies become evident they must be repaired immediately and additional BMPs added to correct the source.
3. Water velocity moving offsite must be manageable in order not to create flooding or other impacts downstream.
4. At any time of year, an inactive site must be fully protected from erosion and discharges of sediment. A site will be considered inactive if construction activities have ceased for a period of Seven (7) or more consecutive calendar days.
5. It is also the Contractor's responsibility at both active and inactive sites to implement a plan to address all potential non-storm water discharges.

B. Dry Season Requirements (May 1 through September 30):

1. Perimeter protection BMPs shall be installed and maintained to comply with the performance standards listed above.
2. Sediment control BMPs shall be installed and maintained to comply with the performance standards listed above.
3. BMPs to control sediment tracking shall be installed and maintained at on and off-site entrances/exits to comply with the performance standards listed above.
4. Material needed to install standby BMPs necessary to completely protect the exposed portions of the site from erosion, and to prevent sediment discharges, shall be stored on site.
5. The Contractor shall have an approved weather triggered action plan and have the ability to deploy standby BMPs as needed to completely protect the exposed portions of the site within 24 hours of prediction of a storm event (a predicted storm event is defined as a forecasted, 40% or greater chance of rain). On request, the Contractor shall provide proof of this capability that is acceptable to the Owner.
6. The area that can be trenched, cleared or graded and left exposed at one time is limited to the amount of acreage that the Contractor can adequately protect prior to a predicted storm event.

C. Rainy Season Requirements (October 1 through April 30): In addition to the requirements listed under the Dry Season Requirements, the following shall be required during the rainy season:

1. Erosion control BMPs shall be upgraded as necessary to provide sufficient protection for the 2-year storm event, most likely to occur, during the rainy season.
2. Perimeter protection and sediment control BMPs shall be upgraded as necessary to provide sufficient protection for storms likely to occur during the rainy season.
3. Physical or vegetation erosion control BMPs shall be installed and established for all completed construction facilities prior to the start of the rainy season, to comply with the performance standards listed in Subsection 1.8.B. These BMPs shall be maintained throughout the rainy season. If a selected BMP fails, it shall be repaired and improved, or replaced with an acceptable alternate as soon as it is safe to do so. The failure of a BMP shall indicate that the BMP, as installed, was not adequate for the circumstances in which it was used and the BMP shall be corrected or modified as necessary. Repairs or replacements must therefore put a more effective BMP in place.
4. The amount of exposed soil allowed at one time shall not exceed that which can be adequately protected by deploying standby erosion control and sediment control BMPs prior to a predicted storm event.
5. A disturbed area that is not completed but that is not being actively graded or excavated must be fully protected from erosion if left for 7 or more calendar days. The ability to deploy standby BMP materials shall not be considered sufficient protection for these areas. BMPs must actually be deployed.

D. Construction BMPs:

1. Unless specifically noted otherwise, it is the responsibility of the Contractor to select, install and maintain appropriate BMPs in accordance with these specifications. It is the contractor's responsibility to ensure that the BMPs are operational and working properly. Furthermore, the Contractor shall be held responsible for any citation and/or fine due discharges or malfunctioning of the BMPs. BMPs shall be installed in accordance with an industry recommended standard (for example: CalTrans or California Storm water BMP handbooks) or in accordance with the California General Permit for Construction Activities. The web site address for CalTrans is as follows:
 - CalTrans - WWW.DOT.CA.GOV/HQ/CONSTRUC/STORMWATER.HTML.
2. Depending on project scope and potential associated discharges, additional BMPs may be needed. If the Contractor proposes to use a BMP not listed in the bid items, approval from the county is required prior to installation.
3. If particular minimum BMPs are infeasible at any specific site, the County will require the implementation of other equivalent BMPs.

E. Pollution Control Measures for Equipment Maintenance, Fueling, Cleaning and Storage:

1. The WPCP shall include where and how pollution control measures for equipment maintenance, fueling, cleaning and storage will take place. This WPCP shall include drawings with descriptions showing pollution control measures to be utilized to keep any resulting waste in these designated areas and measures to dispose of this waste and prevent tracking onto public and private roads. If during construction operations, pollution control measures for equipment maintenance, fueling, cleaning and storage in the public or private right of way is unavoidable, measures similar to those used on off-site locations are to be followed. If any discharge leaves the control site, the Contractor shall immediately stop the activity, mitigate the discharge, and notify the Construction Manager.

2. The Construction Manager may allow the Contractor to fuel construction equipment outside of the designated areas, provided that the Contractor takes all necessary precaution measures to prevent any potential fuel spillage.
3. Locations of these activities are to be restored to their prior condition as soon as possible and no later than at construction completion.

F. Storage/Staging Areas Protection:

1. Storage / Staging areas shall be the responsibility of the Contractor. The staging area shall be a secure fenced area for the storage of materials and equipment during the construction period. Contractor is responsible for obtaining any permits, leases or any items necessary to obtain the Staging Area.
2. The Staging Area shall be enclosed with a temporary chain linked fence and gate. The fence fabric shall be nine (9) gage galvanized wire. The gate shall be securely locked with a chain and padlocks, during non-working hours. The County shall be given four (4) keys to the padlock. The fence and gate shall not be less than eight (8') feet high. The fence and gate shall be covered with a highly woven fabric or plastic green screen. The screen shall be securely attached to the fence with grommets. The total open area of the screen shall not be greater than twenty-five (25%) percent of the total fenced area. Any graffiti shall be removed within twenty-four hours. No fueling or maintenance shall be allowed in the staging area.
3. The Contractor shall be responsible for ensuring that all waste and debris generated during the period of construction is contained within the storage/staging area. No dust, oil, or contaminated run-off shall be allowed out of the staging/storage area. Perimeter and run-off control measures shall be installed around the staging/storage area.

G. Construction Entrances:

1. The entrance to the construction staging/storage areas shall have stabilized gravel entrances/roadways, metal pans to loosen dirt from tires, or the like, to reduce tracking and create a sediment barrier between the storage/staging area and the roadway as per regulations.

H. Temporary Straw Wattles:

1. As part of the WPCP, the Contractor shall show where and how temporary straw wattles will be utilized to stop sediment movement.
2. The wattles shall be inspected at least once per month in the dry season and weekly in the wet season, and immediately after each rainfall. Straw wattles that are damaged and become unsuitable for the intended purpose, as determined by the Construction Manager, shall be removed and replaced with new. Wattles and stakes shall be removed when no longer needed or as required by the Construction Manager. Contractor shall fill and compact stake holes and anchorage trench, remove sediment accumulation, and grade to blend with adjacent ground.

I. Temporary Concrete Washout:

1. Whenever required, temporary concrete washouts shall be constructed prior to any placement of concrete; maintained and later removed. Location of the temporary concrete washouts shall be shown on the WPCP. The facility shall be located away from construction traffic or access areas to prevent disturbance and tracking. Temporary

washout shall be located a minimum of 50 feet from downstream open drainage facilities, and any water course. The perimeter of the concrete washout shall be delineated by lath and flagging to prevent accidental access. Temporary concrete washout facilities shall be maintained daily or more often as needed. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete. Concrete waste materials shall be removed and disposed in accordance with the SSPWC.

2. When temporary concrete washout is no longer required for the work, the remaining concrete waste shall be removed and disposed of legally off-site. Materials for temporary concrete washout shall become the property of the Contractor and shall be removed from the site of the work and disposed of outside the project area per the SSPWC.
3. Trenches, depressions and pits caused by the removal of temporary concrete washout shall be backfilled in kind.
4. The Construction Manager may allow the Contractor to use the 55 gallons commercially available drums to disposed concrete washout, provided that all necessary protection measures are in place to prevent any spillage.

J. Temporary Gravel Bags:

1. Temporary gravel bags shall be installed, maintained, and later removed as approved by the Construction Manager. The Contractor will not be paid any additional money for the maintenance, removal and replacement of gravel bag at the same location.
2. Gravel bags fill material shall be one-half to one-inch Class 2 aggregate base, clean and free from clay and deleterious material. Gravel bag fabric shall be woven high density polyethylene fabric with a minimum unit weight of 5 oz./square yard. The fabric shall have a Mullen burst strength of at least 350 psi, conforming to the requirements of ASTM Designation D 3786, and an ultraviolet (UV) stability exceeding 70 percent. Gravel bags, when filled, shall have nominal dimensions (length x width x height) of 16 in. x 12 in. x 6 in., and a fill mass of 35 to 60 pounds. The Contractor shall use other methods if ponding will encroach in to the traffic or onto erodible surfaces and slopes. Flow from a severe storm shall not overtop the curb. Temporary gravel bags shall be maintained to provide for adequate sediment holding capacity. The Contractor shall remove the sediment behind the barrier when it reaches one-third the height of the barrier and immediately before and after each storm event. When no longer required for the intended purpose, temporary gravel bag barriers shall be removed from the site of work.

K. Stock Pile Protection:

1. The Contractor shall avoid placing stock piles in any drainage path. The Construction Manager may approve temporary stockpiling in a drainage path provided that measures are taken to allow unimpaired drainage and sediment transport is prevented. Regardless of the location of stockpiled materials, containment measures are to be employed to control dust and sediment movement arising from wind, rain, and/or runoff. Controlling measures includes but are not limited to covering the stockpiled material and the installation of protection around the perimeter of the stockpiled material during rain events and winds.

PART 2 - PRODUCTS

2.1 EROSION CONTROL MATERIALS:

- A. Straw Wattles: Shall be 8"-9" diameter tubular rolls in 10'-30' lengths, encased in durable netting, and weed free as provided by GreenFix America @ 800-929- 2184 or Earth Saver Erosion Control Products @ 530-662-7700 or approved equal.
- B. Gravel Bags: See Erosion Control Plan
- C. Temporary Concrete Washout: See 1.11 Performance Standards- H. above
- D. Vibratory plates at Construction entry: Shall be placed at construction entry to remove sediment from tires and reduce tracking onto the street. Comply with CalTrans or California Stormwater BMP standards.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Straw Wattles:
 - 1. Install straw wattles in plant beds or gravel bags on existing asphalt paving in linear rows as shown on plans with ends butting tightly.
 - 2. Provide 2" trench for placement of wattles to prevent runoff from undermining wattles.
 - 3. Stake to ground per manufacturer's recommendations.
 - 4. Wattles or gravel bags shall be removed from the site upon final project acceptance at end of 30-day maintenance/plant establishment period.
- B. Gravel bags:
 - 1. Install gravel bags on top of existing asphalt paving per Erosion Control Plan (WPCP).
- C. Vibratory Plates at Construction Entrance
 - 1. Shall be per placed at construction entry per CalTrans or California Stormwater BMP standards, during grading activities and per Erosion Control Plan.

PAYMENT: The contract unit prices paid for work of this section shall include full compensation for furnishing all labor, materials, tools, equipment, delivery and incidentals as identified on the drawings and in these technical specifications, complete, in-place and doing all the work involved in the installation of the straw wattles or gravel bags, vibratory plates at construction entrance, concrete washout facility, etc., and providing any specialty tools as required, and the creating and updating of the WPCP during the course of the project construction, and daily WPCP stormwater monitoring, and at no additional compensation will be allowed therefore.

END OF SECTION

SECTION 01 60 00
PRODUCT SUBSTITUTIONS AND “OR APPROVED EQUAL” REQUESTS – PRIOR TO BID
OPENING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section. Modifications to the specification requirements can only take place prior to the bid opening and submittals for consideration

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. Related Sections include the following:
 - 1. Division 1 Section "References" for applicable industry standards for products specified.
 - 2. Division 1 Section "Closeout Procedures" for submitting warranties for Contract closeout.
 - 3. Divisions 2 through 49 Sections for specific requirements for warranties on products and installations specified to be warranted.
- C. Payment: The contract unit prices paid for work shall include full compensation for furnishing all labor, materials, tools, equipment, delivery and incidentals as identified on the drawings and in these technical specifications, complete, in-place and doing all the work involved and providing any specialty tools as required, and no additional compensation will be allowed therefore. Construction document modifications created from a change in product is the responsibility of the contractor to correct and/or address. No additional compensation will be allowed.

1.3 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions or “Or Approved Equal”: A County approved pre-bid change in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. See Section 1.4 SUBMITTALS B below.

- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

- A. Substitution or "Or Approved Equal" Requests: Submit one electronic copy of each request for consideration. Identify product or fabrication or installation method to be replaced. Submit and comply with the following.
 - 1. Substitution or "Or Equal" Request Form: Use the form provided by the Owner at the end of this Section and submit to the Project Manager/Engineer a minimum of **15 days prior to the bid opening**.
 - 2. Documentation: Complete and provide documentation identified within the Product Substitution Form at the end of this specification. Attach additional documentation identifying the product, warranty, and compare your product to the current contract Part 5 specification requirements related to the material performance and requirement.
 - 3. Project Manager/Engineer's Action: If necessary, Project Manager/Engineer will request additional information or documentation for evaluation within 5 days of receipt of a request for Substitution or "Or Equal" submittal.
 - a. Form of Acceptance: Pre-Bid Addendum
 - b. Use product specified if Project Manager/Engineer cannot make a decision on use of a proposed substitution within time allocated.
- B. Comparable Product Requests: Following the Substitution Requests procedures identified above in 1.4

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger project improvements.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
 3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Product Warranties Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

1.8 PRODUCT SUBSTITUTIONS OR COMPARABLE PRODUCTS

- A. Timing: Substitutions, Comparable Products or "Or Approved Equal" products that are accepted will be issued within an addendum prior to the bid opening.
- B. Conditions: Project Manager/Engineer will consider Contractor's or Supplier's request for substitution when the Product Substitution Form and attached comparison to the specification requirements are completed and delivered to the County Project Manager. Refer to 1.4 A (above) for submittal comparison requirements.

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ATTACHMENT

SUBSTITUTION OR "OR APPROVED EQUAL" REQUEST FORM

TO: IESZIC FORMELLER, PARK PROJECT MANAGER
PROJECT: LAKESIDE EQUESTRIAN FACILITY

SPECIFIED ITEM: _____
 Section Page Paragraph Description

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the requests; applicable portions of the data are clearly identified.

Attached data also includes description of changes to Contract Documents, which proposed substitution would require for proper installation.

The undersigned states that the following paragraphs, unless modified on attachments, are correct:

1. The proposed substitution does not affect dimensions shown on Drawings.
2. The undersigned will pay for changes to the building design, including engineering design,
3. The proposed substitution will have no adverse affect on other work, directly related, or otherwise, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

SUBMITTED BY:

FOR USE BY PROJECT MANAGER:

Signature: _____

☐ Accepted ☐ Accepted as noted

Firm: _____

☐ Not Accepted ☐ Received too late

Address: _____

By: _____
Date: _____

Telephone: _____

Remarks: _____

Attachments:

- Related Part 5 detailed comparison documentation identifying the differences between this substitution submittal and the detailed requirements within the related specification.

END OF SECTION

SECTION 01 65 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. Related Sections include the following:
 - 1. Division 1 Section "References" for applicable industry standards for products specified.
 - 2. Division 1 Section "Closeout Procedures" for submitting warranties for Contract closeout.
 - 3. Divisions 2 through 49 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product, and Installer's name.
 - 1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
 - 2. Completed list within 10 days after date of commencement of the Work, submit one electronic copy of completed product list to the County Project Manager. Include a written explanation for omissions of data and for variations from Contract requirements.
 - 3. Project Manager/Engineer's Action: Project Manager/Engineer will respond in writing to Contractor within 10 days of receipt of completed product list. Project Manager/Engineer's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Project Manager/Engineer's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.
- B. Substitutions to proposed products: See 2.2.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Project Manager/Engineer will make selection.
 5. Where products are accompanied by the term "match sample," sample to be matched is Project Manager/Engineer's.
 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
 7. Available Products, or Or Equal Products: Where products are specified by name and accompanied by the terms "available products include," "or equal," or "or approved equal," or "or approved," comply with provisions in 2.2 "Product Substitutions" to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
1. Product: Where Specifications name a single product and manufacturer, only one brand or trade name was known to the Architect or the product was the 'best fit' or most suitable for the design. The term "or approved equal" is considered added to the named product. Provide the named product that complies with requirements or request a "Substitution."
 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, only one manufacturer or source was known to the Architect. Provide a product by the named manufacturer or source that complies with requirements or request a "Substitution."
 3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements, or request a "Substitution."
 4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements, or request a "Substitution."
 5. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in 2.2 "Product Substitutions" for consideration of an unnamed product or system.
 6. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply

- with provisions in 2.2 "Product Substitutions" for consideration of an unnamed product by the other named manufacturers.
7. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Project Manager/Engineer's sample. Project Manager/Engineer's decision will be final on whether a proposed product matches.
 - a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in 2.2 "Product Substitutions" for proposal of product.
 8. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
 - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Project Manager/Engineer will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
 - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Project Manager/Engineer will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Project Manager/Engineer will consider requests for substitution if items are no longer manufactured or available at time of construction or per 'B' below.
- B. Conditions: Project Manager/Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Project Manager/Engineer will return requests without action, except to record noncompliance with these requirements:
 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 2. Requested substitution does not require revisions to the Contract Documents.
 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 4. Substitution request is fully documented and properly submitted.
 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 7. Requested substitution is compatible with other portions of the Work.
 8. Requested substitution has been coordinated with other portions of the Work.
 9. Requested substitution provides specified warranty.

- C. Substitution Requests: Submit electronic copy of each request for consideration to the County Project Manager. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: See form at end of this Section.
 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified material or product cannot be provided.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- D. Project Manager/Engineer's Action: If necessary, Project Manager/Engineer will request additional information or documentation for evaluation within 10 days of receipt of a request for substitution. Project Manager/Engineer will notify Contractor of acceptance or rejection of proposed substitution within 10 days of receipt of request, or 5 days of receipt of additional information or documentation, whichever is later.
1. Form of Acceptance: Change Order.
 2. Use product specified if Project Manager/Engineer cannot make a decision on use of a proposed substitution within time allocated.

PART 3 - EXECUTION (Not Used)

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**ATTACHMENT
SUBSTITUTION REQUEST FORM**

TO: IESZIC FORMELLER, PARK PROJECT MANAGER
PROJECT: LAKESIDE EQUESTRIAN FACILITY

SPECIFIED ITEM: _____
 Section Page Paragraph Description

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the requests; applicable portions of the data are clearly identified.

Attached data also includes description of changes to Contract Documents, which proposed substitution would require for proper installation.

The undersigned states that the following paragraphs, unless modified on attachments, are correct:

1. The proposed substitution does not affect dimensions shown on Drawings.
2. The undersigned will pay for changes to the building design, including engineering design,
3. The proposed substitution will have no adverse affect on other work, directly related, or other- wise, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

SUBMITTED BY:

Signature: _____

Firm: _____

Address: _____

Telephone: _____

FOR USE BY PROJECT MANAGER:

☐ Accepted ☐ Accepted as noted

☐ Not Accepted ☐ Received too late

By: _____

Date: _____

Remarks: _____

Attachments:

- Related Part 5 detailed comparison documentation identifying the differences between this substitution submittal and the detailed requirements within the related specification.

END OF SECTION

SECTION 01 70 00

EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.
- B. RELATED SECTION: Section 02 21 00 - Surveying

1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of products.
 - 4. Progress cleaning.
 - 5. Starting and adjusting.
 - 6. Protection of installed construction.
 - 7. Correction of the Work.
- B. Related Sections include the following:
 - 1. Division 1 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
 - 2. Division 1 Section "Submittal Procedures" for submitting surveys.
 - 3. Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 SUBMITTALS

- A. Qualification Data: For land surveyor or professional engineer.
- B. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.
- C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

- D. Final Property Survey: Submit one electronic copy showing the Work performed and record survey data.

1.4 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
 - 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

4. Examine surfaces for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for interpretation to Project Manager/Engineer. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the construction and grading plans & notes. If discrepancies are discovered, notify Project Manager/Engineer promptly.
- B. General: Engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.
 1. Establish control points to set lines as needed to locate each element of Project.
 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 3. Inform installers of lines which they must comply.
 4. Check the location, level and plumb, of every major element as the Work progresses.
 5. Notify Project Manager/Engineer when deviations from required lines exceed allowable tolerances.
 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

- D. Structure Lines and Levels: Locate and lay out control lines and levels for structures, paving, including those required for electrical work. Transfer survey markings and elevations for use with control lines and levels.
- E. Record Log: Maintain a log of layout control work. Record 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. Make the log available for reference by Project Manager/Engineer.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing control points, and similar reference points before beginning the Work. Preserve and protect control points during construction operations.
 - 1. Do not change or relocate control points without prior written approval of Project Manager/Engineer. Report lost or destroyed control points promptly. Report the need to relocate control points to Project Manager/Engineer before proceeding.
 - 2. Replace lost or destroyed control points promptly. Base replacements on the original survey control points.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Project Manager/Engineer.
 2. Allow for movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully off-site.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

- G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted. All waste and debris shall be lawfully disposed of off-site at no additional cost to the Owner.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching." Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
 - E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.
- 3.10 PAYMENT: See Section 02 21 00 for payment of examination, preparation, construction layout, field engineering, installation, progress cleaning, starting and adjusting, protection of installed construction, and correction of the work which are components of this Section.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Warranties.
 - 3. Final cleaning.
- B. Related Sections include the following:
 - 1. Division 1 Section "Execution Requirements" for progress cleaning of Project site.
 - 2. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 3. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 4. Divisions 2 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 4. Prepare and submit Project Record Documents according to Section 01 78 10, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.

5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 6. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 7. Complete startup testing of systems.
 8. Submit test/adjust/balance records.
 9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 10. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 11. Complete final cleaning requirements, including touchup painting.
 12. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Project Manager/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Project Manager/Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Project Manager/Engineer, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to general provisions of the Contract.
 2. Submit certified copy of the Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Project Manager/Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Project Manager/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Project Manager/Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit one electronic copy of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order.
 - 2. Organize items applying to each space by major element, including categories for hardscape, irrigation, landscape, structures, electrical & plumbing.
 - 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Project Manager/Engineer and Architect.
 - d. Name of Contractor.
 - e. Page number.

1.6 WARRANTIES

- A. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper. Provide two (2) complete sets of printed & bound warranties and bonds.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tabs to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the types or printed title "WARRANTIES," Project name, and name of Contractor.
 - 4. In addition to printed & bound copies, provide a single electronic PDF file combining warranties and bonds. Organize the information in the electronic file in a manner consistent with the construction documents. Provide a table of contents at the beginning of the file with page numbers corresponding to page numbers on individual pages. Identify the electronic file by naming it "WARRANTIES," Project name, and name of Contractor.
- B. Provide additional copies, printed and electronic, of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site in areas disturbed by construction activities, including landscape areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances or markings. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - f. Remove labels that are not permanent.
 - g. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - h. Wipe surfaces of electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - i. Replace parts subject to unusual operating conditions.
 - j. Clean plumbing fixtures (kitchen equipment, drinking fountains, etc.) to a sanitary condition, free of stains, including stains resulting from water exposure.
 - k. Clean light fixtures, if present, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - l. Leave Project clean and ready for occupancy.

- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

Payment: The contract unit prices paid for work shall include full compensation for furnishing all labor, materials, tools, equipment, delivery and incidentals as identified on the drawings and in these technical specifications, complete, in-place and doing all the work involved and providing any specialty tools as required, and no additional compensation will be allowed therefore.

END OF SECTION

SECTION 01 78 10

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Record Operations & Maintenance Manuals.
- B. Related Sections include the following:
 - 1. Division 1 Section "Closeout Procedures" for general closeout procedures.
 - 2. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Divisions 2 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.3 SUBMITTALS

- A. Record Drawings (also known as "As-Builts"): Comply with the following:
 - 1. Number of Copies: Submit three (3) printed, full-size sets and one full-size digital, color copy in PDF format of marked-up Record Prints.
- B. Record Specifications: Submit one electronic copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit two (2) printed & bound copies and one electronic copy of each Product Data submittal.
 - 1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of black-line white prints of the Contract Drawings and Shop Drawings.
 - 1. Preparation: Mark Record Prints 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 prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed or buried elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Revisions to electrical circuitry.
 - f. Actual equipment locations.
 - g. Changes made by Change Order or Construction Change Directive.
 - h. Changes made following Project Manager/Engineer's written orders.
 - i. Details not on the original Contract Drawings.
 - j. Field records for variable and concealed or buried conditions.
 - k. Record information on the Work that is shown only schematically.
 - 3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
 - 4. Mark record sets with legible, erasable, red-colored pencil. 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 Drawings.
 - 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. 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 full-size manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Identification: As follows:

- a. Project name.
- b. Date.
- c. Designation "PROJECT RECORD DRAWINGS."
- d. Name of Project Manager/Engineer and Architect.
- e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications 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.
 - 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 and Record Drawings where applicable.

2.3 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.

2.4 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.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. **Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.**

- B.** Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Project Manager/Engineer's reference during normal working hours.

Payment: The contract unit prices paid for work shall include full compensation for furnishing all labor, materials, tools, equipment, delivery and incidentals as identified on the drawings and in these technical specifications, complete, in-place and doing all the work involved and providing any specialty tools as required, and no additional compensation will be allowed therefore.

END OF SECTION

SECTION 01 78 20

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Standard Specifications, Additions and Modifications of the Standard Specifications, County of San Diego Special Provisions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation manuals for systems, and equipment.
 - 2. Maintenance manuals for the care and maintenance of products, materials, finishes, systems and equipment.
- B. Related Sections include the following:
 - 1. Division 1 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Division 1 Section "Closeout Procedures" for submitting operation and maintenance manuals.
 - 3. Division 1 Section "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
 - 4. Divisions 2 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

1.4 SUBMITTALS

- A. Initial Submittal: Submit two (2) draft printed & bound copies and one draft electronic copy of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Project Manager/Engineer will return one electronic copy of draft and mark whether general scope and content of manual are acceptable.

- B. Final Submittal: Submit two (2) printed & bound copies and one electronic copy of each manual in final form at least 15 days before final inspection. Project Manager/Engineer will return one electronic copy with comments within 15 days after final inspection.
 - 1. Correct or modify each manual to comply with Project Manager/Engineer's comments. Submit one printed & bound copy and one electronic copy of each corrected manual within 15 days of receipt of Project Manager/Engineer's comments.

1.5 COORDINATION

- A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 MANUALS, GENERAL

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Enclose title page in transparent plastic sleeve in printed copy. Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name, address, and telephone number of Contractor.
 - 6. Name and address of Project Manager/Engineer and Architect.
 - 7. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of management size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems,

equipment, and components of one system into a single printed binder and single electronic file.

1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes/compact discs for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 1. System, and equipment descriptions.
 2. Operating standards.
 3. Operating procedures.
 4. Operating logs.
 5. Wiring diagrams.
 6. Control diagrams.
 7. Precautions against improper use.
 8. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
 1. Product name and model number.
 2. Manufacturer's name.

3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.3 PRODUCT MAINTENANCE MANUAL

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.

4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds. Include procedures to follow and required notifications for warranty claims.

2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. Content: For each system, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video, if available.

- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

- D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.
- E. Comply with Division 1 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

Payment: The contract unit prices paid for work shall include full compensation for furnishing all labor, materials, tools, equipment, delivery and incidentals as identified on the drawings and in these technical specifications, complete, in-place and doing all the work involved and providing any specialty tools as required, and no additional compensation will be allowed therefore.

END OF SECTION

SECTION 02 21 00

SURVEYING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Survey for the project including demolition, proposed construction In accordance with the documents. **Refer to Section 01 70 00 which compliments this Section on the Surveying topic.**

1.2 RELATED SECTIONS

- A. Drawings and provisions of the Contract including General and Supplementary Conditions and other Division 1 Specifications Sections apply to the section as if repeated herein.
 - Section 01 70 00 Execution Requirements
 - Section 02 41 00 Demolition

1.3 QUALITY ASSURANCE

- A. Contractor Qualifications: Company specializing in surveying specified in this section, with not less than three years of documented experience. Refer to Section 01 70 00 1.3 & 1.4 for qualification requirements of land surveyor and submittals.

1.4 PRE-SURVEY MEETING

- A. Convene one week before starting work of this section. Review the scope of work and required coordination with the Owner.
- B. The County can provide the Contractor a two-dimensional digital file of the project site plan in AutoCAD format for use in surveying. Contractor shall independently verify all survey control prior to use, and immediately notify the Resident Engineer on any discrepancies between the digital files and construction documents, and shall indemnify and hold harmless the County of San Diego and Engineer of work for use of digital files.
- C. Topography including contours and spot grades, as indicated on the grading plan, is based on site specific data only and does not reflect USGS datums.

1.5 PROJECT CONDITIONS

- A. Coordinate with the plans and the Resident Engineer on the locations of the proposed improvements. Locate existing underground utilities per Demolition and Utility Plans. Verify existing underground service utilities to remain identify and protect unless otherwise directed on the plans or specs.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

1. SURVEY STAKING

- Verify the location and extent of the work of this Section to be performed. Contractor shall verify in the field the proposed construction per the digital file as provided by the County per 1.04 B above. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.
- The Contractor shall perform and be responsible for the accuracy of the surveying adequate for construction. Stakes shall be set for curbs, walls, storm drains, structures, edge of concrete, paving, grades, limit of work and other staking as required to accurately locate, grade, and construct the items of the contract. Cut and fill to finished grade, or flow line, shall be indicated on stakes. The Resident Engineer shall approve the surveying and staking prior to construction commencement.
- The Contractor shall preserve construction survey stakes for the duration of their usefulness. If any construction survey stakes are lost or disturbed and need to be replaced, such replacement shall be done by the Contractor.
- All surveying shall be performed by the Contractor and included in the lump sum price per the bid schedule.
- Refer to Section 01 70 00 Part 3 for examination, preparation, construction layout, and field coordination in relation to surveying.

PAYMENT:

Payment for surveying including examination, preparation, construction layout, and field engineering per Section 01 70 00, shall be included in the contract lump sum paid and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in the surveying, and no additional compensation will be allow therefore.

END OF SECTION

SECTION 02 41 00

DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes demolition activities within the limits of the work to construct the improvements and other purposes as specified in these Specifications and as shown on the drawings, including but not limited to the following:
 - 1. Permits.
 - 2. Pre-demolition meeting.
 - 3. Identification of utilities.
 - 4. Protection of existing utilities to remain in place.
 - 5. Saw cutting Asphalt Concrete (AC) and Portland Cement Concrete (PCC) pavement.
 - 6. Demolition of AC and PCC pavement and site elements.
 - 7. Demolition of miscellaneous site improvements.
 - 8. Demolition of miscellaneous structures.
 - 9. Vegetation and tree stump removal.
 - 10. Salvage.
 - 11. Disposal of materials and debris.
 - 12. Backfilling voids left by removals.
 - 13. Clean up.

1.2 REFERENCE STANDARDS

- A. All references made within these technical provisions to the various standards shown in Section 1.2.B shall be limited to construction materials, methods, and all work incidental to the item of work only. Measurements and Payments shall be established as shown within Part 3 and 4 of these technical provisions only.
 - 1. The following is a list of standards which may be referenced in this Section: American National Standards Institute (ANSI): A10.6, Safety Requirements for Demolition Operations.
 - 2. Occupational Safety and Health Administration (OSHA) 29 CFR 1926 Safety and Health Regulations for Construction
 - 3. Standard Specifications for Public Works Construction the "Greenbook" Standard Specifications, 2018 Edition.

1.3 DEFINITIONS

- A. Debris: All materials generated as part of demolition activities or designated for removal as part of Site cleanup activities.
- B. ACM: Asbestos-containing material.
- C. ACP: Asbestos Cement Pipe

- D. Demolition: Dismantling, razing, destroying, or wrecking of any fixed building, structure, surface or subsurface feature, site element, or any part thereof.
- E. Remove: Detach items from existing construction and legally dispose of them in accordance with Section 017419 unless indicated to be removed and salvaged or removed and reinstalled.
- F. Existing to Remain: Existing items of construction that are not to be removed, and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- G. Modify: Provide all necessary material and labor to modify an existing item to the condition indicated or specified.
- H. Salvage/Salvageable: Remove and deliver, to the specified location(s), the equipment, building materials, or other items so identified to be saved from destruction, damage, or waste, such property to remain that of the Authority Unless otherwise specified, title to items identified for demolition shall revert to Contractor.

1.4 SUBMITTALS

- A. Demolition Plan and Schedule: Contractor shall submit a Demolition Plan and Schedule, see paragraph 1.7 B.
- B. Existing Conditions: Contractor shall provide documentation of existing items, adjoining construction, and site improvements, actual locations of capped conduits and equipment abandoned in place that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs or video which shall be submitted electronically.
 - 2. Include plans and notations to indicate damage.
 - 3. Submit photographs of locations where excavation or boulder removal is to occur.
- C. Permits: Contractor shall obtain and submit copies of special permits and licenses including description of proposed haul routes prior to demolition, hauling, and debris disposal and provide notices for record purposes required for performance and completion of the demolition and removal work, hauling, and disposal of debris.
- D. Contractor's Phasing Plan and Traffic Control Plan: Contractor shall submit a phasing plan showing traffic flow and construction progress that minimizes operational impacts of this project during construction.
- E. Disposal of Construction Material at a Landfill: The Contractor may be required to dispose construction material at a landfill site for proper disposal of construction material. Contractor shall submit all required paperwork to the County Project Manager indicating such disposal. No separate payment will be made for this work.
- F. Disposal Records: Records shall be submitted to the County Project Manager.

1.5 QUALITY CONTROL

- A. Regulatory Requirements: Contractor shall comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Contractor shall protect the demolition excavations, and the safety of workers and the public, in conformance with the requirements of Occupational Safety and Health

Administration (OSHA), particularly "Subpart P - Excavations ' of 29 CFR 1926.

- C. When special inspections are required under the California Building Code, including Chapters 17 and 17A, Contractor shall retain a third-party inspector and ensure that inspections and verifications are performed. No additional payment shall be made for this work.
- D. The Contractor and all Subcontractors who perform specialized demolition activities must be properly licensed to perform the demolition work of this Contract.
- E. The contractor shall submit copies of the required licenses to the County Project Manager.
- F. During times that the Work is performed, the Contractor is responsible to have at least one fully competent and experienced General Superintendent at the Site to represent the Contractor in all matters.
- G. All ground-disturbing activities shall require a qualified monitor(s), retained by the County, on-site at that time. Refer to bid book section IV for requirements.

1.6 PROJECT CONDITIONS

- A. Any existing site improvements (not indicated on the plans to be removed) that are damaged during demolition shall be restored (at the expense of the Contractor) to their original conditions, as acceptable to County Project Manager per Section 1C-3.13.
- B. Contractor shall remove all existing site improvements indicated on plans.
- C. Contractor shall remove or abandon all existing utilities indicated on plans.
- D. Contractor shall restore and clean-up site once site demolition operations are completed.
- E. Contractor shall comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the General Conditions, Contractor's safety requirements shall conform to ANSI A10.6.
- F. Contractor shall conduct demolition to minimize interference with adjacent and occupied building areas.
- G. Contractor shall schedule and minimize interference with other construction activities and contractors during demolition activities.
- H. Ambient Conditions: Contractor shall not perform demolition activities when either weather conditions are such, in the opinion of the County Project Manager, that the work cannot be performed satisfactorily.
- I. Existing Conditions: The Contractor assumes the risks attending to the presence or proximity, if any, of overhead or underground public utility and private lines, pipes, conduits and their associated support work, and other structures and property of every kind and description, in or over the excavation, or in the vicinity of the work, whether above or below the surface of the ground.

1.7 PRE-DEMOLITION MEETING

- A. Pre-Demolition Meeting: Prior to the beginning of demolition activities, the Contractor shall hold a mandatory pre-demolition conference at the site and make arrangements for attendance of the: County Project Manager, representatives of the County, County-retained monitors, Contractor and his subcontractors. The purpose of this meeting is to review methods and procedures related to demolition including, but not limited to the

following:

1. Review and finalize the demolition schedule, and verify the availability of materials, demolition personnel, equipment, and facilities needed to complete the demolition and avoid delays.
2. Review requirements of the work performed by other trades.
3. Review areas where existing construction is to remain and requiring protection.
4. Safety requirements pertaining to this project to ensure safe passage of persons around the area of demolition.
5. Special soil handling requirements.
6. Review Contractor Demolition Plan and Schedule.

B. Demolition Plan and Schedule

1. Contractor shall prepare a Demolition Plan and Schedule that includes the following information:
 - a. A detailed sequence for demolition and removal work that includes starting and ending dates for each activity.
 - b. Coordination activities for the shutoff, capping, and continuation of utility services.
 - c. Means for protecting items to remain.
 - d. Contractor shall submit the required Demolition Plan and Schedule to the County Project Manager seven (7) days prior to the pre-demolition conference for approval.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 GENERAL

- A. Contractor shall review the site and examine the Drawings and Specifications to determine the extent of the Work before beginning any demolition.
- B. Contractor shall inventory and record the condition of items to be removed and reinstalled, and items to be removed and/or salvaged.
- C. Contractor will obtain all permits required by the County of San Diego and with other appropriate government agencies and pay necessary fees.
- D. Contractor shall perform demolition and removal work in accordance with applicable rules of the jurisdictional authorities.
- E. Contractor shall locate existing exposed and buried active utilities, and determine the requirements for their protection, or their disposition with respect to the demolition work.
- F. Contractor shall demolish, remove existing facilities, employ methods required to complete the removals, abandon and/or salvage as indicated on the drawings.
- G. Contractor shall neatly sawcut and remove adjacent pavements in accordance with the Contract drawings using cutting methods least likely to damage facilities to remain.
- H. Contractor shall fill all holes from the demolition process and backfill with appropriate materials. See Paragraph 3.14.

- I. Blasting and burning shall not be permitted.

3.2 PROTECTION OF UTILITIES

- A. Contractor shall obtain markings by the affected utility companies identifying underground utilities and their locations 72 hours prior to performing any excavation or other work close to any underground utility or structure. Contractor shall notify the utility owners before performing any such excavation work and shall call DigAlert at 811. For utility companies not covered by DigAlert, the contractor shall contact the owners directly. Contractor shall keep markings of utilities current as construction progresses in accordance with the requirements of DigAlert and specific utility owners.
- B. Contractor shall scan the work area using a metal detector of adequate strength prior to any excavation. Contractor shall be responsible for locating, protecting, and documenting on Record Drawings, all manholes, water valves, utility access frames and covers or other metal appurtenances buried below the existing surface whether shown on the plans or not. Contractor shall notify County Project Manager immediately of any existing utility found that is not shown on the plans.
- C. Contractor shall maintain and protect from damage all in place existing utilities: water mains, sewers, storm drains, dry utilities, meters, valve covers, fire hydrants, telephone and power poles, and other existing utilities and structures, unless specifically called out for demolition or removal on the plans.
- D. If utility is damaged by Contractor activities, the contractor shall immediately notify the utility owner and County Project Manager for corrective action. This notification shall apply to above-grade, at-grade, and below-grade utilities. The Contractor will be responsible for costs for repair and/or replacement.
- E. All costs for the items listed in this paragraph 3.2 are considered incidental and shall be considered as included in the unit prices for other items of work and no additional payment will be made therefor, unless the referenced item is covered by other specifications.

3.3 PRESERVATION OF REFERENCE MARKERS

- A. Contractor shall not remove, relocate, or disturb survey markers and monuments found within the demolition area without prior written approval of the jurisdictional authorities or the written acceptance of the County Project Manager.
- B. Contractor shall record the locations and designation of survey markers and monuments prior to their removal, provide three reference points for each survey marker and monument to be removed and provide the services of a licensed land surveyor currently registered in the State of California.
- C. Contractor shall store removed markers and monuments during demolition work, and replace them upon completion of the work, re-establish the survey markers and monuments in conformance with the recorded reference points and to the original level of survey accuracy.
- D. All costs for the items listed in this paragraph 3.3 are considered incidental and shall be considered as included in the unit prices for other items of work and no additional payment will be made therefor, unless the referenced item is covered by other specifications.

3.4 NOISE AND DUST ABATEMENT

- A. Contractor shall provide continuous noise and dust abatement as required to prevent disturbance and nuisance to the public and workers, and the occupants of adjacent premises and surrounding areas. Contractor shall dampen or cover areas affected by demolition operations as necessary to prevent dust nuisance.
- B. Contractor shall sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to vehicular traffic.
- D. Contractor shall control fugitive dust by applying an adequate dust palliative, such as water, to the ground and debris in an amount sufficient to maintain dust as incidental to demolition and clearing operations in accordance with the requirements of authorities having jurisdiction.
- E. Before beginning to excavate, Contractor shall place temporary erosion and sediment controls around proposed excavations to eliminate erosion and sedimentation problems.
- F. All costs for the items listed in this paragraph 3.4 are considered incidental and shall be considered as included in the unit prices for other items of work and no additional payment will be made therefor, unless the referenced item is covered by other specifications.

3.5 BRACING, SHORING AND LATERAL SUPPORTS

- A. Contractor shall provide and secure bracing, shoring, or lateral supports to shore unstable trenches and areas created as a result of demolition work.
- B. All costs for the items listed in this paragraph 3.5 are considered incidental and shall be considered as included in the unit prices for other items of work and no additional payment will be made therefor, unless the referenced item is covered by other specifications.

3.6 PROTECTION OF SITE

- A. Traffic Control Signs: Where pedestrian and driver safety is endangered in the area of removal Work, use traffic barricades with flashing lights.
- B. Existing Work:
 - 1. Survey the site and examine the Drawings and Specifications to determine the extent of the Work before beginning any demolition or renovation.
 - 2. Take necessary precautions to avoid damage to existing items scheduled to remain in place, to be reused, or to remain the property of the County; any Contractor-damaged items shall be repaired or replaced as directed by County Project Manager.
 - 3. Do not overload pavements to remain.
 - 4. Do not overload already stabilized areas until the County Project Manager agrees that it is acceptable to do so.
- C. Protection of Personnel:
 - 1. During demolition continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site.
 - 2. Provide temporary barricades and other forms of protection to protect County Project Manager's personnel and the general public from injury due to demolition Work.
 - 3. Provide protective measures as required to provide free and safe passage of County personnel and the general public to occupied portions of the site.

3.7 SAWCUT AND REMOVAL OF EXISTING AC AND PCC PAVEMENT AND SITE IMPROVEMENTS

- A. Care shall be taken in removing the pavement such that damage does not occur to the existing pavement which is to remain in place and that all removals are accomplished by making a neat vertical full depth saw cut at the boundaries of the area to be removed. Where necessary to prevent damage to pavement that is to remain, additional saw cutting within the removed pavement and parallel to the removal boundaries shall be performed. Adjacent materials designated to remain that are damaged by the Contractor due to his operations, including saw cuts, shall be replaced at no additional cost to the County and to the satisfaction of the County Project Manager.
- B. Sawcut existing AC pavement per Section 300-1.3.2.a "Bituminous Pavement" of the "Greenback" Standard Specifications and these special provisions. Sawcut existing PCC pavement per Section 300-1.3.2.b "Concrete Pavement" of the "Greenback" Standard Specifications and by these special provisions.
- C. Sawcut existing PCC curbs, gutters, walks, and median hardscape per Section 300-1.3.2.c "Concrete Curb, Walk, Gutters, Cross Gutters, Driveways, and Alley Intersections" of the "Greenbook" Standard Specifications and these special provisions.
- D. Provide neat saw cuts at locations shown on plans and all limits of PCC and AC removals.
- E. All costs for saw cutting are considered incidental and shall be considered as included in the unit prices for other items of work and no additional payment will be made therefor, unless the referenced item is covered by other specifications.
- F. Remove existing PCC curb, and all other AC or PCC site improvements as indicated on the plans. Contractor shall fully remove and dispose of Miscellaneous Concrete Structures as called out on the plans. All materials to be removed shall be directly taken *off* site to an acceptable receiving site and shall become property of the Contractor. Contractor shall include all costs for all handling, hauling off-site, hauling on-site, disposing, pulverizing, crushing, or blending in the contract unit price for each associated pay item.
- G. Remove and dispose of existing AC pavement. The areas and approximate thickness of pavement to be removed are indicated on the drawings. The Contractor shall load, haul off-site and dispose all removed AC pavement. Material hauled off-site shall become the property of the contractor and shall be handled accordingly. Contractor shall include all costs for this work in the contract unit price for the removal of AC pavement.
- H. Remove and dispose of existing PCC pavement. The areas and approximate thickness of pavement to be removed are indicated on the drawings. The Contractor shall load, haul off-site and dispose all removed PCC pavement. Material hauled off-site shall become the property of the contractor and shall be handled accordingly. Contractor shall include all costs for this work in the contract unit price for the removal of PCC pavement.

3.8 SALVAGE

- A. Items to be salvaged or materials and equipment to be reused are indicated in the drawings.
 - 1. Contractor shall protect the finish of salvaged items during removal, transport, storage, and re-installation and repair or replace salvaged items which are

damaged or destroyed.

- B. The cost to transport salvaged items shall be included in the cost of those items.

3.9 DISPOSAL OF MATERIALS

- A. The cost to haul removed items, for either salvage or disposal, shall be included in the cost of those items.

3.10 BACKFILLING VOIDS LEFT BY REMOVALS

- A. All voids left by removals shall be backfilled with properly compacted engineering fill. The cost to place this fill material shall be incidental to the removal item that caused the void.
- B. Where indicated on the drawings or required by the County, the hole shall be backfilled with engineering fill. The cost to place this engineering fill shall be incidental to the removal item that caused the void.

3.11 CLEANUP

- A. After removals and demolitions, Contractor shall clean and grade the area. All excavations and depressions shall be backfilled and graded to drain. There shall be no debris, rubble, or litter left at the site from any of the demolition operations and the site shall be clean. Debris and rubbish shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.
- B. Contractor shall repair existing surfaces damaged during work, by cleaning and restoring to match original condition.
- C. All costs for the items listed in this paragraph are considered incidental and shall be considered as included in the unit prices for other items of work and no additional payment will be made therefor, unless the referenced item is covered by other specifications.

PART 4 - PAYMENT

- A. The contract's lump sum price paid for all demolition, salvage and protection activities shall include full compensation for furnishing all labor, materials, equipment, tools and incidentals and for performing all the work complete and accepted in place as shown on the drawings and as specified in these special provisions. No additional payment will be made therefor.

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. Reinforcing steel for cast-in-place concrete foundations.
- B. Supports and accessories for steel reinforcement.

1.02 RELATED WORK:

- A. Section 03 30 00 – Cast-in-Place Concrete.

1.03 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 REINFORCEMENT:

- A. Reinforcing Steel: ASTM A 615/A 615M Grade 60 for #7 and smaller bars.
 - 1. Deformed billet-steel bars.
 - 2. Unfinished.

2.02 FABRICATION:

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice, ACI SP-66 - ACI Detailing Manual, ACI 318, and ACI 301.
- B. Welding of reinforcement is permitted only where indicated on drawings. Perform welding in accordance with AWS D1.4.
- C. Mechanical couplers may be substituted for contact lap splices as permitted on drawings.
- D. Locate reinforcing splices not indicated on drawings at point of minimum stress.

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1. Stagger splice locations so that no more than 50% of the bars are spliced at a section.
2. Locations of splices subject to approval by Designer of Record.

PART 3 – EXECUTION

3.01 PLACEMENT:

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position by more than the tolerances set forth in ACI 301.
- B. Do not displace or damage vapor barrier and water proofing membrane.
- C. Accommodate placement of formed openings.
- D. Maintain concrete cover around reinforcing as indicated on drawings.
- E. Conform to applicable code for concrete cover over reinforcement.
- F. Clean reinforcement of loose rust and mill scale, oil, grease, earth, ice, and other materials, which reduce or destroy bond with concrete.
- G. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- H. Welding:
 1. Welding of crossing bars is not permitted.
 2. Protect adjacent reinforcement against arc strikes during welding.
- I. Do not bend or realign reinforcement after being embedded in hardened concrete.

3.02 FIELD QUALITY CONTROL:

- A. Notify Designer of Record before placement of concrete to inspect installed reinforcement for conformance to contract documents before concrete placement.
- B. Visually Inspect 100 percent of mechanical coupler installations.
- C. Inspect placement, location, splices, spacing, size, cover and type of reinforcement for conformance with the contract documents.
- D. Visually inspect placement of flat slab shear reinforcing for conformance with the contract documents and manufacturer recommendations.

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END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. This section specifies cast-in-place foundation concrete and materials and mixes for other concrete.
- B. Controlled Low Strength Fill (indicated as CDF on the drawings) placed as fill is also part of this section.

1.02 RELATED WORK:

- A. Materials testing and inspection during construction: Section 01 45 29, Testing Laboratory Services.
- B. Concrete exterior site work: Section 32 05 23, Concrete for Exterior Improvements.

1.03 TESTING AGENCY FOR CONCRETE MIX DESIGN:

- A. Testing agency retained and reimbursed by the Contractor and approved by Resident Engineer.
- B. Testing agency maintaining active participation in Program of Cement and Concrete Reference Laboratory (CCRL) of National Institute of Standards and Technology
- C. Testing agency shall furnish equipment and qualified technicians to establish proportions of ingredients for concrete mixes.

1.04 TOLERANCES:

- A. Formwork: ACI 117, except the elevation tolerance of formed surfaces before removal of shores is +0 inch and -3/4 inch.
- B. Cross-Sectional Dimension: ACI 117, except tolerance for thickness of slabs 12 inches or less is +3/4 inch and -1/4-inch Tolerance of thickness of beams more than 12 inch but less than 3 feet is +3/4 inch and -3/8 inch.

1.05 REGULATORY REQUIREMENTS:

- A. ACI SP-66 – ACI Detailing Manual.
- B. ACI 318 - Building Code Requirements for Reinforced Concrete.

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- C. ACI 301 – Standard Specifications for Structural Concrete.

1.06 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. Shop Drawings: Reinforcing steel: Complete shop drawings
- C. Mill Test Reports:
1. Reinforcing Steel.
- D. Testing Agency for Concrete Mix Design: Approval request including qualifications of principals and technicians and evidence of active participation in program of Cement and Concrete Reference Laboratory (CCRL) of National Institute of Standards and Technology.
- E. Test Report for Concrete Mix Designs: Trial mixes including water-cement, fly ash, ratio curves, concrete mix ingredients, and admixtures.

1.07 DELIVERY, STORAGE, AND HANDLING:

- A. Conform to ACI 304. Store aggregate separately for each kind or grade, to prevent segregation of sizes and avoid inclusion of dirt and other materials.
- B. Deliver cement in original sealed containers bearing name of brand and manufacturer and marked with net weight of contents. Store in suitable watertight building in which floor is raised at least 300 mm (1 foot) above ground. Store bulk cement, and fly ash, in separate suitable bins.
- C. Deliver other packaged materials for use in concrete in original sealed containers, plainly marked with manufacturer's name and brand, and protect from damage until used.

1.08 REFERENCES:

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Concrete Institute (ACI):
- 117-10Tolerances for Concrete Construction and Materials
- 214R-02Evaluation of Strength Test Results of Concrete
- 301-10Structural Concrete

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304R-00(R2009)Guide for Measuring, Mixing, Transporting, and Placing Concrete
305R-10	.....Hot Weather Concreting
308R-01(R2008)	.....Standard Practice for Curing Concrete
309R-05	.....Guide for Consolidation of Concrete
318-08	.....Building Code Requirements for Reinforced Concrete and Commentary
347-04	.....Guide to Formwork for Concrete
SP-66-04	.....ACI Detailing Manual

C. American Society for Testing and Materials (ASTM):

A82/A82M-07	.....Steel Wire, Plain, for Concrete Reinforcement
A185/185M-07	.....Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
A615/A615M-09	.....Deformed and Plain Billet-Steel Bars
A653/A653M-09	.....Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy- Coated (Galvannealed) by the Hot-Dip Process
A706/A706M-09	.....Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
A820-06	.....Steel Fibers for Fiber-Reinforced Concrete
C31/C31M-09	.....Making and Curing Concrete Test Specimens in the field
C33-08	.....Concrete Aggregates
C39/C39M-09	.....Compressive Strength of Cylindrical Concrete Specimens
C94/C94M-09	.....Ready-Mixed Concrete
C143/C143M-10Slump of Hydraulic Cement Concrete
C150-09Portland Cement
C171-07Sheet Materials for Curing Concrete

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- C172-08Sampling Freshly Mixed Concrete
- C173-10...Air Content of Freshly Mixed Concrete by the
Volumetric Method
- C260-06Air-Entraining Admixtures for Concrete
- C309-07Liquid Membrane-Forming Compounds for Curing
Concrete
- C330-09Lightweight Aggregates for Structural Concrete
- C494/C494M-10Chemical Admixtures for Concrete
- C618-08Coal Fly Ash and Raw or Calcined Natural Pozzolan
for Use as a Mineral Admixture in Concrete

D. Concrete Reinforcing Steel Institute (CRSI): Handbook 2008

1.09 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS:

2.01 CONCRETE MIXES:

- A. Mix Designs: Proportioned in accordance with Section 5.3, "Proportioning on the Basis of Field Experience and/or Trial Mixtures" of ACI 318.
1. If trial mixes are used, make a set of at least 6 cylinders in accordance with ASTM C192 for test purposes from each trial mix; test three for compressive strength at 7 days and three at 28 days.
 2. Submit a report of results of each test series, include a detailed listing of the proportions of trial mix or mixes, including cement, fly ash, admixtures, weight of fine and coarse aggregate per m³ (cubic yard) measured dry rodded and damp loose, specific gravity, fineness modulus, percentage of moisture, air content, water-cement, fly ash , ratio, and consistency of each cylinder in terms of slump.
 3. Prepare a curve showing relationship between water-cement, fly ash ratio at 7-day and 28-day compressive strengths. Plot each curve using at least three specimens.

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4. If the field experience method is used, submit complete standard deviation analysis.
- B. Fly Ash Testing: Submit certificate verifying conformance with specifications initially with mix design and for each truck load of fly ash delivered from source. Notify Resident Engineer immediately when change in source is anticipated. Prior to beginning trial mixes submit to the Resident Engineer the following representative samples of material to be used, properly identified source and project description and number, type of testing (complete chemical and physical), suitably packaged for shipment, and addressed as specified. Allow 60 calendar days for test results after submittal of sample.
1. Fly ash - five pounds.
 2. Portland cement - 8 pounds:
 - a. Address -Waterways Experiment Station (WES)
 - b. 3909 Halls Ferry Road
 - c. Vicksburg, MS 39180-6199
 - d. ATTN: Engineering Materials Group
- C. After approval of mixes no substitution in material or change in proportions of approval mixes may be made without additional tests and approval of Resident Engineer or as specified. Making and testing of preliminary test cylinders may be carried on pending approval of cement and fly ash, providing Contractor and manufacturer certify that ingredients used in making test cylinders are the same. Resident Engineer may allow Contractor to proceed with depositing concrete for certain portions of work, pending final approval of cement and fly ash and approval of design mix.
- D. Cement Factor: Maintain minimum cement factors in Table I regardless of compressive strength developed above minimums. Use Fly Ash as an admixture with 20% replacement by weight in all structural work.

TABLE I - CEMENT AND WATER FACTORS FOR CONCRETE

Concrete Strength		Non-Air-Entrained	Air-Entrained	
Min. 28 Day Comp. Str.	Min. Cement kg/m ³ (lbs/c. yd)	Max. Water Cement Ratio	Min. Cement kg/m ³ (lbs/c. yd)	Max. Water Cement Ratio
MPa (psi)				
35 (5000) ^{1,2}	375 (630)	0.45	385 (650)	0.40
30 (4000) ^{1,2}	325 (550)	0.45	340 (570)	0.40
25 (3000) ^{1,2}	280 (470)	0.50	290 (490)	0.45
25 (3000) ¹	300 (500)	*	310 (520)	*

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1. If trial mixes are used, the proposed mix design shall achieve a compressive strength 1200 psi in excess of f'_c . For concrete strengths above 5000 psi, the proposed mix design shall achieve a compressive strength 1400 psi in excess of f'_c .
 2. For concrete exposed to high sulfate content soils maximum water cement ratio is 0.44.
- E. Maximum Slump: Maximum slump, as determined by ASTM C143 with tolerances as established by ASTM C94, for concrete to be vibrated shall be as shown in Table II.

TABLE II - MAXIMUM SLUMP, MM (INCHES)*

Type of Construction	Normal Weight Concrete	Lightweight Structural Concrete
Reinforced Footings and Substructure Walls	75mm (3 inches)	75 mm (3 inches)
Slabs, Beams, Reinforced Walls, and Building Columns	100 mm (4 inches)	100 mm (4 inches)

- F. Slump may be increased by the use of the approved high-range water-reducing admixture (superplasticizer). Tolerances as established by ASTM C94. Concrete containing the high-range-water-reducing admixture may have a maximum slump of 9 inches. The concrete shall arrive at the job site at a slump of 2 inches to 3 inches. This should be verified, and then the high-range-water-reducing admixture added to increase the slump to the approved level.
- G. Air-Entrainment: Air-entrainment of normal weight concrete shall conform with Table III. Air-entrainment of lightweight structural concrete shall conform with Table IV. Determine air content by either ASTM C173 or ASTM C231.

TABLE III - TOTAL AIR CONTENT FOR
VARIOUS SIZES OF COARSE AGGREGATES
(NORMAL CONCRETE)

Nominal Maximum Size of Total Air Content	Coarse Aggregate, mm (Inches) Percentage by Volume
10 mm (3/8 in).6 to 10	13 mm (1/2 in).5 to 9
20 mm (3/4 in).4 to 8	25 mm (1 in).3-1/2 to 6-1/2

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40 mm (1 1/2 in).3 to 6	
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- H. High early strength concrete, made with Type III cement or Type I cement plus non-corrosive accelerator, shall have a 7-day compressive strength equal to specified minimum 28-day compressive strength for concrete type specified made with standard Portland cement.
- I. Concrete slabs placed at air temperatures below 10 degrees C (50 degrees Fahrenheit) use non-corrosive, non-chloride accelerator. Concrete required to be air entrained use approved air entraining admixture. Pumped concrete, synthetic fiber concrete, architectural concrete, concrete required to be watertight, and concrete with a water/cement ratio below 0.50 use high-range water-reducing admixture (superplasticizer).
- J. Durability: Use air entrainment for exterior exposed concrete subjected to freezing and thawing and other concrete shown or specified. Air content as shown in Table III or Table IV.
 - 1. Enforcing Strength Requirements: Test as specified in Section 01 45 29, Testing Laboratory Services, during the progress of the work. Seven-day tests may be used as indicators of 28-day strength. Average of any three 28-day consecutive strength tests of laboratory-cured specimens representing each type of concrete shall be equal to or greater than specified strength. No single test shall be more than 500 psi below specified strength. Interpret field test results in accordance with ACI 214. Should strengths shown by test specimens fall below required values. Government may require additional testing and engineers review.
 - 2. Require changes in mix proportions by selecting one of the other appropriate trial mixes or changing proportions, including cement content, of approved trial mix.
 - 3. Require additional curing and protection.
 - 4. If five consecutive tests fall below 95 percent of minimum values given in Table I or if test results are so low as to raise a question as to the safety of the structure, Engineer may direct Contractor to take cores from portions of the structure. Use results from cores tested by the Contractor retained testing agency to analyze structure.
 - 5. If strength of core drilled specimens falls below 85 percent of minimum value given in Table I, Engineer may order load tests, made by Contractor retained testing agency, on portions of building so affected. Load tests in accordance with ACI 318 and criteria of acceptability of concrete under test as given therein.
 - 6. Concrete work judged inadequate by structural analysis, by results of load test, or for any reason, shall be reinforced with additional construction or replaced, if directed by the Engineer.

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2.02 BATCHING AND MIXING:

- A. General: Concrete shall be "Ready-Mixed" and comply with ACI 318 and ASTM C94, except as specified. Batch mixing at the site is permitted. Mixing process and equipment must be approved by Resident Engineer. With each batch of concrete, furnish certified delivery tickets listing information in Paragraph 16.1 and 16.2 of ASTM C94. Maximum delivery temperature of concrete is 100 degrees Fahrenheit. Minimum delivery temperature as follows:

Atmospheric Temperature	Minimum Concrete Temperature
-1. degrees to 4.4 degrees C	15.6 degrees C (60 degrees F.)
(30 degrees to 40 degrees F)	
-17 degrees C to -1.1 degrees C (0 degrees to 30 degrees F.)	21 degrees C (70 degrees F.)

1. Services of aggregate manufacturer's representative shall be furnished during the design of trial mixes and as requested by the Resident Engineer for consultation during batching, mixing, and placing operations of lightweight structural concrete. Services will be required until field controls indicate that concrete of required quality is being furnished. Representative shall be thoroughly familiar with the structural lightweight aggregate, adjustment and control of mixes to produce concrete of required quality. Representative shall assist and advise Resident Engineer.

PART 3 – EXECUTION

3.01 FORMWORK:

- A. General: Design in accordance with ACI 347 is the responsibility of the Contractor.
1. Form boards and plywood forms may be reused for contact surfaces of exposed concrete only if thoroughly cleaned, patched, and repaired and Engineer approves their reuse.
 2. Provide forms for concrete footings unless Engineer determines forms are not necessary.
 3. Corrugated fiberboard forms: Place forms on a smooth firm bed, set tight, with no buckled cartons to prevent horizontal displacement, and in a dry condition when concrete is placed.

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B. Treating and Wetting: Treat or wet contact forms as follows:

1. Coat plywood and board forms with non-staining form sealer. In hot weather, cool forms by wetting with cool water just before concrete is placed.
2. Clean and coat removable metal forms with light form oil before reinforcement is placed. In hot weather, cool metal forms by thoroughly wetting with water just before placing concrete.
3. Use sealer on reused plywood forms as specified for new material.

C. Construction Tolerances:

1. Set and maintain concrete formwork to assure erection of completed work within tolerances specified and to accommodate installation of other rough and finish materials. Accomplish remedial work necessary for correcting excessive tolerances. Erected work that exceeds specified tolerance limits shall be remedied or removed and replaced, at no additional cost to the City.
2. Permissible surface irregularities for various classes of materials are defined as "finishes" in specification sections covering individual materials. They are to be distinguished from tolerances specified which are applicable to surface irregularities of structural elements.

3.02 PLACING REINFORCEMENT:

A. General: Details of concrete reinforcement in accordance with ACI 318 unless otherwise shown.

B. Placing: Place reinforcement conforming to CRSI DA4, unless otherwise shown.

1. Place reinforcing bars accurately and tie securely at intersections and splices with 16-gauge black annealed wire. Secure reinforcing bars against displacement during the placing of concrete by spacers, chairs, or other similar supports. Portions of supports, spacers, and chairs in contact with formwork shall be made of plastic in areas that will be exposed when building is occupied. Type, number, and spacing of supports conform to ACI 318. Where concrete slabs are placed on ground, use concrete blocks or other non-corrodible material of proper height, for support of reinforcement. Use of brick or stone supports will not be permitted.
2. Lap welded wire fabric at least 1 1/2 mesh panels plus end extension of wires not less than 12 inches in structural slabs. Lap welded wire fabric at least 1/2 mesh panels plus end extension of wires not less than 6 inches in slabs on grade.

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3. Splice column steel at no points other than at footings and floor levels unless otherwise shown.
- C. Bending: Bend bars cold, unless otherwise approved. Do not field bend bars partially embedded in concrete, except when approved by Resident Engineer.
- D. Cleaning: Metal reinforcement, at time concrete is placed, shall be free from loose flaky rust, mud, oil, or similar coatings that will reduce bond.
- E. Future Bonding: Protect exposed reinforcement bars intended for bonding with future work by wrapping with felt and coating felt with a bituminous compound unless otherwise shown.

3.03 VAPOR BARRIER:

- A. Except where membrane waterproofing is required, interior concrete slab on grade shall be placed on a continuous vapor barrier.
 1. Place 4 inches of fine granular fill over the vapor barrier to act as a blotter for concrete slab.
 2. Vapor barrier joints lapped 6 inches and sealed with compatible waterproof pressure-sensitive tape.
 3. Patch punctures and tears.
 4. 15 mil thickness minimum.

3.04 MOISTURE VAPOR EMISSIONS & ALKALINITY CONTROL SEALER:

- A. Sealer is applied on the day of the concrete pour or as as soon as harsh weather permits, prior to any other chemical treatments for concrete slabs either on grade, below grade or above grade. Apply to all slab on grade, below grade or above grade that are scheduled to receive resilient flooring, such as, sheet vinyl, vinyl composition tile, rubber, wood flooring, carpet, epoxy coatings and overlays.
- B. Manufacturer's representative will be on the site the day of concrete pour to install or train its application and document. He shall return on every application thereafter to verify that proper procedures are followed.
 1. Apply Sealer to concrete slabs as soon as final finishing operations are complete and the concrete has hardened sufficiently to sustain floor traffic without damage.
 2. Spray apply Sealer at the rate of 200 square feet per gallon. Lightly broom product evenly over the substrate and product has completely penetrated the surface.
 3. If within two (2) hours after initial application areas are subjected to heavy rainfall and puddling occurs, reapply Sealer product to these areas as soon as weather condition permits.

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3.05 CONSTRUCTION JOINTS:

- A. Unless otherwise shown, location of construction joints to limit individual placement shall not exceed 80 feet in any horizontal direction, except slabs on grade which shall have construction joints shown. Allow 48 hours to elapse between pouring adjacent sections unless this requirement is waived by Resident Engineer.
- B. Place concrete for columns slowly and in one operation between joints. Install joints in concrete columns at underside of deepest beam or girder framing into column.
- C. Allow 2 hours to elapse after column is cast before concrete of supported beam, girder or slab is placed. Place girders, beams, grade beams, column capitals, brackets, and haunches at the same time as slab unless otherwise shown.

3.06 EXPANSION JOINTS:

- A. Clean expansion joint surfaces before installing premolded filler and placing adjacent concrete.

3.07 PLACING CONCRETE:

- A. Preparation:
 - 1. Remove hardened concrete, wood chips, shavings and other debris from forms.
 - 2. Remove hardened concrete and foreign materials from interior surfaces of mixing and conveying equipment.
 - 3. Have forms and reinforcement inspected and approved by Resident Engineer before depositing concrete.
 - 4. Provide runways for wheeling equipment to convey concrete to point of deposit. Keep equipment on runways which are not supported by or bear on reinforcement. Provide similar runways for protection of vapor barrier on coarse fill.
- B. Bonding: Before depositing new concrete on or against concrete which has been set, thoroughly roughen and clean existing surfaces of laitance, foreign matter, and loose particles.
 - 1. Preparing surface for applied topping:
 - a. Remove laitance, mortar, oil, grease, paint, or other foreign material by sand blasting. Clean with vacuum type equipment to remove sand and other loose material.

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- b. Broom clean and keep base slab wet for at least four hours before topping is applied.
 - c. Use a thin coat of one part Portland cement, 1.5 parts fine sand, bonding admixture; and water at a 50: 50 ratio and mix to achieve the consistency of thick paint. Apply to a damp base slab by scrubbing with a stiff fiber brush. New concrete shall be placed while the bonding grout is still tacky.
- C. Conveying Concrete: Convey concrete from mixer to final place of deposit by a method which will prevent segregation. Method of conveying concrete subject to approval of Resident Engineer.
- D. Placing: For special requirements see Paragraphs, HOT WEATHER and COLD WEATHER.
 - 1. Do not place concrete when weather conditions prevent proper placement and consolidation, or when concrete has attained its initial set, or has contained its water or cement content more than 1 1/2 hours.
 - 2. Deposit concrete in forms as near as practicable in its final position. Prevent splashing of forms or reinforcement with concrete in advance of placing concrete.
 - 3. Do not drop concrete freely more than 10 feet for concrete containing the high-range water-reducing admixture (superplasticizer) or 1500 mm (5 feet) for conventional concrete. Where greater drops are required, use a tremie or flexible spout (canvas elephant trunk), attached to a suitable hopper.
 - 4. Discharge contents of tremies or flexible spouts in horizontal layers not exceeding 20 inches in thickness, and space tremies such as to provide a minimum of lateral movement of concrete.
 - 5. Continuously place concrete until an entire unit between construction joints is placed. Rate and method of placing concrete shall be such that no concrete between construction joints will be deposited upon or against partly set concrete, after it's initial set has taken place, or after 45 minutes of elapsed time during concrete placement.
 - 6. On bottom of members with severe congestion of reinforcement, deposit 1 inch layer of flowing concrete containing the specified high-range water- reducing admixture (superplasticizer). Successive concrete lifts may be a continuation of this concrete or concrete with a conventional slump.
 - 7. Concrete on metal deck:
 - a. Concrete on metal deck shall be thickness shown. Concrete is to be poured so that uniform depth is maintained across slab. Start concrete pours around structural columns and then work pours out across girders and joists.
- E. Consolidation: Conform to ACI 309. Immediately after depositing, spade concrete next to forms, work around reinforcement and into angles of forms,

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tamp lightly by hand, and compact with mechanical vibrator applied directly into concrete at approximately 18 inch intervals. Mechanical vibrator shall be power driven, hand operated type with minimum frequency of 5000 cycles per minute having an intensity sufficient to cause flow or settlement of concrete into place. Vibrate concrete to produce thorough compaction, complete embedment of reinforcement and concrete of uniform and maximum density without segregation of mix. Do not transport concrete in forms by vibration.

1. Use of form vibration shall be approved only when concrete sections are too thin or too inaccessible for use of internal vibration.
2. Carry on vibration continuously with placing of concrete. Do not insert vibrator into concrete that has begun to set.

3.08 HOT WEATHER:

- A. Follow the recommendations of ACI 305 or as specified to prevent problems in the manufacturing, placing, and curing of concrete that can adversely affect the properties and serviceability of the hardened concrete. Methods proposed for cooling materials and arrangements for protecting concrete shall be made in advance of concrete placement and approved by Resident Engineer.

3.09 COLD WEATHER:

- A. Follow the recommendations of ACI 306 or as specified to prevent freezing of concrete and to permit concrete to gain strength properly. Use only the specified non-corrosive, non-chloride accelerator. Do not use calcium chloride, thiocyanates or admixtures containing more than 0.05 percent chloride ions. Methods proposed for heating materials and arrangements for protecting concrete shall be made in advance of concrete placement and approved by Resident Engineer.

3.10 PROTECTION AND CURING:

- A. Conform to ACI 308: Initial curing shall immediately follow the finishing operation. Protect exposed surfaces of concrete from premature drying, wash by rain and running water, wind, mechanical injury, and excessively hot or cold temperatures. Keep concrete not covered with membrane or other curing material continuously wet for at least 7 days after placing, except wet curing period for high-early-strength concrete shall be not less than 3 days. Keep wood forms continuously wet to prevent moisture loss until forms are removed. Cure exposed concrete surfaces as described below. Other curing methods may be used if approved by Resident Engineer.
 1. Liquid curing and sealing compounds: Apply by power-driven spray or roller in accordance with the manufacturer's instructions. Apply

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immediately after finishing. Maximum coverage 400 square feet per gallon) on steel troweled surfaces and 300 square feet per gallon) on floated or broomed surfaces for the curing/sealing compound.

2. Plastic sheets: Apply as soon as concrete has hardened sufficiently to prevent surface damage. Utilize widest practical width sheet and overlap adjacent sheets 2 inches. Tightly seal joints with tape.
3. Paper: Utilize widest practical width paper and overlap adjacent sheets 2 inches. Tightly seal joints with sand, wood planks, pressure-sensitive tape, mastic or glue.

3.11 CONCRETE FINISHES:

A. Slab Finishes:

1. Monitoring and Adjustment: Provide continuous cycle of placement, measurement, evaluation and adjustment of procedures to produce slabs within specified tolerances. Monitor elevations of structural steel in key locations before and after concrete placement to establish typical deflection patterns for the structural steel. Determine elevations of cast-in-place slab soffits prior to removal of shores. Provide information to Resident Engineer and floor consultant for evaluation and recommendations for subsequent placements.
2. Set perimeter forms to serve as screed using either optical or laser instruments. For slabs on grade, wet screeds may be used to establish initial grade during strike-off, unless Resident Engineer determines that the method is proving insufficient to meet required finish tolerances and directs use of rigid screed guides. Where wet screeds are allowed, they shall be placed using grade stakes set by optical or laser instruments. Use rigid screed guides, as opposed to wet screeds, to control strike-off elevation for all types of elevated (non slab-on- grade) slabs. Divide bays into halves or thirds by hard screeds. Adjust as necessary where monitoring of previous placements indicates unshored structural steel deflections to other than a level profile.
3. Place slabs monolithically. Once slab placement commences, complete finishing operations within same day. Slope finished slab to floor drains where they occur, whether shown or not.
4. Use straightedges specifically made for screeding, such as hollow magnesium straightedges or power strike-offs. Do not use pieces of dimensioned lumber. Strike off and screed slab to a true surface at required elevations. Use optical or laser instruments to check concrete finished surface grade after strike-off. Repeat strike-off as necessary. Complete screeding before any excess moisture or bleeding water is present on surface. Do not sprinkle dry cement on the surface.
5. Immediately following screeding, and before any bleed water appears, use a 10-foot wide highway straightedge in a cutting and filling operation to achieve surface flatness. Do not use bull floats or darbys,

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except that darbying may be allowed for narrow slabs and restricted spaces.

6. Wait until water sheen disappears and surface stiffens before proceeding further. Do not perform subsequent operations until concrete will sustain foot pressure with maximum of 1/4 inch indentation.
7. Scratch Finish: Finish base slab to receive a bonded applied cementitious application as indicated above, except that bull floats and darbys may be used. Thoroughly coarse wire broom within two hours after placing to roughen slab surface to insure a permanent bond between base slab and applied materials.
8. Float Finish: Slabs to receive unbonded toppings, steel trowel finish, fill, mortar setting beds, or a built-up roof, and ramps, stair treads, platforms (interior and exterior), and equipment pads shall be floated to a smooth, dense uniform, sandy textured finish. During floating, while surface is still soft, check surface for flatness using a 10 foot highway straightedge. Correct high spots by cutting down and correct low spots by filling in with material of same composition as floor finish. Remove any surface projections and re-float to a uniform texture.
9. Steel Trowel Finish: Concrete surfaces to receive resilient floor covering or carpet, monolithic floor slabs to be exposed to view in finished work, future floor roof slabs, applied toppings, and other interior surfaces for which no other finish is indicated. Steel trowel immediately following floating. During final troweling, tilt steel trowel at a slight angle and exert heavy pressure to compact cement paste and form a dense, smooth surface. Finished surface shall be smooth, free of trowel marks, and uniform in texture and appearance.
10. Broom Finish: Finish exterior slabs, ramps, and stair treads with a bristle brush moistened with clear water after surfaces have been floated. Brush in a direction transverse to main traffic. Match texture approved by Resident Engineer from sample panel.
11. Remedial Measures for Rejected Slabs: Correct rejected slab areas by grinding, planing, surface repair with underlayment compound or repair topping, retopping, or removal and replacement of entire rejected slab areas, as directed by Resident Engineer, until a slab finish constructed within specified tolerances is accepted.

3.12 SURFACE TREATMENTS:

- A. Use on exposed concrete floors and concrete floors to receive carpeting except those specified to receive non-slip finish .
- B. Liquid Densifier/Sealer: Apply in accordance with manufacturer's directions just prior to completion of construction.
- C. Non-Slip Finish: Except where safety nosing and tread coverings are shown, apply non- slip abrasive aggregate to treads and platforms of concrete steps

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and stairs, and to surfaces of exterior concrete ramps and platforms. Broadcast aggregate uniformly over concrete surface at rate of application of 8% per 7.5 percent per square foot of area. Trowel concrete surface to smooth dense finish. After curing, rub treated surface with abrasive brick and water to slightly expose abrasive aggregate

END OF SECTION

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PART 1 – GENERAL

1.01 SUMMARY OF WORK

- A. Work Includes: Precast, prestressed structural concrete components as shown on the Drawings, specified herein, and needed for complete and proper installation, including:
 - 1. Design not shown on the contract drawings
 - 2. Erection drawings and Production drawings
 - 3. Factory Inspection and testing per PCI certification requirements
 - 4. Fabrication of specified precast concrete components,
 - 5. Handling, storage and protection of precast concrete components,
 - 6. Transportation of precast concrete components to erection site,
 - 7. Erection of precast concrete components including all bearing pads, base plates, inserts, clamps, nuts, bolts, and other necessary appurtenances, and other hardware items for connections between cast-in-place concrete and precast components and tolerances for the placement of these components.

1.02 WORK EXCLUDES:

- A. Independent inspection and testing of work
- B. Cast-in-place concrete
- C. Steel reinforcement and embedded items in cast-in-place concrete

1.03 REFERENCES

- A. Precast Concrete Institute
- B. PCI MNL 116-85 Manual for Quality Control For Plants and Production of Precast Prestressed Concrete Products
- C. PCI MNL 120-04 Design Handbook, 6th Edition
- D. American Concrete Institute
- E. ACI 318-05 Building Code Requirements for Reinforced Concrete
- F. American Society of Testing and Materials:
- G. ASTM A 185-94 Steel Welded Wire Fabric, Plain for Concrete Reinforcement

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- H. ASTM A 615-94 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- I. ASTM A 706-92b Low Alloy Steel Deformed Bars for Concrete Reinforcement
- J. ASTM C 33-93 Concrete Aggregates
- K. ASTM C 94-94 Ready Mixed Concrete
- L. ASTM C 150-94 Portland Cement
- M. ASTM C 260-94 Air-Entraining Admixtures for Concrete
- N. ASTM C 330-93 Lightweight Aggregates for Structural Concrete
- O. ASTM C 494-92 Chemical Admixtures for Concrete
- P. ASTM C 618-94a Fly Ash and Raw or Calcified Natural Pozzolan for use as Mineral Admixture in Portland Cement Concrete
- Q. ASTM C 989-93 Ground Granulated Blast Furnace Slag for Use in Concrete and Mortars
- R. ASTM C 1107-97 Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

1.04 SUBMITTALS

- A. The Contractor shall submit design calculations and drawings that are stamped and signed by a California licensed Civil Engineer.
- B. Concrete Mix Design: The manufacturer shall submit sources and proportions of all constituent materials, and mixture characteristics for all designs of Portland cement concrete. Submit manufacturer's laboratory or field data documenting required strength in accordance with ACI 318. Separate design is required for each strength and class of concrete. Data for each mix shall include the following:
 - 1. Mix identification
 - 2. Specified strength
 - 3. Gradation of fine and coarse aggregates and combined gradation.
 - 4. Sources of all constituent materials
 - 5. Proportions of all constituent materials
 - 6. Water/Cement Ratio
 - 7. Design slump (or flow) with tolerance
 - 8. Air content
 - 9. Unit weight

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- C. Concrete Test Reports: Submit test reports of production of precast components. Reports will show 28-day compressive strength tests representing concrete placed in components.
- D. Erection Drawings: Shall be prepared showing:
 - 1. Member piece marks.
 - 2. Plans and/or elevations locating and defining all precast components.
 - 3. Sections and details showing connections, embedded items and their relation to the structure.
 - 4. Joints and openings between members and between members and structure.
 - 5. Description of all loose, embedded and field hardware.
 - 6. Field installed anchor location drawings (if applicable).
 - 7. Shipping and handling requirements.
 - 8. All dead, live and other applicable loads provided by the Engineer of Record and used in the design of the precast components.
 - 9. Expansion joint details (if required)
- E. Production shop drawings: Submit, for record purposes only, drawings and calculations providing the following information: (Only representative/typical details of each element will be provided)
 - 1. Plan and/or elevation view of each component
 - 2. Sections and details to indicate quantities and location of reinforcing steel, anchors, inserts and all embedded items. Catalogue and design data on all inserts, bearing plates, anchors, and embedded items.
 - 3. Lifting and erection devices
 - 4. Dimension and finishes
 - 5. Prestress for strands and concrete strengths
 - 6. Methods for storage and transportation
- F. Samples: Furnish 12 inch by 12-inch samples as required by the Engineer. Upon approval of the samples for finish and color, the Engineer will inspect one full size component at the manufacturer's plant no later than 5 days after manufacturer's request. Provide representative detail such as returns, edges, repairs and finished life point patching or plastic caps. Upon approval of the first run of components, they shall become the identified standard, and may be used in the structure.
- G. Approvals: Erection shall not proceed without approval by the Engineer of Record of the appropriate drawing and design calculations.

1.05 QUALITY ASSURANCE

- A. Manufacturer qualifications
 - 1. The manufacturer shall have a minimum of 5 years proven experience in the design and manufacture of precast concrete and prestressed

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components, and having adequate finances, equipment, plant and skilled personnel to expeditiously design, detail, fabricate and install the work as required by the Drawings and Specifications.

2. The Manufacturer shall be a producer/member of the P.C.I. Plant Certification Program.

B. Engineering qualifications

1. The manufacturer shall show evidence of an in-house engineering department managed by a registered professional engineer.
2. The manufacturer's professional engineer shall hold current professional engineering registration in the state where the components are to be permanently erected. In the event the manufacturer's professional engineer is not registered in the state where the components are to be permanently erected, the manufacturer shall contract with a professional engineer registered in the state where the components are to be permanently erected to perform the required design and engineering work.

- C. Erector qualifications: Shall have been regularly engaged for a period not less than 5 years in the erection of precast components like those required for this project.

1.06 CONCRETE TESTING

- A. Unless otherwise directed by the Engineer, concrete testing shall be performed by the manufacturer in accordance with PCI MNL 116-85. If directed and paid for by the owner, testing shall be performed by an independent testing and inspection agency. If inspection discloses improper workmanship or inferior material, any subsequent inspection or test deemed necessary by the Engineer shall be at no cost to the Owner.
- B. All testing shall be performed by ACI Concrete Field-Testing Technician Grade 1 in accordance with ACI CPI

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Components shall not be shipped until the compressive strength of test specimens representing the component have developed a compressive strength of 80% of the specified compressive strength or until the component can safely support the superimposed dead load of other precast components, whichever is greater.
- B. Precast components shall be lifted and supported during manufacturing and yard handling only at the lifting and supporting points or both, as shown on the shop drawings and with appropriate lifting devices.

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- C. Precast components shall be stored in a manner to minimize cracking, distortion, warping, staining, or other physical damage. Components shall be stored on properly cushioned supports to protect the edges.
- D. Units shall not be placed in contact with earth or other staining influences or to rest on corners.
- E. All holes and reglets shall be protected against water and ice in freezing weather.
- F. Precast components shall be delivered to the project site in such quantities and at such times to assure continuous operations. Components shall be transported with proper equipment, methods and with qualified personnel.

1.08 **WARRANTY**

- A. The Manufacturer shall provide the following warranty:
 - 1. “We (name of Manufacturer or Subcontractor) do, hereby, warrant that the precast units are in accordance with the contract documents and any authorized modification thereto, and will be free of spalls or show evidence of visible cracking beyond accepted industry standards, splitting, deformation, or loosening resulting from inferior materials or workmanship by this trade for a period of one (1) year effective from the date of the substantial completion of the precast erection. Precast units showing such defects will be repaired or replaced and made acceptable at no expense to the Owner.”

1.09 **PAYMENTS**

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 **DESIGN REQUIREMENTS**

- A. General:
 - 1. Precast Components: The manufacturer shall complete the design, including calculations and detailing, for all precast components specified on the Contract Drawings. Design shall be based on preliminary design criteria and conditions provided on the Drawings and in the Specifications. The manufacturer shall perform the complete design assuring that the manufacturing, transportation and erection process are compatible with the Contract Drawings and Specifications.

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2. Erection: The manufacturer's designer shall consider erection of the precast components including calculations and details for guying, staying, and shoring all precast components to assure structural stability during the construction stage and before all permanent structural connections are completed. Provide in the erection plan for removal, replacement, and relocation of guying, bracing, and shoring before all permanent precast structural connections are completed.
3. The manufacturer's registered professional engineer shall retain responsibility for the erection design.
4. Design of precast components and connections shall be prepared under the direct supervision of the manufacturer's professional engineer with approval by the Engineer of Record (EOR).

B. Design Criteria:

1. Design loads:
 - a. All dead and live loads specified on the Contract Drawings
 - b. All other loads specified for components, where applicable
 - c. Initial handling and erection stress limits
 - d. All precast components and connections to non-precast elements shall be designed in accordance with the PCI Design Handbook.
 - e. All precast components shall have a minimum reinforcing in accordance with ACI 318. Analysis of prestressed components shall include a check of the shear reinforcing requirements at 0.1L, 0.2L, 0.25L and 0.3L, where L is the component length.

C. Modifications:

1. All proposed modifications to the drawing and specifications shall be submitted to the Engineer with complete design calculations and drawing.
2. The location of openings shall be shown on the Drawings. Openings shall be located, and field drilled (or cut) by the trade requiring them after precast components have been erected and grouted. Locations of all field cut openings shall be reviewed and approved by the manufacturer prior to drilling or cutting.
3. Lifting devices shall be designed and cast into the components to ensure safe and efficient handling. Lifting devices shall be so arranged that they do not have to be removed; or, if they must be removed, they shall be arranged so that they are readily removed and any planned depressions in the concrete can be readily filled.

- D. Lift loops and erection inserts shall be located so they are not objectionable in the completed structure with a minimum concrete or grout cover as specified in ACI 318 and the PCI Design Handbook. Inserts located in areas exposed to

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view shall be recessed and patched with non-shrink, non-staining grout to match surrounding concrete, or cover and protect in an approved manner.

2.02 MATERIALS

A. Cementitious Materials

1. Portland cement: ASTM C 150, Type I or III
2. Fly Ash: ASTM C 618, Except the L.O.I. shall not exceed 3.0%
3. Ground Granulated Blast Furnace Slag: ASTM C 989
4. Architectural Cement: Cement meeting the requirements of ASTM C 150 or a blend of a cement meeting the requirements of ASTM C 150 and blended with fly ash, ground granulated blast furnace slag and/or silica fume to match the Owner's control sample.

B. Aggregates

1. Normal Weight Aggregates: ASTM C33. Provide aggregates from a single source for architecturally finished concrete. Local aggregates not complying with ASTM C 33, but which have shown by special test or actual service to produce concrete of adequate strength and durability, may be used when acceptable to the Engineer.
2. Lightweight Aggregates: ASTM C 330

C. Admixtures:

1. Air-Entraining Admixture: ASTM C 260
2. Water reducing admixtures: ASTM C 494. Use in strict compliance with manufacturer's directions. Admixtures to increase cement dispersion, or provide increased workability for low slump concrete, may be used subject to Engineer's acceptance. Use amounts as recommended by admixture manufacturer for climatic conditions prevailing at time of placing. Adjust quantities of admixtures as required to maintain quality control.

D. Reinforcing Steel:

1. Billet steel: ASTM A 615, Grade 60K.
2. Low alloy steel reinforcing should conform to ASTM A 706 when welding reinforcement, Grade 60K, for welding.
3. Welded wire mesh shall conform to ASTM A 185, or ASTM A 497, Grade 60K, Plain.
4. Prestressing strand: Shall be uncoated seven (7) wire low relaxation strand ASTM A416, Grade 270K.

E. Anchors and inserts

1. Structural steel shall be of new material conforming to ASTM A 36.

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2. Bolts: ASTM A 307
3. Welded headed studs: AWS D1.1-Type B.
4. Deformed bar anchors: ASTM A496
5. Mechanical splice for future expansion column and wall reinforcing anchorage: Splice Sleeve, Interlock.
6. Rod anchor bars: high strength coil rod, or approved equal
7. Anchor finish:
 - a. Shop primer: Manufacturer's standards.
 - b. Hot dipped galvanized: ASTM A153
 - c. Zinc Rich Coating: Self-curing, one component, standard brushing grade.
 - d. Cadmium plated: ASTM A165.

F. Forms

1. To be constructed of approved concrete, steel, wood or fiberglass reinforced plastic or high-density overlaid plywood to obtain the quality of the finish specified. Forms shall be designed to withstand vibration and anticipated lateral forces.
2. Forms shall be of such rigidity as to ensure sectional dimensions as outlined in MNL 116.
3. Parting Compound: Non-oil base

G. Grout

1. Cement Grout: Portland cement, ASTM C150, Type I and clean, natural sand, ASTM C404. Mix at ratio of 1.0-part cement to 3 parts sand, by volume, with minimum water required for placement and hydration.
2. Non-metallic, non-corrosive, non-staining product containing selected silica sands, Portland cement, shrinkage compensating materials, water-reducing admixtures, complying with ASTM C 1107.

H. Bearing Pads

1. Tempered hardboard
2. Plastic: Multi-monomer plastic strips shall be non-leaching and support construction loads with no visible overall expansion.
3. Chloroprene (Neoprene): Conform to Division II, Section 25 of AASHTO Standard Specification for Highway Bridges.
4. Laminated fabric-rubber pads: Preformed, unused synthetic fibers and new unvulcanized rubber. Surface hardness of 80 Shore A durometer plus or minus 10 percent.
5. Expansion bearing pads: Assemblies consisting of lower and upper components. The upper component shall consist of a stainless-steel support plate and a sheet of stainless (14 gage minimum) with a minimum 2B mill finish. It shall be larger than the lower element by at

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least ½ inch in each direction. The lower element shall consist of a bearing pad, a stainless support plate and a bonded contact layer of Teflon.

I. Concrete Mixes

1. General: Concrete mixes shall be proportioned to develop the required strength using either laboratory trial batch or field experience methods as specified in ACI 318, Chapter 5.
2. Freeze-thaw durability: Concrete exposed to freeze-thaw cycles shall be air entrained to produce a total air content in accordance with ACI 318, Chapter 4.
3. Compressive strength: The 28-day specified compressive strength of the concrete to be incorporated into each component shall be shown on the shop drawings. The minimum 28-day specified compressive strength for precast, prestressed components is 5,000 psi.

2.03 MANUFACTURE

A. General

1. Concrete for the precast components shall be batched in accordance with ASTM C 94.
2. Precast components shall be fabricated in accordance with PCI MNL 116 and ACI 318
3. Forms shall be cleaned between castings. Parting compound shall be applied to forms to insure against discoloration and keep surface imperfections to a minimum.
4. Dimensional tolerances shall be in accordance with PCI MNL 116.
5. The minimum release compressive strength for prestressed components is 3,000 psi.
6. Components shall be cured after form removal in a moist condition and at a minimum temperature of 50 deg F until field molded specimens cured under similar conditions have developed a minimum compressive strength of 3,000 psi.
7. Lift loops and erection inserts shall be furnished cast as shown on the production drawings.
8. Components shall be identified with a number on back face or other exposed area that identifies the orientation of the component in its final position.
9. Coat exposed ends of prestressing strands in all prestressed components to protect against corrosion.

PART 3 – EXECUTION

3.01 ENGINEERS INSPECTION

- A. The Engineer may elect to visit the manufacturer's plant to inspect and approve methods of control of the concrete mixes, component fabrication and curing methods, and approve first run production components no later than five days after the manufacturer's request. Access to the manufacturing facility shall be provided to the Engineer, Owner and the Owner's representative.

3.02 ERECTION

- A. Erection Equipment and Safety
 - 1. The erection contractor shall be responsible for safe erection and comply with applicable local and state safety regulations. Components shall be lifted by means of suitable lifting devices at points provided by the manufacturer.
 - 2. The erection contractor shall be responsible for becoming familiar with the Contract drawings, specifications and erection drawings.
 - 3. Each component shall be safely and adequately secured in position by positive mechanical connections.
 - 4. Temporary bracing shall be enough to brace work adequately.
 - 5. Connections are to be completed as erection progresses.
 - 6. Erection equipment shall not be bent, twisted, warped or damaged in any way. All wire ropes for cranes or lifting bars shall be of full sections -- not bent, twisted, kinked, torn or stretched. The lifting capacity of all lifting beams, platforms and trusses shall be posted.

3.03 SITE ACCESS

- A. General Contractor shall be responsible for providing suitable access to the building, proper drainage and firm, level bearing for the hauling and erection equipment to operate under its own power.
- B. General Contractor shall make provisions as required for placement and accurate alignment of anchor bolts, plates or dowels in column footings, grade beams and other field placed supporting members.

3.04 INSTALLATION

- A. The manufacturer shall perform a field pre-erection survey prior to erection of precast members. Any discrepancies shall be reported to the contractor as soon as they are discovered for correction prior to start of precast erection.

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- B. Work shall be executed by workmen skilled in this trade, set work plumb, true and square with joints parallel and uniform, all in accordance with the approved erection drawings. Shims and bearing plates shall be accurately placed.
- C. Clean up: At the completion of the work, and at other such times directed by the Engineer, all rejected and surplus materials, rubbish and apparatus shall be removed from the project site.

3.05 ALIGNMENT

- A. Components shall be properly aligned and leveled as required by the shop drawings. Variations between adjacent components shall be reasonably leveled out by jacking, loading or any other feasible method as recommended by the manufacturer and acceptable to the Engineer.
- B. Components shall be erected as shown on the contract and shop drawings in conformance with PCI Committee Report "Tolerances for Precast and Prestressed Concrete", PCI Journal, Vol. 30, #1, January-February 1985.

3.06 CLEAN UP

- A. As work progresses, all excess or foreign materials which would become difficult to remove from finished surfaces, or which would harden on finished surfaces shall be removed.
- B. On completion of the work, all surplus materials, tools, equipment and debris, leaving the building in a clean condition shall be removed to the satisfaction of the Owner.
- C. Final cleaning of all material is the responsibility of the general contractor/construction manager of the project.

3.07 INSPECTION AND ACCEPTANCE OF WORK

- A. Final acceptance and acceptance of erected precast components shall be made by the Engineer to verify conformance with plans and specifications.
- B. Components incorporating concrete that has failed to meet strength requirements of plans and specifications when evaluated in accordance with ACI 318 shall be cored as directed by the Engineer. Unit may be rejected and replaced at the Engineer's discretion after the core test. The costs of these tests shall be borne by this subcontractor.

END OF SECTION

SECTION 04 05 13
MASONRY MORTARING

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. Section specifies mortar materials and mixes.

1.02 RELATED WORK:

- A. Mortar used in Section:

1. Section 04 20 00, CONCRETE UNIT MASONRY.

1.03 REFERENCES:

- A. Publications listed below form a part of specification to extent referenced.
Publications are referenced in text by basic designation only.

- B. American Society for Testing and Materials (ASTM):

C40-04	Organic Impurities in Fine Aggregates for Concrete
C91-05	Masonry Cement
C109-07	Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-MM Cube Specimens)
C144-04	Aggregate for Masonry Mortar
C150-05	Portland Cement
C207-06	Hydrated Lime for Masonry Purposes
C270-07	Mortar for Unit Masonry
C307-03	Tensile Strength of Chemical - Resistant Mortar, Grouts, and Monolithic Surfacing
C321-00/R05.....	Bond Strength of Chemical-Resistant Mortars
C348-02	Flexural Strength of Hydraulic Cement Mortars
C595-08	Blended Hydraulic Cement
C780-07	Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
C979-05	Pigments for Integrally Colored Concrete
C1329-05	Mortar Cement

1.04 TESTING LABORATORY-CONTRACTOR RETAINED:

- A. Engage a commercial testing laboratory approved by Engineer to perform tests specified below.

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- B. Submit information regarding testing laboratory's facilities and qualifications of technical personnel to Engineer.

1.05 TESTS:

- A. After tests have been made and materials approved, do not change without additional test and approval of Engineer.
- B. Testing:
 - 1. Test materials proposed for use for compliance with specifications in accordance with test methods contained in referenced specifications and as follows:
 - 2. Mortar:
 - a. Test for compressive strength and water retention; ASTM C270.
 - 3. Mortar compressive strengths 28 days as follows:
Type M: Minimum 2500 psi at 28 days.
Type S: Minimum 1800 psi at 28 days. Type N: Minimum 750 psi at 28 days
 - 4. Cement:
 - a. Test for water soluble alkali (nonstaining) when nonstaining cement is specified.
 - b. Nonstaining cement shall contain not more than 0.03 percent water soluble alkali.
 - 5. Sand: Test for deleterious substances, organic impurities, soundness and grading.
- C. During progress of work, testing laboratory, takes and tests samples as specified in Section 01. Testing procedures and test methods in ASTM C780.

1.06 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. Certificates:
 - 1. Testing laboratory's facilities and qualifications of its technical personnel.
 - 2. Indicating that following items meet specifications:
 - a. Portland cement.
 - b. Masonry cement.
 - c. Mortar cement.
 - d. Hydrated lime.
 - e. Fine aggregate (sand).
 - f. Color admixture.
- C. Laboratory Test Reports:

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1. Mortar, each type.
2. Admixtures.

D. Manufacturer's Literature and Data:

1. Admixtures.
2. Liquid acrylic resin.

1.07 DELIVERY, STORAGE AND HANDLING:

- A. Deliver masonry materials in original sealed containers marked with name of manufacturer and identification of contents.
- B. Store masonry materials under waterproof covers on planking clear of ground, and protect damage from handling, dirt, stain, water and wind.

1.08 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MASONRY MORTAR:

- A. Conform to ASTM C270.
- B. Admixtures:
 1. Do not use mortar admixtures, unless approved by Resident Engineer.
 2. Submit laboratory test report showing effect of proposed admixture on strength, water retention, and water repellency of mortar.
 3. Do not use antifreeze compounds.
- C. Colored Mortar:
 1. Maintain uniform mortar color for exposed work throughout.
 2. Match mortar color in approved sample.
 3. Color of mortar for exposed work in alteration work to match color of existing mortar.
- D. Color Admixtures:
 1. Proportion as specified by manufacturer.

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2.02 COLOR ADMIXTURE:

- A. Pigments: ASTM C979.
- B. Use mineral pigments only. Organic pigments are not acceptable.
- C. Pigments inert, stable to atmospheric conditions, nonfading, alkali resistant and water insoluble.

PART 3 – EXECUTION

3.01 MIXING:

- A. Mix in a mechanically operated mortar mixer.
 - 1. Mix mortar for at least three minutes but not more than five minutes.'
- B. Measure ingredients by volume. Measure by the use of a container of known capacity.
- C. Mix water with dry ingredients in sufficient amount to provide a workable mixture which will adhere to vertical surfaces of masonry units.

3.02 MORTAR USE LOCATION:

- A. Use Type M mortar for precast concrete panels.
- B. Use Type S mortar for brick veneer over concrete back up walls.
- C. For brick veneer over frame back up walls, use Type N portland cement-lime mortar.
- D. Use Type N mortar for other masonry work, except as otherwise specified.

END OF SECTION

SECTION 04 05 16
MASONRY GROUTING

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

Section specifies grout materials and mixes.

1.02 RELATED WORK:

A. Grout used in Section:

1. Section 04 20 00, Concrete Unit Masonry.

1.03 TESTS:

A. Certified test reports.

B. Do not use materials until laboratory test reports are approved by Resident Engineer.

C. After tests have been made and materials approved, do not change without additional test and approval of Engineer.

D. Testing:

1. Test materials proposed for use for compliance with specifications in accordance with test methods contained in referenced specifications and as follows:
2. Grout:
 - a. Test for compressive strength; ASTM C1019.
 - b. Grout compressive strength of 2000 psi at 28 days.
3. Sand: Test for deleterious substances, organic impurities, soundness and grading.

1.04 SUBMITTALS:

A. Submit in accordance with Section 01 33 00 - Submittal Procedures

B. Certificates:

1. Indicating that following items meet specifications:
 - a. Masonry cement.
 - b. Grout.
 - c. Color admixture.

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C. Laboratory Test Reports:

1. Grout, each type.
2. Admixtures.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. Deliver masonry materials in original sealed containers marked with name of manufacturer and identification of contents.
- B. Store masonry materials under waterproof covers on planking clear of ground, and protect damage from handling, dirt, stain, water and wind.

1.06 REFERENCES:

- A. Publications listed below form a part of specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Society for Testing and Materials (ASTM):

C404-07Aggregate for Masonry Grout
C476-10Grout for Masonry
C595-10Blended Hydraulic Cement
C979-10Pigments for Integrally Colored Concrete
C1019-11Sampling and Testing

1.07 PAYMENTS:

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 HYDRATED LIME:

ASTM C207, TYPE S.

2.02 AGGREGATE FOR MASONRY GROUT:

ASTM C404, SIZE 8.

2.03 BLENDED HYDRAULIC CEMENT:

ASTM C595, TYPE IS, IP.

2.04 MASONRY CEMENT:

ASTM C91. Type N, S, or M.

2.05 PORTLAND CEMENT:

ASTM C150, Type I.

2.06 LIQUID ACRYLIC RESIN:

A formulation of acrylic polymers and modifiers in liquid form designed for use as an additive for mortar to improve physical properties.

2.07 WATER:

Potable, free of substances that are detrimental to grout, masonry, and metal.

2.08 GROUT:

A. Conform to ASTM C476 except as specified.

B. Grout type proportioned by volume as follows:

1. Fine Grout:

- a. Portland cement or blended hydraulic cement: one part.
- b. Hydrated lime: 0 to 1/10 part.
- c. Fine aggregate: 2-1/4 to three times sum of volumes of cement and lime used.

2. Coarse Grout:

- a. Portland cement or blended hydraulic cement: one part.
- b. Hydrated lime: 0 to 1/10 part.
- c. Fine aggregate: 2-1/4 to three times sum of volumes of cement and lime used.

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- d. Coarse aggregate: one to two times sum of volumes of cement and lime used.
- 3. Sum of volumes of fine and coarse aggregates: Do not exceed four times sum of volumes of cement and lime used. resistant and water insoluble.

PART 3 – EXECUTION

3.01 MIXING:

- A. Mix in a mechanically operated grout mixer.
 - 1. Mix grout for at least five minutes.
- B. Measure ingredients by volume. Measure by the use of a container of known capacity.
- C. Mix water with grout dry ingredients in sufficient amount to bring grout mixture to a pouring consistency.

3.02 GROUT USE LOCATIONS:

- A. Use fine grout for filling wall cavities and cells of concrete masonry units where the smallest dimension is 50 mm (2 inches) or less.
- B. Use either fine grout or coarse grout for filling wall cavities and cells of concrete masonry units where the smallest dimension is greater than 50 mm (2 inches).
- C. Do not use grout for filling bond beam or lintel units.

END OF SECTION

SECTION 04 20 00
CONCRETE UNIT MASONRY

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

This section specifies requirements for construction of masonry unit walls.

1.02 RELATED WORK

- A. Section 04 05 13 - Masonry Mortaring
- B. Section 04 05 16 - Masonry Grouting
- C. Section 05 50 00 - Metal Fabrications

1.03 REFERENCES:

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
 - A951-06 Steel Wire for Masonry Joint Reinforcement.
 - A615/A615M-09 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - C90-11 Load-Bearing Concrete Masonry Units
 - F1667-11 Fasteners: Nails, Spikes and Staples
- C. Masonry Industry Council:
 - Hot and Cold Weather Masonry Construction Manual-98 (R2000).
- D. American Welding Society (AWS):
 - D1.4-11 Structural Welding Code – Reinforcing Steel.
- E. Federal Specifications (FS):
 - FF-S-107C-00 Screws, Tapping and Drive
- F. Masonry Standards Joint Committee; Specifications for Masonry Structures TMS 602-08/ACI 530.1-08/ASCE 6-08 (2008 MSJC Book Version TMS-0402-08).

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1.04 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. Samples:
 - 1. Concrete Masonry Units (CMU), when exposed in finish work.
 - 2. Anchors, and ties, one each and joint reinforcing 1200 mm (48 inches) long.
- C. Certificates:
 - 1. Certificates signed by manufacturer, including name and address of contractor, project location, and the quantity, and date or dates of shipment of delivery to which certificate applies.
- D. Manufacturer's Literature and Data:
 - 1. Anchors, ties, and reinforcement.
 - 2. Shear keys.
 - 3. Reinforcing bars.

1.05 WARRANTY:

- A. Warrant exterior masonry walls against moisture leaks and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be five years.

1.06 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 CONCRETE MASONRY UNITS:

- A. Hollow and Solid Load-Bearing Concrete Masonry Units: ASTM C90.
 - 1. Unit Weight: normal weight
 - 2. Sizes: Modular.

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3. For molded faces used as a finished surface, use concrete masonry units with uniform fine to medium surface texture unless specified otherwise.
4. Use bullnose concrete masonry units at corners exposed in finished work with 25 mm (one inch) minimum radius rounded vertical exterior corners (bullnose units).
 - a. Split-face Units:
 - 1) Split-Rib Units: Rib shapes as shown.
 - 2) Ground Face Units:

2.02 ANCHORS, TIES, AND REINFORCEMENT:

- A. Steel Reinforcing Bars: ASTM A615M, deformed bars, grade as shown.
- B. Joint Reinforcement:
 1. Form from wire complying with ASTM A951.
 2. Galvanized after fabrication.
 3. Width of joint reinforcement 0.16 inches less than nominal width of masonry wall or partition.
 4. Cross wires welded to longitudinal wires.
 5. Joint reinforcement at least 10 feet in length.
 6. Joint reinforcement in rolls is not acceptable.
 7. Joint reinforcement that is crimped to form drip is not acceptable.
 8. Maximum spacing of cross wires 16 inch to longitudinal wires.
 9. Ladder Design:
 - a. Longitudinal wires deformed 0.20-inch diameter wire.
 - b. Cross wires 0.16-inch diameter.
 10. Trussed Design:
 - a. Longitudinal and cross wires not less than 4 mm (0.16-inch nominal) diameter.
 - b. Longitudinal wires deformed.
 11. Multiple Wythes and Cavity wall ties:
 - a. Longitudinal wires 0.16 inch, two in each wythe with ladder truss wires 4 mm (0.16 inch) overlay, welded to each longitudinal wire.
 - b. Longitudinal wires 0.16 inch with U shape 0.16-inch rectangular ties extending into other wythe not less than 3 inches spaced 16 inches. Adjustable type with U shape tie designed to receive 0.16-inch pintle projecting into other wythe 3 inches min.

2.03 PREFORMED COMPRESSIBLE JOINT FILLER:

- A. Thickness and depth to fill the joint as specified.
- B. Closed Cell Neoprene: ASTM D1056, Type 2, Class A, Grade 1, B2F1.
- C. Non-Combustible Type: ASTM C612, Class 5, 1800 degrees F.

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2.04 ACCESSORIES:

- A. Weep Hole Wicks: Glass fiber ropes, 10 mm (3/8 inch) minimum diameter, 300 mm (12 inches) long.
- B. Box Board:
 - 1. Mineral Fiber Board: ASTM C612, Class 1.
 - 2. 1-inch thickness.
 - 3. Other spacing material having similar characteristics may be used subject to the Resident Engineer's approval.
- C. Masonry Cleaner:
 - 1. Detergent type cleaner selected for each type masonry used.
 - 2. Acid cleaners are not acceptable.
 - 3. Use soapless type specially prepared for cleaning brick or concrete masonry as appropriate.
- D. Fasteners:
 - 1. Concrete Nails: ASTM F1667, Type I, Style 11, 19 mm (3/4 inch) minimum length.
 - 2. Masonry Nails: ASTM F1667, Type I, Style 17, 19 mm (3/4 inch) minimum length.
 - 3. Screws: FS-FF-S-107, Type A, AB, SF thread forming or cutting.

PART 3 – EXECUTION

3.01 CONSTRUCTION TOLERANCES:

- A. Lay masonry units plumb, level and true to line within the tolerances as per MSJC requirements and as follows:
- B. Maximum variation from plumb:
 - 1. In 10 feet 1/4 inch
 - 2. In 20 feet 3/8 inch
 - 3. In 40 feet) or more 1/2 inch.
- C. Maximum variation from level:
 - 1. In any bay or up to 20 feet 1/4 inch.
 - 2. In 40 feet or more 1/2 inch

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- D. Maximum variation from linear building lines:
 - 1. In any bay or up to 20 feet 1/2 inch
 - 2. In 40 feet or more 3/4 inch
- E. Maximum variation in prepared opening dimensions:
 - 1. Accurate to minus 0 inch
 - 2. Plus 1/4 inch

3.02 INSTALLATION:

- A. Keep finish work free from mortar smears or spatters and leave neat and clean.
- B. Anchor masonry as specified in Paragraph, ANCHORAGE.
- C. Wall Openings:
 - 1. Fill hollow metal frames built into masonry walls and partitions solid with mortar as laying of masonry progresses.
 - 2. If items are not available when walls are built, prepare openings for subsequent installation.
- D. Tooling Joints:
 - 1. Do not tool until mortar has stiffened enough to retain thumb print when thumb is pressed against mortar.
 - 2. Tool while mortar is soft enough to be compressed into joints and not raked out.
 - 3. Finish joints in exterior face masonry work with a jointing tool, and provide smooth, water-tight concave joint unless specified otherwise.
 - 4. Tool Exposed interior joints in finish work concave unless specified otherwise.
- E. Partition Height:
 - 1. as indicated on the drawings
- F. Lintels:
 - 1. Lintels are not required for openings less than 3 feet 4 inches wide that have hollow metal frames.
 - 2. Openings 3 feet 5 inches wide to 5 feet 4 inches wide with no structural steel lintel or frames, require a lintel formed of concrete masonry lintel or bond beam units.

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3. Use steel lintels, for openings over 5 feet 4 inches wide. Doors having overhead concealed door closers require a steel lintel, and a pocket for closer box.
4. Length for minimum bearing of 4 inches at ends.

G. Wall, Furring, and Partition Units:

1. Lay out field units to provide for running bond of walls and partitions, with vertical joints in second course centering on first course units unless specified otherwise.
2. Align head joints of alternate vertical courses.
3. At sides of openings, balance head joints in each course on vertical center lines of openings.
4. Use no piece shorter than 4 inches long.
5. On interior partitions provide a 1/4-inch open joint for caulking between abutting masonry partitions.
6. Use not less than 4 inches nominal thick masonry for free standing furring unless shown otherwise.
7. Do not abut existing plastered surfaces except suspended ceilings with new masonry partitions.

H. Use not less than 100 mm (4 inches) nominal thick masonry for fireproofing steel columns unless shown otherwise.

I. Before connecting new masonry with previously laid, remove loosened masonry or mortar, and clean and wet work in place as specified under wetting.

J. When new masonry partitions start on existing floors, machine cut existing floor finish material down to concrete surface.

K. Structural Steel Encased in Masonry:

1. Where structural steel is encased in masonry and the voids between the steel and masonry are filled with mortar, provide a minimum 1 inch mortar free expansion space between the masonry and the steel by applying a box board material to the steel before the masonry is laid.
2. Do not place spacing material where steel is bearing on masonry or masonry is bearing on steel.

3.03 REINFORCEMENT:

A. Steel Reinforcing Bars:

1. Install in cells of hollow masonry units where required for vertical reinforcement and in bond beam units for lintels and bond beam

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- horizontal reinforcement. Install in wall cavities of reinforced masonry walls where shown.
2. Use grade 60 bars if not specified otherwise.
 3. Bond Beams:
 - a. Form Bond beams of load-bearing concrete masonry units filled with ASTM C476 grout and reinforced with 2-#15m (#5) reinforcing steel unless shown otherwise. Do not cut reinforcement.
 - b. Brake bond beams only at expansion joints and at control joints, if shown.
 4. Stack Bond:
 - a. Locate additional joint reinforcement in vertical and horizontal joints as shown.
 - b. Anchor vertical reinforcement into the foundation or wall or bond beam below and hold in place.
 - c. Provide temporary bracing for walls over 8 ft. tall until permanent horizontal bracing is completed.
 5. Grout openings:
 - a. Leave cleanout holes in double wythe walls during construction by omitting units at the base of one side of the wall.
 - b. Locate 75 mm x 75 mm (3 in. x 3 in.) min. clean-out holes at location of vertical reinforcement.
 - c. Keep grout space clean of mortar accumulation and sand debris. Clean the grout space every day using a high pressure jet stream of water, or compressed air, or industrial vacuum, or by laying wood strips on the metal ties as the wall is built. If wood strips are used, lift strips with wires as the wall progresses and before placing each succeeding course of wall ties.

3.04 CMU CONTROL JOINTS:

- A. Provide brick expansion CMU control (CJ) joints where shown on drawings.
- B. Keep joint free of mortar and other debris.
- C. Where joints occur in masonry walls.
 1. Install preformed compressible joint filler in brick wythe.
 2. Install cross shaped shear keys in concrete masonry unit wythe with preformed compressible joint filler on each side of shear key unless otherwise specified.
 3. Install filler, backer rod, and sealant on exposed faces.
- D. Use standard notched concrete masonry units (sash blocks) made in full and half-length units where shear keys are used to create a continuous vertical joint.

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- E. Interrupt steel joint reinforcement at expansion and control joints unless otherwise shown.
- F. Fill opening in exposed face of expansion and control joints with sealant as specified in Section 07 92 00 - Joint Sealants.

3.05 BUILDING EXPANSION AND SEISMIC JOINTS:

- A. Keep joint free of mortar. Remove mortar and other debris.
- B. Install non-combustible, compressible type joint filler to fill space completely except where sealant is shown on joints in exposed finish work.
- C. Where joints are on exposed faces, provide depth for backer rod and sealant as specified in Section 07 92 00 - Joint Sealants, unless shown otherwise.

3.06 ISOLATION SEAL:

- A. Where full height walls or partitions lie parallel or perpendicular to and under structural beams or shelf angles, provide a separation between walls or partitions and bottom of beams or shelf angles not less than the masonry joint thickness unless shown otherwise.
- B. Insert in the separation, a continuous full width strip of non-combustible type compressible joint filler.
- C. Where exposed in finish work, cut back filler material in the joint enough to allow for the joint to be filled with sealant material specified in Section 07 92 00 - Joint Sealants.

3.07 CONCRETE MASONRY:

- A. Kind and Users:
 - 1. Provide special concrete masonry shapes as required, // including lintel and bond beam units, sash units, and corner units //. Use solid concrete masonry units, where full units cannot be used, or where needed for anchorage of accessories.
 - 2. Provide solid load-bearing concrete masonry units or grout the cell of hollow units at jambs of openings in walls, where structural members impose loads directly on concrete masonry, and where shown.
- B. Laying:
 - 1. Lay concrete masonry units with 3/8-inch joints, with a bond overlap of not less than 1/4 of the unit length, except where stack bond is required.
 - 2. Do not wet concrete masonry units before laying.

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3. Bond external corners of partitions by overlapping alternate courses.
4. Lay first course in a full mortar bed.
5. Set anchorage items as work progress.
6. Where ends of anchors, bolts, and other embedded items, project into voids of units, completely fill such voids with mortar or grout.
7. Provide a 1/4-inch open joint for caulking between abutting masonry partitions.
8. Lay concrete masonry units with full face shell mortar beds and fill head joint beds for depth equivalent to face shell thickness.
9. Lay concrete masonry units so that cores of units, that are to be filled with grout, are vertically continuous with joints of cross webs of such cores completely filled with mortar. Unobstructed core openings not less than 2 inches by 3 inches.
10. Do not wedge the masonry against the steel reinforcing. Minimum 1/2-inch clear distance between reinforcing and masonry units.
11. Install deformed reinforcing bars of sizes shown.
12. Steel reinforcement, at time of placement, free of loose flaky rust, mud, oil, or other coatings that will destroy or reduce bond.
13. Steel reinforcement in place before grouting.
14. Minimum clear distance between parallel bars: One bar diameter.
15. Hold vertical steel reinforcement in place by centering clips, caging devices, tie wire, or other approved methods, vertically at spacings noted.
16. Support vertical bars near each end and at intermediate intervals not exceeding 192 bar diameters.
17. Reinforcement shall be fully encased by grout or concrete.
18. Splice reinforcement or attach reinforcement to dowels by placing in contact and secured or by placing the reinforcement within 1/5 of the required bar splice length.
19. Stagger splices in adjacent horizontal reinforcing bars. Lap reinforcing bars at splices a minimum of 40 bar diameters.
20. Grout cells of concrete masonry units, containing the reinforcing bars, solid as specified under grouting.
21. Cavity and joint horizontal reinforcement may be placed as the masonry work progresses.

3.08 POINTING:

- A. Fill joints with pointing mortar using rubber float trowel to rub mortar solidly into raked joints.
- B. Wipe off excess mortar from joints of glazed masonry units with dry cloth.
- C. Finish exposed joints in finish work with a jointing tool to provide a smooth concave joint unless specified otherwise.

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3.09 GROUTING:

A. Preparation:

1. Clean grout space of mortar droppings before placing grout.
2. Close cleanouts.
3. Install vertical solid masonry dams across grout space for full height of wall at intervals of not more than 30 feet. Do not bond dam units into wythes as masonry headers.
4. Verify reinforcing bars are in cells of units or between wythes as shown.

B. Placing:

1. Place grout by hand bucket, concrete hopper, or grout pump.
2. Consolidate each lift of grout after free water has disappeared but before plasticity is lost.
3. Do not slush with mortar or use mortar with grout.
4. Interruptions:
 - a. When grouting must be stopped for more than an hour, top off grout 1-1/2 inch below top of last masonry course.
 - b. Grout from dam to dam on high lift method.
 - c. A longitudinal run of masonry may be stopped off only by raking back one-half a masonry unit length in each course and stopping grout 4 inches back of rake on low lift method.

C. Puddling Method:

1. Double wythe masonry constructed grouted in lifts not to exceed 12 inches or less than 2 inches wide.
2. Consolidate by puddling with a grout stick during and immediately after placing.
3. Grout the cores of concrete masonry units containing the reinforcing bars solid as the masonry work progresses.

D. Low Lift Method:

1. Construct masonry to a height of 5 ft. maximum before grouting.
2. Grout in one continuous operation and consolidate grout by mechanical vibration and reconsolidate after initial water loss and settlement has occurred.

E. High Lift Method:

1. Do not pour grout until masonry wall has properly cured a minimum of 4 hours.
2. Place grout in lifts not exceeding 5 ft.

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3. Exception:
Where the following conditions are met, place grout in lifts not exceeding 12.67 ft.
 - a. The masonry has cured for at least 4 hours.
 - b. The grout slump is maintained between 10 and 11 in.
 - c. No intermediate reinforced bond beams are placed between the top and the bottom of the pour height.
4. When vibrating succeeding lifts, extend vibrator 12 to 18 inches into the preceding lift to close any shrinkage cracks or separation from the masonry units.

3.10 PLACING REINFORCEMENT:

- A. General: Clean reinforcement of loose rust, mill scale, earth, ice or other materials which will reduce bond to mortar or grout. Do not use reinforcement bars with kinks or bends not shown on the Contract Drawings or final shop drawings, or bars with reduced cross-section due to excessive rusting or other causes.
- B. Position reinforcement accurately at the spacing indicated. Support and secure vertical bars against displacement. Horizontal reinforcement may be placed as the masonry work progresses. Where vertical bars are shown in close proximity, provide a clear distance between bars of not less than the nominal bar diameter or 1 inch, whichever is greater.
- C. For columns, piers and pilasters, provide a clear distance between vertical bars as indicated, but not less than 1 1/2 times the nominal bar diameter or 1-1/2 inches, whichever is greater. Provide lateral ties as indicated.
- D. Splice reinforcement bars where shown; do not splice at other places unless accepted by the Resident Engineer. Provide lapped splices, unless otherwise indicated. In splicing vertical bars or attaching to dowels, lap ends, place in contact and wire tie.
- E. Provide not less than minimum lap as indicated on shop drawings, or if not indicated, as required by governing code.
- F. Embed metal ties in mortar joints as work progresses, with a minimum mortar cover of 5/8 inch on exterior face of walls and 1/2 inch at other locations.
- G. Embed prefabricated horizontal joint reinforcement as the work progresses, with a minimum cover of 5/8 inch on exterior face of walls and 1/2 inch at other locations. Lap joint reinforcement not less than 6 inches at ends. Use prefabricated "L" and "T" sections to provide continuity at corners and intersections. Cut and bend joint reinforcement as recommended by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.

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- H. Anchoring: Anchor reinforced masonry work to supporting structure as indicated.
- I. Anchor reinforced masonry walls to non-reinforced masonry where they intersect.

3.11 INSTALLATION OF REINFORCED CONCRETE UNIT MASONRY:

- A. Do not wet concrete masonry units (CMU).
- B. Lay CMU units with full-face shell mortar beds. Fill vertical head joints (end joints between units) solidly with mortar from face of unit to a distance behind face equal to not less than the thickness of longitudinal face shells. Solidly bed cross-webs of starting courses in mortar. Maintain head and bed joint widths shown, or if not shown, provide 3/8-inch joints.
- C. Where solid CMU units are shown, lay with full mortar head and bed joints.
- D. Walls:
 - 1. Pattern Bond: Lay CMU wall units in 1/2-running bond with vertical joints in each course centered on units in courses above and below, unless otherwise indicated. Bond and interlock each course at corners and intersections. Use special-shaped units where shown, and as required for corners, jambs, sash, control joints, lintels, bond beams and other special conditions.
 - 2. Maintain vertical continuity of core or cell cavities, which are to be reinforced and grouted, to provide minimum clear dimension indicated and to provide minimum clearance and grout coverage for vertical reinforcement bars. Keep cavities free of mortar. Solidly bed webs in mortar where adjacent to reinforced cores or cells.
 - 3. Where horizontal reinforced beams (bond beams) are shown, use special units or modify regular units to allow for placement of continuous horizontal reinforcement bars. Place small mesh expanded metal lath or wire screening in mortar joints under bond beam courses over cores or cells of non-reinforced vertical cells or provide units with solid bottoms.
- E. High-Lift Grouting:
 - 1. Do not use high-lift grouting technique for grouting of CMU unless minimum cavity dimension and area is 3 inches and 10 square inches, respectively.
 - 2. Provide cleanout holes in first course at all vertical cells which are to be filled with grout.
 - 3. Use units with one face shell removed and provide temporary supports for units above, or use header units with concrete brick supports, or cut openings in one face shell.

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4. Construct masonry to full height of maximum grout pour specified, prior to placing grout.
5. Limit grout lifts to a maximum height of 5 feet and grout pour to a maximum height of 24 feet, for single wythe hollow concrete masonry walls, unless otherwise indicated.
6. Place vertical reinforcement before grouting. Place before or after laying masonry units, as required by job conditions. Tie vertical reinforcement to dowels at base of masonry where shown and thread CMU over or around reinforcement. Support vertical reinforcement at intervals not exceeding 192 bar diameters nor 30 feet.
7. Where individual bars are placed after laying masonry, place wire loops extending into cells as masonry is laid and loosed before mortar sets. After insertion of reinforcement bar, pull loops and bar to proper position and tie free ends.
8. Where reinforcement is prefabricated into cage units before placing, fabricate units with vertical reinforcement bars and lateral ties of the size and spacing indicated.
9. Place horizontal beam reinforcement as the masonry units are laid.
10. Embed lateral tie reinforcement in mortar joints where indicated. Place as masonry units are laid, at vertical spacing shown.
11. Where lateral ties are shown in contact with vertical reinforcement bars, embed additional lateral tie reinforcement in mortar joints. Place as shown, or if not shown, provide as required to prevent grout blowout or rupture of CMU face shells, but provide not less than 8 gage wire ties spaced 16 inches o.c. for members with 20 inches or less side dimensions, and 8 inches o.c. for members with side dimensions exceeding 20 inches.
12. Preparation of Grout Spaces: Prior to grouting, inspect and clean grout spaces. Remove dust, dirt, mortar droppings, loose pieces of masonry and other foreign materials from grout spaces. Clean reinforcement and adjust to proper position. Clean top surface of structural members supporting masonry to ensure bond. After final cleaning and inspection, close cleanout holes and brace closures to resist grout pressures.
13. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist displacement of masonry units and breaking of mortar bond. Install shores and bracing, if required, before starting grouting operations.
14. Place grout by pumping into grout spaces unless alternate methods are acceptable to the Resident Engineer.
15. Limit grout pours to sections which can be completed in one working day with not more than one hour interruption of pouring operation. Place grout in lifts which do not exceed 5 feet. Allow not less than 30 minutes, nor more than one hour between lifts of a given pour. Mechanically consolidate each grout lift during pouring operation.
16. Place grout in lintels or beams over openings in one continuous pour.

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17. Where bond beam occurs more than one course below top of pour, fill bond beam course to within 1 inch of vertically reinforced cavities, during construction of masonry.
18. When more than one pour is required to complete a given section of masonry, extend reinforcement beyond masonry as required for splicing. Pour grout to within 1-1/2 inches of top course of first pour. After grouted masonry is cured, lay masonry units and place reinforcement for second pour section before grouting. Repeat sequence if more pours are required.

3.12 CLEANING AND REPAIR:

A. General:

1. Clean exposed masonry surfaces on completion.
2. Protect adjoining construction materials and landscaping during cleaning operations.
3. Cut out defective exposed new joints to depth of approximately 19 mm (3/4 inch) and repoint.
4. Remove mortar droppings and other foreign substances from wall surfaces.

B. Concrete Masonry Units:

1. Immediately following setting, brush exposed surfaces free of mortar or other foreign matter.
2. Allow mud to dry before brushing.

END OF SECTION

SECTION 04 93 00
MASONRY & CONCRETE CLEANING

PART 1 – GENERAL

1.01 RELATED WORK

A. Related Documents:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Related Sections:

1. Division 01 Section "General Requirements."
2. Division 01 Section "Special Procedures."
3. Division 03 Section "Cast in Place Concrete."
4. Division 04 Section "Concrete Unit Masonry".

1.02 REFERENCES

- A. Standard Specifications for Public Works Construction “The Greenbook” (2018 Edition) including 2012 San Diego Regional Supplement, and 2015 Supplement by DeLorenzo International.**

1.03 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures**
- B. Product Data:** Submit manufacturer’s technical data including recommendations for their application and use.

1.04 QUALITY ASSURANCE:

- A. Qualifications of Applicator:** Applicator shall have experience in application of cleaning materials and methods of types required on substrates like that of this Project.
- B. Test Application:** Prior to start of general cleaning, clean face brick mock-up wall on job site to ensure that there are no negative reactions, and that the cleaning materials and methods do not cause color fade, streaking, or any other adverse reactions.

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1. Allow waiting period of not less than 7 calendar days after completion of sample cleaning to permit study of sample panels for negative reactions.
2. Should test cleaning reveal that a change in cleaning chemicals or techniques is required to obtain desired results or to overt negative reactions, all such changes or modifications shall be made at no additional cost.
3. Obtain Architect's and Owner's Representative acceptance of visual qualities before proceeding with the Work.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. General: Comply with requirements specified in Section 01 60 00 – Product Substitutions.
- B. Deliver materials to site in manufacturer's original and unopened containers and bearing labels as to type and names of products and manufacturers.

1.06 PROJECT CONDITIONS:

- A. Weather Conditions:
 1. Clean surfaces only when air temperatures are 40 degrees F and above and will remain so until masonry has dried out, but for not less than 7 days after completion of cleaning.
 2. Do not clean surfaces during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
- B. Protection:
 1. Prevent chemical cleaning solution from coming into contact with pedestrians, motor vehicles, landscaping, and other surfaces which could be injured or damaged by such contact.
 2. All surface mounted items shall be completely covered; maintain sufficient ventilation to avoid build-up of potentially damaging fumes.
 3. Dispose of run-off from cleaning operations by legal means and in manner which prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

1.07 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.

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- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 CLEANING MATERIALS:

- A. Type and Manufacturer: ProSoCo, Inc. “Vana Trol”, or approved equal masonry cleaner which is recommended by the manufacturer for cleaning surfaces identical to that required for this Project.
- B. Other Types of Chemical Cleaners: Provide other types of cleaners at no additional cost, if required, to remove isolated or specific stains or scum. If other cleaners are needed, then test application as previously specified shall be conducted to determine their suitability.
- C. Water: Clean, potable.

PART 3 – EXECUTION

3.01 PREPARATION:

- A. General: Comply with recommendations of manufacturers of chemical cleaners for protecting building surfaces against damage from exposure to their products.
- B. Protection: Protect glass, windows, doors, metal trim and other non-masonry surfaces from contact with chemical cleaners by covering with polyethylene sheeting and waterproof masking tape. Exercise care when installing protection material so as to prevent any pin holes or gaps which will allow cleaner to get behind the protective surface and cause damage.

3.02 CLEANING:

- A. General:
 - 1. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other.
 - 2. Perform cleaning in a manner which results in uniform coverage of surfaces, and which produces an even effect without streaking or damage to masonry and concrete surfaces. To avoid streaking, keep adjacent and lower wall surfaces wet and rinsed free of cleaning residues.
 - 3. Rinse off chemical residue by working from top to bottom to top of each treated area at each stage or scaffold setting.

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- B. Cleaning Solution: Dilute chemical cleaning materials with water to produce solutions of concentration used on the approved mock-up wall. It is the intent of this specification that the mildest, most effective solutions be used, subject to visual acceptance of test cleaning applications.
- C. Cleaner Application:
1. Thoroughly presoak or saturate a large portion of surface to prevent absorption of the cleaning solution within the pores of the masonry and precast concrete.
 2. Apply diluted chemical cleaner freely to surfaces using masonry brushes in accordance with chemical manufacturer's recommendations. Do not use spray equipment for applying cleaner.
 3. Allow cleaning solution to remain on surface for a period of time as recommended by the manufacturer which is depended on absorption rate of masonry and concrete and drying conditions; in no case allow chemicals to remain on surface for period longer than that recommended by manufacturer or where streaking may occur. Do not allow cleaner to dry on surfaces.
 4. Repeat chemical cleaning procedure when required to produce effect established by test application. Do not apply chemical cleaners to same surfaces more than twice. If mortar deposits are not softened after initial application, allow the solution to remain on the wall for a longer period of time, making sure that the cleaner does not dry into the masonry or concrete.
 5. Rinse surfaces thoroughly with fresh water, removing cleaning materials, free sand, loose material and debris.
 6. To ensure that chemical cleaner is removed after rising, periodically check the acidity of the masonry and concrete using pH test strips. Surface pH shall not exceed 6 to 9. Re-rinse and/or neutralize surfaces if required.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. This section specifies items and assemblies fabricated from structural steel shapes and other materials as shown.
- B. Items shown.
 - 1. Prefabricated Stairs
 - 2. Prefabricated Handrails
 - 3. Misc. Steel Posts
 - 4. Metal Beam and Post brackets

1.02 RELATED WORK:

- A. Prime and finish painting: Section 09 91 00, PAINTING.

1.03 REFERENCES:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
A36/A36M05.....Structural Steel

1.04 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MATERIALS:

- A. Structural Steel: ASTM A36.

2.02 HARDWARE:

- A. Rough Hardware:

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1. Furnish rough hardware with a standard plating, applied after punching, forming and assembly of parts; galvanized, cadmium plated, or zinc-coated by electro- galvanizing process. Galvanized G-90 where specified.
2. Use G90 galvanized coating on ferrous metal for exterior work unless non- ferrous metal or stainless is used.

B. Fasteners:

1. Bolts with Nuts:
 - a. ASME B18.2.2.
 - b. ASTM A307 for 415 MPa (60,000 psi) tensile strength bolts.
2. Screws: ASME B18.6.1.
3. Washers: ASTM F436, type to suit material and anchorage.

2.03 FABRICATION:

A. Size:

1. Size and thickness of members as shown.
2. When size and thickness is not specified or shown for an individual part, use size and thickness not less than that used for the same component on similar standard commercial items or in accordance with established shop methods.

B. Connections

1. Except as otherwise specified, connections may be made by welding, riveting or bolting.
2. Field riveting will not be approved.
3. Design size, number and placement of fasteners, to develop a joint strength of not less than the design value.
4. Holes, for rivets and bolts: Accurately punched or drilled and burrs removed.
5. Size and shape welds to develop the full design strength of the parts connected by welds and to transmit imposed stresses without permanent deformation or failure when subject to service loadings.
6. Use Rivets and bolts of material selected to prevent corrosion (electrolysis) at bimetallic contacts. Plated or coated material will not be approved.

C. Fasteners and Anchors

1. Use methods for fastening or anchoring metal fabrications to building construction as shown or specified.

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2. Where fasteners and anchors are not shown, design the type, size, location and spacing to resist the loads imposed without deformation of the members or causing failure of the anchor or fastener, and suit the sequence of installation.
3. Use material and finish of the fasteners compatible with the kinds of materials which are fastened together and their location in the finished work.
4. Fasteners for securing metal fabrications to new construction only, may be by use of threaded or wedge type inserts or by anchors for welding to the metal fabrication for installation before the concrete is placed or as masonry is laid.
5. Fasteners for securing metal fabrication to existing construction or new construction may be expansion bolts, toggle bolts, power actuated drive pins, welding, self-drilling and tapping screws or bolts.

D. Workmanship

1. General:
 - a. Fabricate items to design shown.
 - b. Furnish members in longest lengths commercially available within the limits shown and specified.
 - c. Fabricate straight, true, free from warp and twist, and where applicable square and in same plane.
 - d. Provide holes, sinkages and reinforcement shown and required for fasteners and anchorage items.
 - e. Provide openings, cut-outs, and tapped holes for attachment and clearances required for work of other trades.
 - f. Prepare members for the installation and fitting of hardware.
 - g. Cut openings in gratings and floor plates for the passage of ducts, sumps, pipes, conduits and similar items. Provide reinforcement to support cut edges.
 - h. Fabricate surfaces and edges free from sharp edges, burrs and projections which may cause injury.
2. Welding:
 - a. Weld in accordance with AWS.
 - b. Welds shall show good fusion, be free from cracks and porosity and accomplish secure and rigid joints in proper alignment.
 - c. Where exposed in the finished work, continuous weld for the full length of the members joined and have depressed areas filled and protruding welds finished smooth and flush with adjacent surfaces.
 - d. Finish welded joints to match finish of adjacent surface.
3. Joining:
 - a. Miter or butt members at corners.
 - b. Where frames members are butted at corners, cut leg of frame member perpendicular to surface, as required for clearance.

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4. Anchors:
 - a. Where metal fabrications are shown to be preset in concrete, weld 32 x 3 mm (1-1/4 by 1/8 inch) steel strap anchors, 150 mm (6 inches) long with 25 mm (one inch) hooked end, to back of member at 600 mm (2 feet) on center, unless otherwise shown.
 - b. Where metal fabrications are shown to be built into masonry use 32 x 3 mm (1-1/4 by 1/8 inch) steel strap anchors, 250 mm (10 inches) long with 50 mm (2 inch) hooked end, welded to back of member at 600 mm (2 feet) on center, unless otherwise shown.
5. Cutting and Fitting:
 - a. Accurately cut, machine and fit joints, corners, copes, and miters.
 - b. Fit removable members to be easily removed.
 - c. Design and construct field connections in the most practical place for appearance and ease of installation.
 - d. Fit pieces together as required.
 - e. Fabricate connections for ease of assembly and disassembly without use of special tools.
 - f. Joints firm when assembled.
 - g. Conceal joining, fitting and welding on exposed work as far as practical.
 - h. Do not show rivets and screws prominently on the exposed face.
 - i. The fit of components and the alignment of holes shall eliminate the need to modify component or to use exceptional force in the assembly of item and eliminate the need to use other than common tools.

E. Finish:

1. Finish exposed surfaces in accordance with NAAMM Metal Finishes Manual.
2. Steel and Iron: NAAMM AMP 504.
 - a. Zinc coated (Galvanized): ASTM A123, G90 at steel in contact with concrete or exterior.
 - b. Surfaces exposed in the finished work:
 - 1) Finish smooth rough surfaces and remove projections.
 - 2) Fill holes, dents and similar voids and depressions with epoxy type patching compound.
 - c. Shop Prime Painting:
 - 1) Surfaces of Ferrous metal:
 - a) Items not specified to have other coatings.
 - b) Galvanized surfaces specified to have prime paint.
 - c) Remove all loose mill scale, rust, and paint, by hand or power tool cleaning as defined in SSPC-SP2 and SP3.

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- d) Clean of oil, grease, soil and other detrimental matter by use of solvents or cleaning compounds as defined in SSPC-SP1.
 - e) After cleaning and finishing apply one coat of primer as specified in Section 09 91 00, PAINTING.
- F. Protection:
 - 1. Insulate non-compatible surfaces that will come in contact with concrete, masonry, plaster, or metals other than stainless steel, zinc or white bronze by giving a coat of heavy-bodied alkali resisting bituminous paint or other approved paint in shop.
 - 2. Spot prime all abraded and damaged areas of zinc coating which expose the bare metal, using zinc rich paint on hot-dip zinc coat items and zinc dust primer on all other zinc coated items.

PART 3 – EXECUTION

3.01 INSTALLATION:

- A. Set work accurately, in alignment and where shown, plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.
- B. Items set into concrete or masonry.
 - 1. Provide temporary bracing for such items until concrete or masonry is set.
 - 2. Place in accordance with setting drawings and instructions.
 - 3. Build strap anchors, into masonry as work progresses.
- C. Set frames of gratings, covers and similar items flush with finish floor or wall surface and, where applicable, flush with side of opening.
- D. Field weld in accordance with AWS.
 - 1. Design and finish as specified for shop welding.
 - 2. Use continuous weld unless specified otherwise.
- E. Install anchoring devices and fasteners as shown and as necessary for securing metal fabrications to building construction as specified. Power actuated drive pins may be used except for removable items and where members would be deformed or substrate damaged by their use.
- F. Spot prime all abraded and damaged areas of zinc coating as specified and all abraded and damaged areas of shop prime coat with same kind of paint used for shop priming.

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- G. Isolate aluminum from dissimilar metals and from contact with concrete and masonry materials as required to prevent electrolysis and corrosion.
- H. Secure escutcheon plate with set screw.

END OF SECTION

SECTION 06 00 00
PRESSURE-TREATED WOOD

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Pressure-treated wood

1.02 REFERENCES

- A. ADA
- B. OSHA
- C. AWPA C2
- D. AWPA C31

1.03 SUBMITTALS

- A. Product Data: Provide manufacturer's standard catalog data for specified products demonstrating compliance with referenced standards.
- B. Shop Drawings: Submit Shop Drawings for fabrication and installation.

1.04 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 DESIGN CRITERIA

- A. Structural Requirements: Provide railings capable of withstanding the following loads and stresses within limits and under conditions indicated on the Drawings:
 - 1. Handrails:
 - a. Uniform load of 50 lbs/ft. (0.73 kN/m) applied in any direction.
 - b. Concentrated load of 200 lbs/ft (0.89 kN) applied in any direction.

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- c. Railing shall comply with all requirements of the ADA and OSHA regulations.

2.02 PRESSURE-TREATED WOOD

- A. Preservative Treatment by Pressure Process: AWPAC2 (lumber), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPAC31 with inorganic boron (SBX).
- B. Kiln-dry material after treatment to a maximum moisture content of 19 percent.
- C. Mark each treated item with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- D. All treated wood shown on the drawings shall be Grade No. 2 or better lumber, pressure treated for rot resistance with a salt-based preservative ("Wolmanized" or "Osmose" – Kiln Dried). Creosote and asphaltic based preservatives are not acceptable.
- E. All Fire Retardant Treated (FRT) wood shown on the drawings shall be Wolmanized "Dricon", Hoover "Pyro-Guard", or Osmose "Flame Proof LHC-HTT".

PART 3 – EXECUTION

3.01 INSTALLATION - WOOD

- A. Set lumber to required levels and lines, with members plumb, true to line, cut, and fitted. Fit lumber to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Apply field treatment complying with AWPACM4 to cut surfaces of preservative-treated lumber.
- C. Securely attach lumber to substrate by anchoring and fastening as indicated on the plans.
- D. Fastening Methods: Use fasteners of appropriate type and length per plan and detail. Predrill members when necessary to avoid splitting wood.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

Section specifies wood framing and sheathing for light wood construction.

1.02 REFERENCES:

A. Military Specification (Mil. Spec.):

MIL-L-19140E Lumber and Plywood, Fire-Retardant Treated

B. U.S. Department of Commerce Product Standard (PS)

PS 1-95 Construction and Industrial Plywood

PS 20-05 American Softwood Lumber Standard

1.03 SUBMITTAL:

A. Submit for review and approval

1.04 DELIVERY, STORAGE AND HANDLING:

A. Protect lumber and other products from dampness both during and after delivery at site.

B. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.

C. Stack plywood and other board products to prevent warping.

1.05 PAYMENTS

A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.

B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 LUMBER:

- A. Unless otherwise specified, each piece of lumber bear grade mark, stamp, or other identifying marks indicating grades of material, and rules or standards under which produced.
 - 1. Identifying marks in accordance with rule or standard under which material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification.
 - 2. Inspection agency for lumber approved by the Board of Review, American Lumber Standards Committee, to grade species used.
- B. Structural Members: Species and grade as listed in the AFPA, National Design Specification for Wood Construction having design stresses as shown.
- C. Lumber Other Than Structural:
 - 1. Unless otherwise specified, species graded under the grading rules of an inspection agency approved by Board of Review, American Lumber Standards Committee.
 - 2. Framing lumber: Minimum extreme fiber stress in bending of 1100.
 - 3. Furring, blocking, nailers and similar items 4 inches and narrower Standard Grade; and, members 6 inches and wider, Number 2 Grade.
- D. Sizes:
 - 1. Conforming to Prod. Std., PS20.
 - 2. Size references are nominal sizes, unless otherwise specified, actual sizes within manufacturing tolerances allowed by standard under which produced.
- E. Moisture Content:
 - 1. At time of delivery and maintained at the site.
 - 2. Boards and lumber 2 inches and less in thickness: 19 percent or less.
 - 3. Lumber over 2 inches thick: 25 percent or less.
- F. Fire Retardant Treatment:
 - 1. Mil Spec. MIL-L-19140 with piece of treated material bearing identification of testing agency and showing performance rating.

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2. Treatment and performance inspection, by an independent and qualified testing agency that establishes performance ratings.

G. Preservative Treatment:

1. Do not treat Heart Redwood and Western Red Cedar.
2. Treat wood members and plywood exposed to weather or in contact with plaster, masonry or concrete, including framing of open roofed structures; sills, sole plates, furring, and sleepers that are less than 24 inches from ground; nailers, edge strips, blocking, crickets, curbs, cant, vent strips and other members used in connection with roofing and flashing materials.
3. Treat other members specified as preservative treated (PT).
4. Preservative treat by the pressure method complying with ASTM D1760, except any process involving the use of Chromated Copper arsenate (CCA) for pressure treating wood is not permitted.

2.02 PLYWOOD:

- A. Comply with Prod. Std., PS 1.
- B. Bear the mark of a recognized association or independent inspection agency that maintains continuing control over quality of plywood which identifies compliance by veneer grade, group number, span rating where applicable, and glue type.
- C. Sheathing:
1. APA rated Exposure 1 or Exterior; panel grade CD or better.
 2. Roof sheathing:
 - a. Minimum 11/32-inch-thick with span rating 24/0 or 15/32-inch-thick with span rating for supports 16 inches on center unless specified otherwise.
 - b. Minimum 19/32-inch-thick or span rating of 40/20 or 23/32-inch-thick or span rating of 48/24 for supports 24 inches on center.
- D. Underlayment:
1. APA rated Exposure 1 or Exterior, panel grade C-C Plugged.
 2. Minimum 6 mm (1/4-inch) thick or greater over plywood subflooring // and 9 mm (3/8-inch) thick or greater over board subflooring, // unless otherwise shown.

2.03 ROUGH HARDWARE AND ADHESIVES:

- A. Anchor Bolts:

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1. ASME B18.2.1 and ANSI B18.2.2 galvanized, 1/2 inch unless shown otherwise.
 2. Extend at least 8 inches into masonry or concrete with ends bent 2 inches.
- B. Miscellaneous Bolts: Expansion Bolts: C1D, A-A-55615; lag bolt, long enough to extend at least 65 mm (2-1/2 inches) into masonry or concrete. Use 1/2-inch bolt unless shown otherwise.
- C. Washers
1. ASTM F844.
 2. Use zinc or cadmium coated steel or cast iron for washers exposed to weather.
- D. Screws:
1. Wood to Wood: ANSI B18.6.1 or ASTM C1002.
 2. Wood to Steel: ASTM C954, or ASTM C1002.
- E. Nails:
1. Size and type best suited for purpose unless noted otherwise. Use aluminum-alloy nails, plated nails, or zinc-coated nails, for nailing woodwork exposed to weather and on roof blocking.
 2. ASTM F1667:
 - a. Common: Type I, Style 10.
 - b. Concrete: Type I, Style 11.
 - c. Barbed: Type I, Style 26.
 - d. Underlayment: Type I, Style 25.
 - e. Masonry: Type I, Style 27.
 - f. Use special nails designed for use with ties, strap anchors, framing connectors, joists hangers, and similar items. Nails not less than 1-1/4-inches long, 8d and deformed or annular ring shank.
- F. Framing and Timber Connectors:
1. Fabricate of ASTM A446, Grade A; steel sheet not less than 0.052 inch thick unless specified otherwise. Apply standard plating to steel timber connectors after punching, forming and assembly of parts.
 2. Framing Angles: Angle designed with bendable legs to provide three-way anchors.
 3. Straps:
 - a. Designed to provide wind and seismic ties with sizes as shown or specified.
 - b. Strap ties not less than 1-1/4 inches wide.
 - c. Punched for fastener.

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4. Timber Connectors: Fabricated of steel to shapes shown.
5. Joist Ties: Mild steel flats, 5 by 32 mm (3/16 by 1-1/4-inch size with ends bent about 30 degrees from horizontal and extending at least 400 mm (16 inches) onto framing. Punch each end for three spikes.
6. Wall Anchors for Joists and Rafters:
 - a. Mild steel strap, 3/16 by 1-1/4 inch with wall ends bent 2 inches or provide 9 by 3/8 by 5-inch pin through strap end built into masonry.
 - b. Strap long enough to extend onto three joists or rafters and punched for spiking at each bearing.
 - c. Strap not less than 4 inches embedded end.
7. Joint Plates:
 - a. Steel plate punched for nails.
 - b. Steel plates formed with teeth or prongs for mechanically clamping plates to wood.
 - c. Size for axial eccentricity, and fastener loads.

G. Adhesives:

1. For field-gluing plywood to lumber framing floor or roof systems: ASTM D3498.
2. For structural laminated Wood: ASTM D2559.

PART 3 – EXECUTION

3.01 INSTALLATION OF FRAMING AND MISCELLANEOUS WOOD MEMBERS:

A. Conform to applicable requirements of the following:

1. AFPA National Design Specification for Wood Construction for timber connectors.
2. AITC Timber Construction Manual for heavy timber construction.
3. AFPA WCD-number 1, Manual for House Framing for nailing and framing unless specified otherwise.
4. APA for installation of plywood or structural use panels.
5. ASTM F 499 for wood underlayment.
6. TPI for metal plate connected wood trusses.

B. Fasteners:

1. Nails.
 - a. Nail in accordance with the Recommended Nailing Schedule as specified in AFPA Manual for House Framing where detailed nailing requirements are not specified in nailing schedule. Select nail size and nail spacing sufficient to develop adequate strength for the connection without splitting the members.

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- b. Use special nails with framing connectors.
- c. For sheathing and subflooring, select length of nails sufficient to extend inch into supports.
- d. Use eight penny or larger nails for nailing through inch thick lumber and for toe nailing 2-inch-thick lumber.
- e. Use 16 penny or larger nails for nailing through 2-inch-thick lumber.
- f. Select the size and number of nails in accordance with the Nailing Schedule except for special nails with framing anchors.
- g. Nailing Schedule; Using Common Nails:
 - 1) Joist bearing on sill or girder, toe nail three-8d or framing anchor
 - 2) Bridging to joist, toe nail each end two-8d
 - 3) Ledger strip to beam or girder three-16d under each joint.
 - 4) Subflooring or Sheathing:
 - a) 6-inch-wide or less to each joist face nail two-8d.
 - b) Subflooring, more than 6 inches wide, to each stud or joint, face nail three-8d.
 - c) Plywood or structural use panel to each stud or joist face nail 8d, at supported edges 6 inches on center and at intermediate supports 10 inches on center. When gluing plywood to joint framing increase nail spacing to 12 inches at supported edges and 500 mm (20 inches) o.c. at intermediate supports.
 - 5) Sole plate to joist or blocking, through sub floor face nail 20d nails, 16 inches on center.
 - 6) Top plate to stud, end nail two-16d.
 - 7) Stud to sole plate, toe nail or framing anchor. Four-8d
 - 8) Doubled studs, face nail 16d at 24 inches on center.
 - 9) Built-up corner studs 16d at 24 inches 24 inches) on center.
 - 10) Doubled top plates, face nails 16d at 16 inches on center.
 - 11) Top plates, laps, and intersections, face nail two-16d.
 - 12) Continuous header, two pieces 16d at 16 inches on center along each edge.
 - 13) Ceiling joists to plate, toenail three-8d or framing anchor.
 - 14) Continuous header to stud, four 16d.
 - 15) Ceiling joists, laps over partitions, face nail three-16d or framing anchor.
 - 16) Ceiling joists, to parallel rafters, face nail three-16d.
 - 17) Rafter to plate, toe nail three-8d. or framing anchor. Brace 1-inch thick board to each stud and plate, face nail three-8d.
 - 18) Built-up girders and beams 20d at 32 inches on center along each edge.
- 2. Bolts:
 - a. Fit bolt heads and nuts bearing on wood with washers.
 - b. Countersink bolt heads flush with the surface of nailers.

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- c. Embed in concrete and solid masonry or use expansion bolts. Special bolts or screws designed for anchor to solid masonry or concrete in drilled holes may be used.
 - d. Use toggle bolts to hollow masonry or sheet metal.
 - e. Use bolts to steel over 0.112-inch, 11 gage in thickness. Secure wood nailers to vertical structural steel members with bolts, placed one at ends of nailer and 24-inch intervals between end bolts. Use clips to beam flanges.
 - 3. Drill Screws to steel less than 0.112 inch thick.
 - a. ASTM C1002 for steel less than 0.033 inch thick.
 - b. ASTM C 954 for steel over 0.033 inch thick.
 - 4. Power actuated drive pins may be used where practical to anchor to solid masonry, concrete, or steel.
 - 5. Do not anchor to wood plugs or nailing blocks in masonry or concrete. Use metal plugs, inserts or similar fastening.
 - 6. Screws to Join Wood:
 - a. Where shown or option to nails.
 - b. ASTM C1002, sized to provide not less than 1-inch penetration into anchorage member.
 - c. Spaced same as nails.
 - 7. Installation of Timber Connectors:
 - a. Conform to applicable requirements of the NFPA National Design Specification for Wood Construction.
 - b. Fit wood to connectors and drill holes for fasteners so wood is not split.
- C. Set sills or plates level in full bed of mortar on masonry or concrete walls.
- 1. Space anchor bolts 4 feet on centers between ends and within 6 inches of end. Stagger bolts from side to side on plates over 7 inches in width.
 - 2. Use shims of slate, tile or similar approved material to level wood members resting on concrete or masonry. Do not use wood shims or wedges.
 - 3. Closely fit and set to required lines.
- D. Cut notch, or bore in accordance with NFPA Manual for House-Framing for passage of ducts wires, bolts, pipes, conduits and to accommodate other work
- E. Roof Framing:
- 1. Set rafters with crown edge up.
 - 2. Form a true plane at tops of rafters.
 - 3. Valley, Ridge, and Hip Members:
 - a. Size for depth of as indicated on drawings
 - b. Straight and true intersections of roof planes.

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- c. Secure hip and valley rafters to wall plates by using framing connectors.
 - d. Butt joint and scab hip rafters longer than the available lumber.
- 4. Spike to wall plate and to ceiling joists except when secured with framing connectors.
- 5. Frame openings in roof with headers and trimmer rafters. Double headers carrying more than one rafter unless shown otherwise.
- 6. Install 2-inch by 4-inch strut between roof rafters and ceiling

END OF SECTION

SECTION 07 60 00
FLASHING AND SHEET METAL

PART 1 – GENERAL

1.01 SUMMARY OF WORK

A. Section Includes:

1. Flashing and sheet metal work.

1.02 RELATED WORK

A. Related Documents:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Related Sections:

1. Division 01 Section "General Requirements."
2. Division 01 Section "Special Procedures."
3. Division 07 Section "Joint Sealants".
4. Division 09 Section "Painting".

1.03 REFERENCES:

- A. The publications listed below for a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society for Testing and Materials (ASTM):

A653/A653M-07 Steel Sheet Zinc-Coated (Galvanized) or Zinc Alloy
Coated (Galvanized) by the Hot- Dip Process

B32-04 Solder Metal

D412-06 Vulcanized Rubber and Thermoplastic Elastomers-
Tension American National Standards Institute/Single
Ply Roofing Institute (ANSI/SPRI):

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ES-1-2003 Wind Design Standard for Edge Systems Used with
Low Slope Roofing Systems

- C. (NAAMM): AMP 500-505-88 Metal Finishes Manual
- D. Standard Specifications for Public Works Construction “The Greenbook”
(2012 Edition) including 2012 San Diego Regional Supplement, 2015 City of
Chula Vista Supplement, and 2015 Supplement by DeLorenzo International.
- E. American Architectural Manufacturers Association (AAMA):

605-98 Voluntary Specification for High Performance
Organic Coatings on Architectural Extrusions Panels

1.04 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. Manufacturer's Literature and Data:
 - 1. Two-piece counterflashing
 - 2. Thru wall and roof flashing

1.05 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or
unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for
measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MATERIALS:

- A. Solder: ASTM B32; flux type and alloy composition as required for use with
metals to be soldered.
- B. Galvanized Sheet: ASTM, A653.
- C. Fasteners:
 - 1. Nails:
 - a. Minimum diameter for stainless steel nails: 2 mm (0.095 inch) and
annular threaded.

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- b. Length to provide not less than 22 mm (7/8 inch) penetration into anchorage.
- 2. Rivets: Not less than 3 mm (1/8 inch) diameter.
- 3. Expansion Shields: Fed Spec A-A-1925A.
- D. Sealant: As specified in Section 07 92 00, JOINT SEALANTS for exterior locations.
- E. Roof Cement: ASTM D4586.

2.02 SHEET METAL THICKNESS:

- A. Except as otherwise shown or specified use thickness or weight of sheet metal as follows:
- B. Concealed Locations (Built into Construction):
 - 1. Galvanized steel: 0.021 inch thick.
- C. Thickness of aluminum or galvanized steel is specified with each item.

2.03 FABRICATION, GENERAL:

- A. Jointing:
 - 1. Joints shall conform to following requirements:
 - a. Flat-lock joints shall finish not less than 19 mm (3/4 inch) wide.
 - b. Lap joints subject to stress shall finish not less than 25 mm (one inch) wide and shall be soldered and riveted.
 - c. Unsoldered lap joints shall finish not less than 100 mm (4 inches) wide.
 - 2. Flat and lap joints shall be made in direction of flow.
- B. Expansion and Contraction Joints:
 - 1. Fabricate in accordance with the Architectural Sheet Metal Manual recommendations for expansion and contraction of sheet metal work in continuous runs.
 - 2. Space joints as shown or as specified.
 - 3. Fabricate joint covers of same thickness material as sheet metal served.
- C. Cleats:
 - 1. Fabricate cleats to secure flashings and sheet metal work over 12 inches wide and where specified.
 - 2. Provide cleats for maximum spacing of 12-inch centers unless specified otherwise.

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3. Form cleats of same metal and weights or thickness as the sheet metal being installed unless specified otherwise.

D. Drips:

1. Form drips at lower edge of sheet metal counter-flashings (cap flashings), wall copings, by folding edge back 1/2 inch and bending out 45 degrees from vertical to carry water away from the wall.
2. Form drip to provide hook to engage cleat or edge strip for fastening for not less than 3/4-inch loose lock where shown.

E. Edges:

1. Edges of flashings concealed in masonry joints opposite drain side shall be turned up 1/4 inch to form dam, unless otherwise specified or shown otherwise.
2. Finish exposed edges of flashing with a 1/4-inch hem formed by folding edge of flashing back on itself when not hooked to edge strip or cleat. Use 1/4-inch minimum penetration beyond wall face with drip for through-wall flashing exposed edge.
3. All metal roof edges shall meet requirements of CBC 2013.

2.04 FINISH:

- A. Use same finish on adjacent metal or components and exposed metal surfaces unless specified or shown otherwise.
- B. In accordance with NAAMM Metal Finishes Manual, unless otherwise specified.
- C. Finish exposed metal surfaces as follows, unless specified otherwise:
 1. Steel and Galvanized Steel:
 - a. Finish painted under Section 09 91 00, PAINTING unless specified as prefinished item.
 - b. Manufacturer's finish:
 - 1) Fluorocarbon Finish: AAMA 605, high performance organic coating.
- D. Skylight Flashing
 1. Install skylights in accordance with manufactures instructions and detailing in compliance with manufactures warranty against leakage.

2.05 REGLETS:

- A. Fabricate reglets of one of the following materials:

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1. Stainless steel, not less than 0.012 inch thick.
 2. Plastic coated extruded aluminum, not less than 0.055-inch-thick prefilled with butyl rubber sealer and complete with plastic wedges inserted at 40 inches on centers.
- B. Fill open-type reglets with fiberboard or other suitable separator, to prevent crushing of the slot during installation.
- C. Bend edges of reglets for setting into concrete to an angle of not less than 45 degrees and make wide enough to provide firm anchorage in the concrete.
- D. Fabricate reglets for building into horizontal masonry mortar joints not less than 3/4-inch-deep, nor more than one inch deep.
- E. Fabricate mitered corners, fittings, and special shapes as may be required by details.
- F. Reglets for concrete may be formed to receive flashing and have a 3/8-inch, 45-degree snap lock.

2.06 PIPE AND VENT FLASHING:

- A. Flashing at penetrations through roofing shall consist of a metal collar, sheet metal flashing sleeve and hood.
- B. Fabricate collar with roof flange of 0.047-inch minimum thick black iron or galvanized steel sheet.
1. Fabricate inside diameter of collar 4 inches larger than the outside diameter of the item penetration the roofing.
 2. Extend collar height from structural roof deck to not less than 14 inches above roof surface.
 3. Fabricate collar roof flange not less than 4 inches wide.
Option: Collar may be of steel tubing 0.125-inch minimum wall thickness, with not less than four, 2 inches by 4 inches by 0.125-inch-thick tabs bottom edge evenly spaced around tube in lieu of continuous roof flange.
 4. Fabricate sleeve roof flange not less than 4 inches wide.
 5. Extend sleeve around collar up to top of collar. Flange bottom of sleeve out not less than 1/24 inch and soldered to 4-inch-wide flange to make watertight.
 6. Fabricate interior diameter 2 inch greater than collar.
- C. Fabricate hood counter flashing from same material and thickness as sleeve.

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1. Fabricate the same as pipe counter flashing except allow not less than 4-inch lap below top of sleeve and to form vent space minimum of 4 inch wide.
 2. Hem bottom edge of hood 1/2 inch.
 3. Provide a 2-inch-deep draw band.
- D. Fabricate insect screen closure between sleeve and hood. Secure screen to sleeve with sheet metal screws.

PART 3 – EXECUTION

3.01 INSTALLATION:

A. General:

1. Install flashing and sheet metal items as shown in Sheet Metal and Air Conditioning Contractors National Association, Inc., publication, ARCHITECTURAL SHEET METAL MANUAL, except as otherwise shown or specified.
2. Apply Sealant as specified in Section 07 92 00, JOINT SEALANTS.
3. Apply sheet metal and other flashing material to surfaces which are smooth, sound, clean, dry and free from defects that might affect the application.
4. Remove projections which would puncture the materials and fill holes and depressions with material compatible with the substrate. Cover holes or cracks in wood wider than 1/4 inch with sheet metal compatible with the roofing and flashing material used.
5. Coordinate with masonry work for the application of a skim coat of mortar to surfaces of unit masonry to receive flashing material before the application of flashing.
6. Apply a layer of 15 pound saturated felt followed by a layer of rosin paper to wood surfaces to be covered with copper. Lap each ply 2 inch with the slope and nail with large headed copper nails.
7. Confine direct nailing of sheet metal to strips 12 inch or less wide. Nail flashing along one edge only. Space nail not over 4 inches on center unless specified otherwise.
8. Install bolts, rivets, and screws where indicated, specified, or required in accordance with the SMACNA Sheet Metal Manual. Space rivets at 3 inch on centers in two rows in a staggered position. Use neoprene washers under fastener heads when fastener head is exposed.
9. Coordinate with roofing work for the installation of metal base flashings and other metal items having roof flanges for anchorage and watertight installation.
10. Nail continuous cleats on 3 inches on centers in two rows in a staggered position.

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11. Nail individual cleats with two nails and bend end tab over nail heads. Lock other end of cleat into hemmed edge.
12. Install flashings in conjunction with other trades so that flashings are inserted in other materials and joined together to provide a watertight installation.
13. Where required to prevent galvanic action between dissimilar metal isolate the contact areas of dissimilar metal with sheet lead, waterproof building paper, or a coat of bituminous paint.
14. Isolate aluminum in contact with dissimilar metals others than stainless steel, white bronze or other metal compatible with aluminum by:
 - a. Paint dissimilar metal with a prime coat of zinc-chromate or other suitable primer, followed by two coats of aluminum paint.
 - b. Paint dissimilar metal with a coat of bituminous paint.
 - c. Apply an approved caulking material between aluminum and dissimilar metal.
15. Paint aluminum in contact with or built into mortar, concrete, plaster, or other masonry materials with a coat of bituminous paint.
16. Paint aluminum in contact with absorptive materials that may become repeatedly wet with two coats of bituminous paint or two coats of aluminum paint.

3.02 PIPE OR VENT FLASHING:

- A. Set collar where shown and secure roof tabs or flange of collar to structural deck with 1/2-inch diameter bolts.
- B. Set flange of sleeve base flashing not less than 4 inches beyond collar on all sides as specified for base flashing.

END OF SECTION

SECTION 07 61 16
STANDING SEAM SHEET METAL ROOFING

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

This section specifies the installation of standing seam metal roofing.

1.02 RELATED WORK:

Sealant: Section 07 92 00, JOINT SEALANTS.

1.03 REFERENCES:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only:
- B. American Society for Testing and Materials (ASTM):
 - B32-08 Solder Metal
 - D226-09 Asphalt Saturated Organic Felt Used In Roofing and Waterproofing
 - D2822-05 Asphalt Roofing Cement
 - F1667-11 Driven Fasteners: Nails, Spikes and Staples

1.04 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. Shop Drawings:
 - 1. Indicate thickness and dimensions of parts, fastenings and anchoring methods, details and locations of joints, transitions and other provisions necessary for thermal expansion and contraction.
 - 2. Indicate locations of field- and factory-applied sealant.
- C. Samples:
 - 1. Submit two samples, 12 inches long by full panel width, showing proposed metal thickness and seam profile.
 - 2. Submit standard color samples of metal for Architect's selection.
- D. Installer Qualifications: Submit list of completed projects, with names and contact information for architects and contractors.
- E. Test Reports: Indicating compliance of products with project requirements

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1.05 QUALITY ASSURANCE:

A. Installer Qualifications:

1. Three years' experience, minimum, in application of metal roof or wall panels.
2. Five satisfactory projects with metal panel work of similar scope and complexity to Work of this Project.
3. Installer must be approved by manufacturer in writing prior to bid. Approval document must be included with project bid.

B. Testing Agency Qualifications: Agency compliant with ISO/IEC Standard 17025, or an accredited independent agency recognized by the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement or ANSI.

1.06 DELIVERY, STORAGE, AND HANDLING:

A. Storage and Handling Requirements:

1. Keep panels and accessory items dry.
2. Protect against damage and discoloration.
3. Handle panels with non-marring slings.
4. Support panels to prevent permanent deformation.
5. Store panels above ground, with one end elevated for drainage.
6. Protect panels against standing water and condensation between adjacent surfaces.
7. If panels become wet, immediately separate sheets, wipe dry with clean cloth, and keep sheets separate for air-drying.
8. Painted panels shall be shipped with protective plastic sheeting or a strippable film coating between panels. Remove strippable film coating prior to installation. Do not allow strippable film coating to remain on panels in extreme heat, cold, or direct sunlight or other UV source.
9. Do not allow panels to contact treated lumber.

1.07 WARRANTY:

A. Manufacturer's Warranty: Manufacturer's standard 25-year performance warranty, stating the following:

1. Architectural fluorocarbon finish:
 - a. Will be free of fading or color change in excess of 5 Hunter delta-E units as determined by ASTM D2244-02.
 - b. Will not chalk in excess of numerical rating of 8 when measured in accordance with standard procedures specified in ASTM D4214-98 method D659.
 - c. Will not peel, crack, chip, or delaminate.

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2. Metal substrate will not rupture, fail structurally, or perforate.
- B. Installer's Warranty: Warrant panels, flashings, sealants, fasteners and accessories against defective materials and/or workmanship, covering repairs required to maintain roof panels watertight and weatherproof with normal usage for two years following Project Substantial Completion date.
 1. Furnish written warranty, signed by installer.

1.08 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 SYSTEM DESCRIPTION:

- A. Products: Provide the following:
 1. AEP Span, a Division of ASC Profiles, Inc.; Seam Narrow Batten
 2. Substitution Limitations: Substitutions will be considered in accordance with owner's approval
- B. Performance Criteria
 1. Wind Uplift: As required by ASCE 7, CBC 20113
 - a. Panel system shall be ASTM E1592 tested under the supervision of an ANSI or ISO/IEC accredited laboratory and the laboratory shall issue the test report.
 - b. Seam Narrow Batten: UL Construction #397, minimum 24 gauge panels, when installed over minimum 5/8" nominal plywood decking, with roof panel fastener clips spaced 24" on center maximum.
 2. Air Infiltration: <0.02 cfm per linear foot of joint when tested in accordance with ASTM E 283 at static test pressure differential of 20.0 psf.
 3. Water Penetration Under Static Pressure: No leakage through panel joints when tested in accordance with ASTM E 331 at static test pressure differential of 25.0 psf.
 4. Thermal Movements: Accommodate thermal movement without buckling, joint opening, overstressing components, failure of

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connections, or other detrimental effects, through the following temperature changes:

- a. 120 degrees F, ambient.
- b. 180 degrees F, material surface.

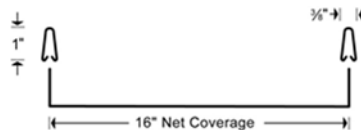
C. Sustainability Characteristics:

1. Recycled Content: 28.9
2. Energy Performance:
 - a. Provide Energy Star qualified product for slope indicated in Drawings.
 - b. Solar reflective index (SRI): Not less than 29 per ASTM E1980.
 - c. Reflectance and Emissivity:
 - 1) Solar Reflectance: Not less than 0.25 per ASTM test methods C1549 or E1918, or CRRC-1 Method #1.
 - 2) Thermal Emissivity: Not less than [0.75]<Insert requirement> per ASTM C1371.

2.02 PANELS:

A. Panels: AEP Span, a Division of ASC Profiles, Inc.; Preformed Metal Standing Seam Roofing – Select Seam Narrow Batten, Select Seam Curved Narrow Batten, and Select Seam Wide Batten.

1. Material: Steel conforming to ASTM A792.
 - a. 24 Gauge or 22 Gauge: Yield strength 50,000 psi; with aluminum-zinc alloy coating conforming to ASTM A792, Class AZ50.
 - b. Thickness and yield strength as required for performance indicated; with aluminum-zinc alloy coating conforming to ASTM A792, Class AZ50 For projects with multiple profiles or varied combinations of profiles, rib patterns and finishes, show on Drawings.
2. Panel Width and Pattern:
 - a. 16-inch panel width, with striated pattern.



3. Panel Rib Height:
 - a. Narrow batten cap 1-inch high x 3/8-inch wide
4. Panel Options:
 - a. Smooth curved-convex, in the factory or field
 - 1) Minimum radius of 4'
 - or
 - b. Tapered, singled sided or double sided

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5. Panel Finish: Provide primer and top finish coat on exposed faces; provide primer and backer coat on concealed faces of panels.
 - a. DuraTech® 5000: Polyvinylidene Fluoride, full 70 percent Kynar 500® or Hylar 5000®, consisting of a baked-on 0.15-0.20 mil corrosion resistant primer and a baked-on 0.70-0.80 mil finish coat with a specular gloss of 8 to 15 when tested in accordance with ASTM D523 at 60 degrees.
 - b. Panel Color: As selected from manufacturer's full range.
6. Seam Sealant: Factory apply high-grade butyl mastic sealant within the confines of narrow batten, designed to seal against adjacent male panel legs.

2.03 FRAMING AND SUBSTRATES:

- A. Sheathing: See Section 06 16 00 "Sheathing".
- B. Roofing Underlayment:
 1. Roofing Felt

2.04 CLIPS AND FASTENERS:

- A. Fasteners: As recommended by manufacturer for performance indicated.

2.05 INSULATION (NOT USED):

2.06 ACCESSORIES:

- A. Trims and Flashings: Material, metal thickness, and finish to match panels. Profiles indicated in Drawings.
 1. Provide manufacturer's standard accessories and other items essential to completeness of standing seam roof installation.
- B. Panel Penetration Flashings: As recommended by panel manufacturer; designed to provide sufficient movement to prevent creation of points of fixity at penetrations.
- C. Sealant for Field Application: High grade non-curing butyl or curing urethane sealant as recommended by panel manufacturer. Do not use sealant containing asphalt.

PART 3 – EXECUTION

3.01 EXAMINATION:

- A. Verification of Conditions: With Installer present.
 - 1. Examine conditions and substrates on which metal panels are to be installed. Structural support or substrate shall be flat and plumb to avoid panel stresses and distortion.
 - 2. Prior to starting work, correct defects.
- B. Field Measurements:
 - 1. Coordinate field measurements and fabrication schedule with construction progress.
 - 2. Field measure prior to fabrication. Show recorded dimensions on shop drawings, including locations of shop-fabricated openings.
 - 3. If field measurements differ from drawing dimensions, notify Architect prior to fabrication.
- C. Substrate Tolerances: Deviations from flat plane shall not exceed the following.
 - 1. 1/4 inch in 20 feet.
 - 2. 1/2 inch across building elevation.
 - 3. 1/8 inch in 5 feet.

3.02 PREPARATION:

- A. Substrate and Underlayment: Install according to approved metal panel manufacturer's recommendations.

3.03 INSTALLATION:

- A. INSTALLATION REQUIREMENTS: Install in accordance with SMACNA Architectural Sheet Metal Manual except as otherwise shown or specified.
- B. Panels and Trim: Comply with manufacturer's instructions for assembly, installation and erection for weather tight installation.
 - 1. Install according to approved shop drawings.
 - 2. Install panels in accordance with manufacturer's instructions and recommendations. Anchor securely in place using clips and fasteners spaced in accordance with manufacturer's recommendations for design wind load criteria.
 - 3. Comply with methods and recommendations of SMACNA Architectural Sheet Metal Manual for flashing configurations required.

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4. Discrepancies between job site conditions and shop drawings shall be brought to the attention of the Architect for resolution.
 5. Cutting and Fitting:
 - a. Cut panels neat, square, and true with shearing action cutters. Torch or power saw cutting is prohibited.
 - b. Openings 6 inches and larger: Shop fabricate and reinforce to maintain original load capacity.
 - c. Openings less than 6 inches: Field cutting is acceptable.
 6. Dissimilar Metals or Materials:
 - a. Where panel or trim may come in contact with dissimilar metals or treated lumber, fabricate transition to facilitate drainage and minimize possibility of galvanic action. Galvanic action can cause panels and trim to fail prematurely.
 - b. At points of contact with dissimilar metal or treated lumber, coat panel and trim with protective paint or separate materials with a weatherproof underlayment.
 - c. Direct contact or run-off from CCA, ACQ, CA, or other treated lumber (outdoor wood) or fire retardant impregnated or treated wood shakes or siding can cause panels and trim to fail prematurely. Avoid contact with these materials.
- C. Accessories: Install trims, flashings, and roofing specialties according to Drawings and manufacturer's recommended details.
- D. Sealant Installation: Apply according to approved shop drawings and SMACNA Architectural Sheet Metal Manual recommendations.
1. Provide airtight and waterproof installation.
- E. Installation Tolerances: Install per manufactures instructions

3.04 CLEANING:

- A. Repairs:
1. Touch up paint is not required for panels with scratches that do not expose metal.
 2. Panels or flashings with finish damage exposing metal or with substrate damage shall be replaced.
- B. Cleaning and Waste Management:
1. At completion of each day's work and at work completion, sweep panels, flashings, and gutters clean. Do not allow fasteners, cuttings, filings, or scraps to accumulate.

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2. Clean exposed surfaces of work promptly after completion of installation.

3.05 PROTECTION:

- A. Protect Work as required to ensure that roofing will be without damage at Final Completion.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

A. Related Documents:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section Includes: Execution and completion of Joint Sealants in accordance with the Specifications and Drawings.

1.02 RELATED WORK:

1. Division 01 Section "General Requirements."
2. Division 01 Section "Special Procedures."
3. Division 07 Section "Sheet Metal"
4. Division 07 Section "Metal Roof Panels"

1.03 REFERENCES:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Society for Testing and Materials (ASTM):

C509-06	Elastomeric Cellular Preformed Gasket and Sealing Material
C612-04	Mineral Fiber Block and Board Thermal Insulation.
C717-07	Standard Terminology of Building Seals and Sealants.
C834-05	Latex Sealants.
C919-02	Use of Sealants in Acoustical Applications.
C920-05	Elastomeric Joint Sealants.
C1021-08	Laboratories Engaged in Testing of Building Sealants.
C1193-05	Standard Guide for Use of Joint Sealants.
D1056-07	Specification for Flexible Cellular Materials- Sponge or Expanded Rubber
E84-08	Surface Burning Characteristics of Building Materials.

C. Sealant, Waterproofing and Restoration Institute (SWRI).

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- D. Standard Specifications for Public Works Construction “The Greenbook” (2012 Edition) including 2012 San Diego Regional Supplement, 2015 City of Chula Vista Supplement, and 2015 Supplement by DeLorenzo International.

1.04 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. Manufacturer's installation instructions for each product used.
- C. Cured samples of exposed sealants for each color where required to match adjacent material.
- D. Manufacturer's Literature and Data:
 - 1. Caulking compound
 - 2. Primers
 - 3. Sealing compound, each type, including compatibility when different sealants are in contact with each other.

1.05 PROJECT CONDITIONS:

- A. Environmental Limitations:
 - 1. Do not proceed with installation of joint sealants under following conditions:
 - a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 C (40 F).
 - b. When joint substrates are wet.
- B. Joint-Width Conditions:
 - 1. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions:
 - 1. Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.06 DELIVERY, HANDLING, AND STORAGE:

- A. Deliver materials in manufacturers' original unopened containers, with brand names, date of manufacture, shelf life, and material designation clearly marked thereon.

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- B. Carefully handle and store to prevent inclusion of foreign materials.
- C. Do not subject to sustained temperatures exceeding 40-degree F or less than 90-degree F.

1.07 WARRANTY:

- A. Warranty exterior sealing against leaks, adhesion, and cohesive failure, and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be extended to two years.
- B. General Warranty: Special warranty specified in this Article shall not deprive Government of other rights Government may have under other provisions of Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of Contract Documents.

1.08 PAYMENTS:

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 SEALANTS:

- A. S-1:
 - 1. ASTM C920, polyurethane or polysulfide.
 - 2. Type M.
 - 3. Class 25.
 - 4. Grade NS.
 - 5. Shore A hardness of 20-40
- B. S-2:
 - 1. ASTM C920, polyurethane or polysulfide.
 - 2. Type M.
 - 3. Class 25.
 - 4. Grade P.
 - 5. Shore A hardness of 25-40.
- C. S-3:
 - 1. ASTM C920, polyurethane or polysulfide.

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2. Type S.
3. Class 25, joint movement range of plus or minus 50 percent.
4. Grade NS.
5. Shore A hardness of 15-25.
6. Minimum elongation of 700 percent.

D. S-4:

1. ASTM C920 polyurethane or polysulfide.
2. Type S.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 25-40.

E. S-5:

1. ASTM C920, polyurethane or polysulfide.
2. Type S.
3. Class 25.
4. Grade P.
5. Shore hardness of 15-45.

F. S-6:

1. ASTM C920, silicone, neutral cure.
2. Type S.
3. Class: Joint movement range of plus 100 percent to minus 50 percent.
4. Grade NS.
5. Shore A hardness of 15-20.
6. Minimum elongation of 1200 percent.

G. S-7:

1. ASTM C920, silicone, neutral cure.
2. Type S.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 25-30.
6. Structural glazing application.

H. S-8:

1. ASTM C920, silicone, acetoxycure.
2. Type S.
3. Class 25.
4. Grade NS.

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5. Shore A hardness of 25-30.
6. Structural glazing application.

I. S-9:

1. ASTM C920 silicone.
2. Type S.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 25-30.
6. Non-yellowing, mildew resistant.

J. S-10:

1. ASTM C920, coal tar extended fuel resistance polyurethane.
2. Type M/S.
3. Class 25.
4. Grade P/NS.
5. Shore A hardness of 15-20.

K. S-11:

1. ASTM C920 polyurethane.
2. Type M/S.
3. Class 25.
4. Grade P/NS.
5. Shore A hardness of 35 to 50.

L. S-12:

1. ASTM C920, polyurethane.
2. Type M/S.
3. Class 25, joint movement range of plus or minus 50 percent.
4. Grade P/NS.
5. Shore A hardness of 25 to 50.

2.02 CAULKING COMPOUND:

- A. C-1: ASTM C834, acrylic latex.
- B. C-2: One component acoustical caulking, nondrying, non-hardening, synthetic rubber.

2.03 COLOR:

- A. Sealants used with exposed masonry shall match color of mortar joints.

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- B. Sealants used with unpainted concrete shall match color of adjacent concrete.
- C. Color of sealants for other locations shall be light gray or aluminum, unless specified otherwise.
- D. Caulking shall be light gray or white, unless specified otherwise.

2.04 JOINT SEALANT BACKING:

- A. General: Provide sealant backings of material and type that are no staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
 - 1. Type C: Closed-cell material with a surface skin.
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 32 degrees Celsius (minus 26 degrees Fahrenheit F). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.05 FILLER:

- A. Mineral fiber board: ASTM C612, Class 1.
- B. Thickness same as joint width.
- C. Depth to fill void completely behind back-up rod.

2.06 PRIMER:

- A. As recommended by manufacturer of caulking or sealant material.
- B. Stain free type.

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2.07 CLEANERS-NON POURIOUS SURFACES:

- A. Chemical cleaners acceptable to manufacturer of sealants and sealant backing material, free of oily residues and other substances capable of staining or harming joint substrates and adjacent non-porous surfaces and formulated to promote adhesion of sealant and substrates.

2.08 QUALITY CONTROL:

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in- service performance.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.
 - 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.
 - 3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C920 for adhesion and cohesion under cyclic movement, adhesion-in peel, and indentation hardness.
 - 4. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.
- D. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates in accordance with sealant manufacturer's recommendations:
 - 1. Locate test joints where indicated or, if not indicated, as directed by Contracting Officer.
 - 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 - b. Each type of non-elastomeric sealant and joint substrate indicated.
 - 3. Notify Resident Engineer seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.

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- E. VOC: Acrylic latex and Silicon sealants shall have less than 50g/l VOC content.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Inspect substrate surface for bond breaker contamination and unsound materials at adherent faces of sealant.
- B. Coordinate for repair and resolution of unsound substrate materials.
- C. Inspect for uniform joint widths and that dimensions are within tolerance established by sealant manufacturer.

3.02 PREPARATIONS:

- A. Prepare joints in accordance with manufacturer's instructions and SWRI.
- B. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.
 - 1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.
 - 2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- C. Do not cut or damage joint edges.
- D. Apply masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.

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1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Apply primer to sides of joints wherever required by compound manufacturer's printed instructions.
1. Apply primer prior to installation of back-up rod or bond breaker tape.
 2. Use brush or other approved means that will reach all parts of joints.
- F. Take all necessary steps to prevent three-sided adhesion of sealants.

3.03 BACKING INSTALLATION:

- A. Install back-up material, to form joints enclosed on three sides as required for specified depth of sealant.
- B. Where deep joints occur, install filler to fill space behind the back-up rod and position the rod at proper depth.
- C. Cut fillers installed by others to proper depth for installation of back-up rod and sealants.
- D. Install back-up rod, without puncturing the material, to a uniform depth, within plus or minus 3 mm (1/8 inch) for sealant depths specified.
- E. Where space for back-up rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.
- F. Take all necessary steps to prevent three-sided adhesion of sealants.

3.04 SEALANT DEPTHS AND GEOMETRY:

- A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.
- B. At widths over 6 mm (1/4 inch), sealant depth 1/2 of width up to 13 mm (1/2 inch) maximum depth at center of joint with sealant thickness at center of joint approximately 1/2 of depth at adhesion surface.

3.05 INSTALLATION:

- A. General:
1. Apply sealants and caulking only when ambient temperature is between 40 degrees F and 100 degrees F).
 2. Do not use polysulfide base sealants where sealant may be exposed to fumes from bituminous materials, or where water vapor in continuous contact with cementitious materials may be present.

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3. Do not use sealant type listed by manufacture as not suitable for use in locations specified.
 4. Apply caulking and sealing compound in accordance with manufacturer's printed instructions.
 5. Avoid dropping or smearing compound on adjacent surfaces.
 6. Fill joints solidly with compound and finish compound smooth.
 7. Tool joints to concave surface unless shown or specified otherwise.
 8. Finish paving or floor joints flush unless joint is otherwise detailed.
 9. Apply compounds with nozzle size to fit joint width.
 10. Test sealants for compatibility with each other and substrate. Use only compatible sealant.
- B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise.
- C. Where gypsum board partitions are of sound rated, fire rated, or smoke barrier construction, follow requirements of ASTM C919 only to seal all cut-outs and intersections with the adjoining construction unless specified otherwise.
1. Apply a 1/4-inch minimum bead of sealant each side of runners (tracks), including those used at partition intersections with dissimilar wall construction.
 2. Coordinate with application of gypsum board to install sealant immediately prior to application of gypsum board.
 3. Partition intersections: Seal edges of face layer of gypsum board abutting intersecting partitions, before taping and finishing or application of veneer plaster-joint reinforcing.
 4. Openings: Apply a 1/4-inch bead of sealant around all cut-outs to seal openings of electrical boxes, ducts, pipes and similar penetrations. To seal electrical boxes, seal sides and backs.
 5. Control Joints: Before control joints are installed, apply sealant behind control joint to reduce flanking path for sound through control joint.

3.06 FIELD QUALITY CONTROL:

- A. Field-Adhesion Testing: Field-test joint-sealant adhesion to joint substrates as recommended by sealant manufacturer:
1. Extent of Testing: Test completed elastomeric sealant joints as follows:
 - a. Perform 10 tests for first 1000 feet of joint length for each type of elastomeric sealant and joint substrate.
- B. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field adhesion test log.
- C. Inspect tested joints and report on following:

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1. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
 2. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
 3. Whether sealants filled joint cavities and are free from voids.
 4. Whether sealant dimensions and configurations comply with specified requirements.
- D. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
- E. Repair sealants pulled from test area by applying new sealants following same procedures used to originally seal joints. Ensure that original sealant surfaces are clean and new sealant contacts original sealant.
- F. Evaluation of Field-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements, will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.07 CLEANING:

- A. Fresh compound accidentally smeared on adjoining surfaces: Scrape off immediately and rub clean with a solvent as recommended by the caulking or sealant manufacturer.
- B. After filling and finishing joints, remove masking tape.
- C. Leave adjacent surfaces in a clean and unstained condition.

3.08 LOCATIONS:

- A. Exterior Building Joints, Horizontal and Vertical:
 1. Metal to Masonry or Stone: Type S-1
- B. Metal Reglets and Flashings:
 1. Flashings to Wall: Type S-6
 2. Metal to Metal: Type S-6
- C. Sanitary Joints:

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1. Walls to Plumbing Fixtures: Type S-9
 2. Counter Tops to Walls: Type S-9
 3. Pipe Penetrations: Type S-9
- D. High Temperature Joints over 204 degrees C (400 degrees F):
1. Exhaust Pipes, Flues, Breech Stacks: Type S-7 or S-8
- E. Interior Caulking:
1. Typical Narrow Joint 6 mm, (1/4 inch) or less at Walls and Adjacent Components: Types C-1, C-2 and C-3.
 2. Perimeter of Doors, Windows, Access Panels which Adjoin Concrete or Masonry Surfaces: Types C-1, C-2 and C-3.
 3. Joints at Masonry Walls and Columns, Piers, Concrete Walls or Exterior Walls: Types C-1, C-2 and C-3.
 4. Exposed Isolation Joints at Top of Full Height Walls: Types C-1, C-2 and C-3.
 5. Exposed Acoustical Joint at Sound Rated Partitions Type C-2.
 6. Concealed Acoustic Sealant Type S-4, C-1, C-2 and C-3.

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. Section Includes:
 - 1. Steel doors and frames.
 - 2. Preparation for door hardware.

1.02 RELATED WORK:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Related Sections:
 - 1. Division 01 Section "General Requirements."
 - 2. Division 01 Section "Special Procedures."
 - 3. Division 04 Section "Concrete Unit Masonry" for grouting and filling of frames.
 - 4. Division 08 Section "Hardware."
- C. Products supplied but not installed under this section.
 - 1. Division 04 Section "Concrete Unit Masonry" for frame anchors.

1.03 REFERENCES:

- A. General:
 - 1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
 - 2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
 - 3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.
- B. ASTM International:

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1. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 2. ASTM C1363 Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.
 3. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- C. California Building Code (CBC) Standard 7-2: Fire Tests of Door Assemblies
- D. HMMA 850: Fire Rated Hollow Metal Doors and Frames.
- E. HMMA 861: Guide Specifications for Commercial Hollow Metal Doors and Frames.
- F. National Association of Architectural Metal Manufacturers (NAAMM) Standard Hollow Metal Manufacturers' Association (HMMA) 840: Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames.
- G. National Fire Protection Association (NFPA) 80: Fire Doors and Windows.
- H. NFPA Standard 252: Fire Tests for Door Assemblies.
- I. Underwriters Laboratories (UL) Standard 10B: Fire Tests of Door Assemblies.
- J. UL Standard 10C: Positive Pressure Fire Tests of Door Assemblies.
- K. Standard Specifications for Public Works Construction "The Greenbook" (2015 Edition) including 2015 San Diego Regional Supplement, 2017 City of Chula Vista Supplement, and 2018 Supplement by DeLorenzo International.

1.04 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. Product Data: Manufacturer's product literature, specifications and installation instructions.
- C. Shop Drawings: Indicate door and frame elevations, dimensions, fire rating, door type, core, reinforcement, finish, hardware locations, cutout locations, frame profiles, details, metal gage, anchorage details, and finish.
- D. Schedule: Schedule of doors and frames, using same reference numbers for details and openings as those on Drawings. Indicate frame and door types.

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1.05 QUALITY ASSURANCE:

- A. Comply with HMMA 840 and 861.
- B. Regulatory Requirements:
 - 1. Comply with California Building Code (CBC) Chapters 7 and 10.
 - 2. Fire Labeled Doors and Frames: Comply with the following:
 - a. HMMA 850, NFPA 252, CBC Standard 7-2, and UL 10B and 10C.
 - b. Exit Enclosure Doors: Rate of rise across door thickness after 30 minutes: Maximum 450 degrees F.
 - c. Installed Door and Frame Assemblies: NFPA 80.

1.06 DELIVERY, STORAGE AND HANDLING:

- A. Deliver, store and handle steel doors and frames in a manner to prevent damage and deterioration.
- B. Storage: Comply with HMMA 840 and manufacturer's recommendations.

1.07 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MANUFACTURERS:

- A. Typical: Ceco Door Products, Forderer Cornice Works, Fenestra Corporation, or Steelcraft Ingersoll-Rand, or approved equal.

2.02 MATERIALS:

- A. Doors: HMMA 861 Type A, 1-3/4" thick, full flush continuously welded edge seams with no visible seams on faces or vertical edges, steel stiffened core, insulated with inorganic, noncombustible material.
 - 1. Exterior Doors: ASTM A653 hot-dip galvanized sheet steel, 16 gage (0.0538 inches minimum) unless otherwise noted.
 - 2. Interior Doors: 18 gage sheet steel (0.0428 inches minimum) unless otherwise noted.

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B. Frames: HMMA 861.

1. Exterior Frames: Welded type.
2. Interior Frames: [Welded type.] [Knock down type.]
3. Gage: Minimum 16 gage for openings 4 feet (1.2 m) in width or less; 14 gage for openings greater than 4 feet (1.2 m) in width.
4. Door Silencers: Resilient type, fitted in drilled holes, removable for replacement.
5. Mortar Guard Boxes: Minimum 22 gage, welded in place; provide where frames may be grouted.

C. Fire Rated Doors, Frames:

1. Labels: UL or Warnock-Hersey labels for the exposures indicated.
 - a. Items provided with labels other than the fire resistive rating shown on the Door Schedule are not permitted and will be rejected.
 - b. If any item noted to be fire rated cannot qualify for appropriate labeling, obtain instructions from the Project Manager before beginning fabrication on that item.
 - c. All Fire Rated Doors shall be pre-cored on the hinge side, 3/8" diameter to the lock for installation of access control device. The center hinge must match center-to-center for transfer installation at the core.

2.03 FABRICATION:

A. Conform to requirements of NAAMM, except as specified otherwise in this Section.

B. Hardware Preparation: Reinforce and prepare doors and frames to receive hardware furnished under Division 08 Section "Hardware".

1. Minimum Gages for Hardware Reinforcing Plates: Provide in accordance with HMMA 861, except hinge and pivot reinforcements shall be 7 gage minimum.
2. Locations for Reinforcing Hardware: Comply with Division 08 Section "Hardware".
3. Consult with Glenn Skipper, ext. 6125, and Pat DuPont, ext. 7668, on the following paragraph. Omit par. if not applicable.

C. Frames:

1. Welded Frames: Accurately form and cut mitered corners of welded type frames. Weld on inside surfaces. Grind welded joints to smooth uniform finish.

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2. Knocked Down Frames: Accurately form and miter interlocking joints of knocked down frames to maintain hairline alignment of parts when field assembled.
 3. Head Reinforcement: Reinforce frames wider than 4'-0" with two 12 gage minimum formed steel channels welded in place, flush with top of frames.
 4. Door Silencers:
 - a. Prepare frames for silencers.
 - b. Provide 3 silencers on strike jamb of single door frames [and 3 silencers each strike jamb of double door frames with removable mullions. Provide 2 silencers on head of double door frames without removable mullions. Omit silencers at gaskets.
 5. Jamb Anchors: Provide per HMMA. Weld floor jamb anchors in place.
- D. Fire Rated Labels: Place where visible when doors and frames are in open, installed position.
- E. Finish: Comply with requirements of Division 09 Section "Painting" - for primer, including application and compatibility with specified finishes.
1. Interior Units: Chemically treat surfaces and apply one coat of primer.
 2. Exterior Units: Hot-dipped galvanized in compliance with ASTM A623. Phosphatize or surface treat and apply one coat of primer.
 3. Primer: Rust-inhibitive, baked, smooth finish.

PART 3 – EXECUTION

3.01 COORDINATION:

- A. Coordinate door and frame fabrication and installation with Division 08 Section "Hardware",
- B. Coordinate setting of steel frames and anchor placement with wall construction.

3.02 INSTALLATION:

- A. Install doors and frames in accordance with HMMA 840 and with manufacturer's recommendations and instructions.
- B. In addition, install fire-rated doors and frames in accordance with NFPA 80 and the manufacturer's fire test report installation data.
- C. Remove and replace doors and frames damaged during delivery, storage, installation and construction.
 1. Paste filler repair is not permitted.

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2. Touch up scratched paint surfaces after installation.
- D. Protection: Protect metal surfaces after installation. At Substantial Completion, doors and frames shall be without indication of use, deterioration, or damage.

END OF SECTION

SECTION 08 62 23
TUBULAR SKYLIGHTS

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. Tubular daylighting devices and accessories.

1.02 RELATED WORK:

- A. Section 07600 [07 60 00] – Flashing and Sheet Metal: Metal curb flashings.

1.03 REFERENCES:

- A. California State OSHA Fall Protection Code of Regulations, Title 8, Section 3212 (e)(1).

1.04 SUBMITTALS:

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Data sheets showing roof dome assembly, flashing base, reflective tubes, diffuser assembly, and accessories.
 - 4. Installation requirements.
- C. Shop Drawings. Submit shop drawings showing layout, profiles and product components, including rough opening and framing dimensions, anchorage, roof flashings and accessories.
- D. Electrical wiring diagrams and recommendations for power and control wiring.
- E. Verification Samples: As requested by Architect.
- F. Test Reports: Independent testing agency or evaluation service reports verifying compliance with specified performance requirements.
- G. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
 - 1. List of Daylight Credits available for the products specified.

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2. Data on Energy Optimization Performance Credits for the products specified.
3. Data on Perimeter and Non-Perimeter Controllability of Systems for use of Daylight Dimmer option with the products specified.
4. Data on potential Innovation in Design Credits which may be available for the innovative use of the products specified.

1.05 QUALITY ASSURANCE:

- A. Manufacturer Qualifications: Engaged in manufacture of tubular daylighting devices for minimum 20 years.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver products in manufacturer's original containers, dry, undamaged, seals and labels intact.
- B. Store products in manufacturer's unopened packaging until ready for installation.

1.07 WARRANTY:

- A. Daylighting Device: Manufacturer's standard warranty for 10 years.
- B. Electrical Parts: Manufacturer's standard warranty for 5 years, unless otherwise indicated.

1.08 PROJECT CONDITIONS:

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 22 00 - Unit Prices for measurement and payment.
- C. Bid Schedule line item numbers covered by the section include but are not limited to:
 1. 354,380

PART 2 – PRODUCTS

2.01 MANUFACTURERS:

- A. Acceptable Manufacturer: Solatube International, Inc.; 2210 Oak Ridge Way, Vista, CA 92081. Tel. Toll Free: 888-765-2882. Tel: (760) 477-1120. Fax: (760) 597-4488. Email: commsales@solatube.com. Web: www.solatube.com.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 DESIGN CRITERIA:

- A. Daylight Reflective Tubes: Spectralight Infinity with INFRAREDuction Technology combines ultra-high Visible Light reflectance with Ultra-low Infrared (IR) reflectance. Patented spectrally-selective optical surface yields an average total- and specular-reflectance greater than 99.5% percent for the Visible Light spectrum (400 nm to 700 nm) providing maximized visible light transmission and less than 25% reflectance for Infrared (IR) heat wavelengths (750 nm to 2500 nm) for minimized heat transmission, resulting in a spectrally-selective Total Solar Spectrum (250 nm to 2500 nm) reflectance less than 37 percent, as measured using a Perkin Elmer Lambda 1050 spectrophotometer with a Universal Reflectance Accessory. Color: a* and b* (defined by CIE L*a*b* color model) shall not exceed plus 2 or be less than minus 2 as determined in accordance to ASTM E 308.
- B. SOLAMASTER 330 DS-O / 330 DS-C (OPEN/CLOSED CEILING)
 - 1. AAMA/WDMA/CSA 101/IS2/A440, Class CW-PG80, size tested 21-inch (533 mm) diameter, Type TDDOC and Type TDDCC.
 - a. Air Infiltration Test:
 - 1) Air infiltration will not exceed 0.30 cfm/sf aperture with a pressure delta of 1.57 psf across the tube when tested in accordance with ASTM E 283.
 - b. Water Resistance Test:
 - 1) Passes water resistance; no uncontrolled water leakage with a pressure differential of 10.7 psf (512 Pa) or 15 percent of the design load (whichever is greater) and a water spray rate of 5 gallons/hour/sf for 24 minutes when tested in accordance with ICC-ES AC-16, ASTM E 547 and ASTM E 331.
 - c. Uniform Load Test: All units tested with a safety factor of (3) for positive pressure and (2) for negative pressure, acting normal to plane of roof in accordance with ASTM E 330.

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- 1) No breakage, permanent damage to fasteners, hardware parts, or damage to make daylighting system inoperable or cause excessive permanent deflection of any section when tested at a Positive Load of 150 psf (7.18 kPa) or Negative Load of 70 psf (3.35 kPa).
2. Fire Testing:
 - a. Fire Rated Roof Assemblies:
 - 1) When used with the Dome Edge Protection Band, all domes meet fire rating requirements as described in the International Building Code for Class A, B, and C roof assemblies.
 - b. Self-Ignition Temperature - Greater than 650 degrees F per ASTM D-1929.
 - c. Smoke Density: Rating no greater than 450 per ASTM E 84 in way intended for use. Classification C.
 - d. Rate of Burn and/or Extent: Maximum Burning Rate: 2.5 inches/min (62 mm/min) Classification CC-2 per ASTM D 635.
 - e. Rate of Burn and/or Extent: Maximum Burn Extent: 1-inch (25 mm) Classification CC-1 per ASTM D 635.
3. FM Certification:
 - a. Spread of Flame: Passes: Class A at 5 in12. No flame spread when tested in accordance with FM modified version of ASTM E108 Fire Test of Roof Coverings.
 - b. Simulated Hail Resistance (Pre UV Exposure): Passes: No cracking or breaks when tested with nominal 2.0 in. (51 mm) diameter ice ball having a kinetic energy of 26.8 ft-lbs (36.4J)
 - c. Simulated Hail Resistance (Post UV Exposure): Passes: No cracking or breaks when tested with nominal 2.0 in. (51 mm) diameter ice ball having a kinetic energy of 26.8 ft-lbs (36.4J) after no less than 1000 hours of ultraviolet (UV) light exposure.
 - d. Simulated Impact: Passes: No breakage or through openings when a 100 lb (45.5 kg) weight dropped from 4 ft (1.2 m) above highest point of test sample.
 - e. Simulated Wind Uplift: Passes: 195 psf Wind Rating. No separation, breaking or cracking occurred when tested in accordance with FM 4431.
4. Fall Protection Performance:
 - a. Passes fall protection test: No penetration of dome or curb cap when subject to 400 lb (160 Kg)/42 inch (1066 mm) impact drop test when tested in accordance with OSHA 29 CFR 1926.506(c) Safety Net Systems.
 - b. Passes fall protection test: California State OSHA Fall Protection Code of Regulations, Title 8, Section 3212 (e)(1) Skylight Screens.

2.03 TUBULAR DAYLIGHTING DEVICES:

- A. Tubular Daylighting Devices General: Transparent roof-mounted skylight dome and self-flashing curb, reflective tube, and ceiling level diffuser assembly, transferring sunlight to interior spaces; complying with ICC AC-16.
- B. SolaMaster Series: Solatube Model 330 DS, 21 inch (530 mm) Daylighting System:
 - 1. Model:
 - a. Solatube Model 330 DS-O Open Ceiling. AAMA Type TDDOC.
 - 2. Capture Zone:
 - a. Roof Dome Assembly: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
 - 1) Dome Glazing: Type DA, 0.143 inch (3.7 mm) minimum thickness injection molded acrylic classified as CC2 material; UV inhibiting (100 percent UV C, 100 percent UV B and 98.5 percent UV A), impact modified acrylic blend.
 - 2) Dome Glazing: Type DP, 0.115 inch (3 mm) minimum thickness polycarbonate classified as CC1 material.
 - 3) Tube Ring: Attached to top of base section; 0.090 inch (2.3 mm) nominal thickness injection molded high impact PVC; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing. Attached to the base of the dome ring using butyl glazing rope 0.24 inch (6 mm) diameter; to minimize air infiltration.
 - 4) Dome Seal: Adhesive backed weatherstrip, 0.63 inch (16 mm) tall by 0.28 inch (7 mm) wide.
 - 5) LightTracker Reflector, made of aluminum sheet, thickness 0.015 inch (0.4 mm) with Spectralight Infinity. Positioned in the dome to capture low angle sunlight.
 - b. Dome Options:
 - 1) Security Kit: Type SK Dome Security Kit, rivets with nylon spacers to replace dome screws.
 - 2) Secondary Diffuser: Type SS, Acrylic plastic classified as CC2 material. Thickness shall not be less than 0.100 inches.
 - c. Flashings:
 - 1) Roof Flashing Base:
 - a) One Piece: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube. Sheet steel, corrosion resistant conforming to ASTM A 653/A 653M or ASTM A 463/A 463M or ASTM

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A792/A 792M, 0.028 inch (0.7 mm) plus or minus .006 inch (.015 mm) thick.

- (1) Base Style: Type F4, Self Mounted, 4 inches (102 mm) high.
 - (2) Base Style: Type F8, Self Mounted, 8 inches (203 mm) high.
 - (3) Base Style: Type F11, Self Mounted, 11 inches (279 mm) high.
 - (4) Base Style: Type FC, Curb cap, with inside dimensions of 27 inches by 27 inches (685 mm by 685 mm) to cover curb as specified in Section 07600.
- b) Two Piece: Type FSM, two-piece, inverted flange Metal Roof Flashing for Standing Seam Rib roof profile with greater than 14-3/8 inch (365 mm) minimum distance between ribs permitting a required greater than 2 inch (51 mm) clearance between flashing and rib: Aluminum 1060 Alloy, corrosion resistant conforming to ASTM B 209, 0.059 inch (1.5 mm) thick.

3. Delivery Zone:

- a. Diffuser Assemblies for Tubes Not Penetrating Ceilings (Open Ceiling): Solatube Model 330 DS-O. 21 inch (530 mm) diameter diffuser attached directly to bottom of tube.
 - 1) Lens: Type L1 OptiView Fresnel lens design to maximize light output and diffusion. Visible Light Transmission shall be greater than 90 percent at 0.022 inch (0.6 mm) thick. Classified as CC2.
 - 2) Lens: Type L2, Prismatic lens designed to maximize light output and diffusion. Visible Light Transmission shall be greater than 90 percent at 0.100 inch (2.5 mm) thick. Classified as CC2.
 - 3) Diffuser Seal: Open cell foam, acrylic adhesive backed, 0.75 inch (19 mm) wide by 0.125 inch (3.2 mm) thick to minimize condensation and bug, dirt and air infiltration per ASTM E 283.
 - 4) Diffuser Trim Ring: Injection molded acrylic. Nominal wall thickness 0.172 inches (4.4 mm).

2.04 ACCESSORIES:

- A. Fasteners: Same material as metals being fastened, non-magnetic steel, non-corrosive metal of type recommended by manufacturer, or injection molded nylon.

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- B. Suspension Wire: Steel, annealed, galvanized finish, size and type for application and ceiling system requirement.
- C. Sealant: Polyurethane or copolymer based elastomeric sealant as provided or recommended by manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION:

- A. Do not begin installation until substrates have been properly prepared.
- B. Examine openings, substrates, structural support, anchorage, and conditions for compliance with requirements for installation tolerances and other conditions.
- C. If substrate and rough opening preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION:

- A. Clean surfaces thoroughly prior to installation.
- B. Coordinate requirements for power supply, conduit and wiring.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION:

- A. Install in accordance with manufacturer's printed instructions.
- B. Coordinate installation with substrates, air and vapor retarders, roof insulation, roofing membrane, and flashing to ensure that each element of the Work performs properly and that finished installation is weather tight.
 - 1. Install flashing to produce weatherproof seal with curb and overlap with roofing system termination at top of curb.
 - 2. Provide thermal isolation when components penetrate or disrupt building insulation. Pack fibrous insulation in rough opening to maintain continuity of thermal barriers.
 - 3. Coordinate attachment and seal of perimeter air and vapor barrier material.
- C. Where metal surfaces of tubular unit skylights will contact incompatible metal or corrosive substrates, including preservative-treated wood, provide permanent separation as recommended by manufacturer

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- D. Align device free of warp or twist, maintain dimensional tolerances.
- E. After installation of first unit, field test to determine adequacy of installation. Conduct water test in presence of Owner, Architect, or Contractor, or their designated representative. Correct if needed before proceeding with installation of subsequent units.
- F. Inspect installation to verify secure and proper mounting. Test each fixture to verify operation, control functions, and performance. Correct deficiencies.

3.04 CLEANING:

- A. Clean exposed surfaces according to manufacturer's written instructions. Touch up damaged metal coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

3.05 PROTECTION:

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08 63 00
METAL-FRAMED SKYLIGHTS

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

A. Related Documents:

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
2. Standard Specifications for Public Works Construction “The Greenbook” (2015 Edition) including 2015 San Diego Regional Supplement, 2017 City of Chula Vista Supplement, and 2018 Supplement by DeLorenzo International.

B. Section includes skylights with metal framing.

C. Related Sections:

1. Section 07600 "Flashing and Sheet Metal"

1.02 SUBMITTALS:

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for metal-framed skylights.

B. Shop Drawings: For metal-framed skylights. Include plans, elevations, sections, details, and attachments to other work.

1. Include details of provisions for assembly expansion and contraction and for draining moisture within the assembly to the exterior.
2. Include full-size isometric details of each vertical-to-horizontal intersection of assembly, showing the following:
 - a. Joinery including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.
3. Include laboratory mockup Shop Drawings, prepared by a qualified preconstruction testing agency, showing details of laboratory mockup.
 - a. Resubmit Shop Drawings with changes made to details of mockup to successfully complete preconstruction testing.

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- C. Preconstruction Test Reports: Prepared by a qualified preconstruction testing agency.
- D. Compatibility and Adhesion Test Reports: For structural-sealant-glazed skylights, test reports from sealant manufacturer indicating that joint sealants have been tested for each material that will come in contact with sealants.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for metal-framed skylights.
- F. Warranties: Sample of special warranties.

1.03 QUALITY ASSURANCE:

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of metal-framed skylights required for this Project.
- B. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for skylights' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including testing conducted by an independent testing agency and in-service performance.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
- E. Structural-Sealant Glazing: Comply with recommendations in ASTM C 1401, "Guide for Structural Sealant Glazing," for joint design and quality-control procedures.
 - 1. Joint designs are reviewed and approved by structural-sealant manufacturer.
 - 2. Quality-control program development and reporting comply with ASTM C 1401 recommendations for material qualification procedures, preconstruction sealant-testing program, and procedures and intervals for fabrication and installation reviews and checks.

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3. Perform manufacturer's standard tests for compatibility and adhesion of sealants with each material that will come in contact with sealants.
- F. Provide metal-framed skylights that comply with test-performance requirements indicated, as evidenced by reports of tests performed on manufacturer's standard assemblies by a qualified independent testing agency.
 1. Preconstruction Testing Sequence: Laboratory testing showing similar product according to AAMA 501, using the following sequence of tests:
 - a. Structural-performance preloading at one-half of the specified maximum test load (ASTM E 330).
 - b. Air infiltration (ASTM E 283).
 - c. Water penetration under static pressure (ASTM E 331).
 - d. Water penetration under dynamic pressure (AAMA 501.1).
 - e. Structural performance at design load (ASTM E 330).
 - f. Repeat air filtration (ASTM E 283).
 - g. Repeat water penetration under static pressure (ASTM E 331).
 - h. Structural performance at specified maximum test load (ASTM E 330).

1.04 WARRANTY:

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal-framed skylights that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration caused by thermal movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Adhesive or cohesive sealant failures.
 - e. Water leakage.
 2. Warranty Period: Five years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
 1. Failures include, but are not limited to, checking, crazing, peeling, chalking, and fading of finishes.
 2. Warranty Period: Five years from date of Substantial Completion.

1.05 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.

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- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MANUFACTURERS:

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Bristolite Daylighting Systems, Inc.; Custom or Standard Metal Framed Skylight or approved equal:

2.02 PERFORMANCE REQUIREMENTS:

- A. General: Metal-framed skylights shall withstand the effects of the following without failure due to defective manufacture, fabrication, installation, or other defects in construction:
1. Structural loads.
 2. Thermal movements.
 3. Movements of supporting structure.
 4. Dimensional tolerances of support system and other adjacent construction.
 5. Failure includes, but is not limited to, the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferring to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
 - d. Glazing-to-glazing contact.
 - e. Noise or vibration created by wind and by thermal and structural movements.
 - f. Loosening or weakening of fasteners, attachments, and other components.
 - g. Sealant failure.
- B. Delegated Design: Design metal-framed skylights, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Structural Loads:
1. Wind Loads: as required by local code and governing agencies
 2. Seismic Loads: As required by local code and governing agencies
- D. Structural-Test Performance: Provide metal-framed skylights tested according to ASTM E 330.

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- E. Water Penetration under Static Pressure: Provide metal-framed skylights that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa)
- F. Water Penetration under Dynamic Pressure: Provide metal-framed skylights that do not evidence water leakage through fixed glazing and framing areas when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
- G. Thermal Movements: Provide metal-framed skylights that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
- H. Condensation Resistance: Provide metal-framed skylights with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 45 when tested according to AAMA 1503.
- I. Structural Sealant: Capable of withstanding tensile and shear stresses imposed without failing adhesively or cohesively. When tested for preconstruction adhesion and compatibility, cohesive failure of sealant shall occur before adhesive failure.
- J. Energy Performance: Provide metal-framed skylights with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below and certified and labeled according to NFRC:
 - 1. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.6 as determined according to NFRC 200.

2.03 FRAMING SYSTEMS:

- A. Aluminum: Alloy and temper recommended in writing by manufacturer for type of use and finish indicated.
 - 1. Sheet and Plate: ASTM B 209
 - 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221
 - 3. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
 - 4. Structural Profiles: ASTM B 308/B 308M.
 - 5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

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- B. Pressure Caps: Manufacturer's standard aluminum components that mechanically retain glazing.
 - 1. Include snap-on aluminum trim that conceals fasteners.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning skylight components.
- D. Fasteners and Accessories: Manufacturer's standard, corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. At pressure caps, use ASTM A 193/A 193M stainless-steel screws.
 - 2. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 - 3. Reinforce members as required to receive fastener threads.
 - 4. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- E. Exposed Flashing and Closures: Manufacturer's standard aluminum components not less than 0.040 inch (1.016 mm) thick.
- F. Framing Gaskets: Manufacturer's standard.
- G. Framing Sealants: As recommended in writing by manufacturer.
 - 1. Sealants used inside the weatherproofing system shall have a VOC content not to exceed the requirements of the CBC Green Code.
 - 2. Sealants used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.04 GLAZING:

- A. Glazing: Shall be a Manufacturer's standard glazing qualified to meet the requirements as noted within and approved by Project Administrator.
- B. Spacers, Setting Blocks, and Gaskets: Manufacturer's standard elastomeric types.
- C. Bond-Breaker Tape: Manufacturer's standard tetrafluoroethylene-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

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- D. Glazing Sealants: As recommended in writing by manufacturer and qualify for compatibility for structural requirements and meet the requirements for VOC, CBC Green Code.

2.05 FABRICATION:

- A. Where practical, fit and assemble metal-framed skylights in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.06 ALUMINUM FINISHES:

- A. Finish and color shall be similar to roof material. Shop drawings and samples shall be submitted for approval.

2.07 SOURCE QUALITY CONTROL:

- A. Structural-Sealant Glazing: Perform quality-control procedures complying with ASTM C 1401 recommendations including, but not limited to, material qualification procedures, sealant testing, and fabrication reviews and checks.

PART 3 – EXECUTION

3.01 EXAMINATION:

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION:

- A. General:
 - 1. Comply with manufacturer's written instructions.
 - 2. Do not install damaged components.
 - 3. Fit joints between aluminum components to produce hairline joints free of burrs and distortion.
 - 4. Rigidly secure nonmovement joints.
 - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

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- 6. Weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
- 7. Seal joints watertight unless otherwise indicated.
- B. Metal Protection: Where aluminum will contact dissimilar materials, protect against galvanic action by painting contact surfaces with protective coating or by installing nonconductive spacers as recommended in writing by manufacturer for this purpose.
- C. Install continuous aluminum sill closure with weatherproof expansion joints and locked and sealed or welded corners. Locate weep holes at rafters.
- D. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within skylight to exterior.
- E. Install components plumb and true in alignment with established lines and elevations.

3.03 FIELD QUALITY CONTROL:

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections for water penetration testing and quality control of installed product.
- B. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

END OF SECTION

**SECTION 08 71 00
DOOR HARDWARE**

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. Door hardware and related items necessary for complete installation and operation of doors.

1.02 RELATED WORK:

- A. Caulking: Section 07 92 00 JOINT SEALANTS.
- B. Application of Hardware: Section 08 11 00, HOLLOW METAL DOORS AND FRAMES

1.03 REFERENCES:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. In text, hardware items are referred to by series, types, etc., listed in such specifications and standards, except as otherwise specified.
- B. American Society for Testing and Materials (ASTM):
 - E2180-07 Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) In Polymeric or Hydrophobic Materials
- C. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):
 - A156.1-06 Butts and Hinges
 - A156.2-03 Bored and Pre-assembled Locks and Latches
 - A156.13-05 Mortise Locks and Latches Series 1000
 - A156.16-08 Auxiliary Hardware
 - A156.28-07 Master Keying Systems
 - A156.29-0 Exit Locks and Alarms
 - A250.8-03 Standard Steel Doors and Frames

1.04 GENERAL:

- A. All hardware shall comply with UFAS, (Uniform Federal Accessible Standards) unless specified otherwise.

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- B. Hardware for application on metal and frames shall be made to standard templates. Furnish templates to the fabricator of these items in sufficient time so as not to delay the construction.
- C. The following items shall be of the same manufacturer, if possible, except as otherwise specified:
 - 1. Mortise locksets.
 - 2. Hinges for hollow metal and wood doors.
 - 3. Surface applied overhead door closers.

1.05 SUBMITTALS:

- A. Samples and Manufacturers' Literature:
 - 1. Samples: All hardware items (proposed for the project) that have not been previously approved by Builders Hardware Manufacturers Association shall be submitted for approval. Tag and mark all items with manufacturer's name, catalog number and project number.
 - 2. Samples are not required for hardware listed in the specifications by manufacturer's catalog number, if the contractor proposes to use the manufacturer's product specified. Certificate of Compliance and Test Reports: Submit certificates that hardware conforms to the requirements specified herein. Certificates shall be accompanied by copies of reports as referenced. The testing shall have been conducted either in the manufacturer's plant and certified by an independent testing laboratory or conducted in an independent laboratory, within four years of submittal of reports for approval.

1.06 DELIVERY, STORAGE AND HANDLING:

- A. Deliver items of hardware to job site in their original containers, complete with necessary appurtenances including screws, keys, and instructions. Tag one of each different item of hardware and deliver to Resident Engineer for reference purposes. Tag shall identify items by Project Specification number and manufacturer's catalog number. These items shall remain on file in Resident Engineer's office until all other similar items have been installed in project, at which time the Resident Engineer will deliver items on file to Contractor for installation in predetermined locations on the project.

1.07 WARRANTY:

- A. Warranty period shall be two years in lieu of one year for all items except as noted below:
 - 1. Locks, 5 years.

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1.08 PRE - INSTALLATION MEETING:

- A. Convene a pre-installation meeting not less than 30 days before start of installation of door hardware. Require attendance of parties directly affecting work of this section, including Contractor and Installer, Architect, Project Engineer and VA Locksmith, Hardware Consultant, and Hardware Manufacturer's Representative. Review the following:
 - 1. Inspection of door hardware.
 - 2. Job and surface readiness.
 - 3. Coordination with other work.
 - 4. Protection of hardware surfaces.
 - 5. Substrate surface protection.
 - 6. Installation.
 - 7. Adjusting.
 - 8. Repair.
 - 9. Field quality control.
 - 10. Cleaning.

1.09 INSTRUCTIONS:

- A. Hardware Set Symbols on Drawings: Except for protective plates, door stops, mutes, thresholds and the like specified herein, hardware requirements for each door are indicated on drawings by symbols. Symbols for hardware sets consist of letters (e.g., "HW") followed by a number. Each number designates a set of hardware items applicable to a door type.
- B. Manufacturers' Catalog Number References: Where manufacturers' products are specified herein, products of other manufacturers which are considered equivalent to those specified may be used.
- C. Keying: All cylinders shall be keyed into existing Best Great Grand Master Key System. Provide removable core cylinders that are removable only with a special key or tool without disassembly of knob or lockset. Cylinders shall be 7-pin type. Keying information shall be furnished at a later date by the Resident Engineer.

1.10 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 BUTT HINGES:

- A. ANSI A156.1. Provide only three-knuckle hinges, except five-knuckle where the required hinge type is not available in a three-knuckle version (e.g., some types of swing-clear hinges). The following types of butt hinges shall be used for the types of doors listed, except where otherwise specified:

1. Exterior Doors: Type A2112/A5112 for doors 3 feet wide or less and Type A2111/A5111 for doors over 3 feet wide. Hinges for exterior outswing doors shall have non-removable pins. Hinges for exterior fire-rated doors shall be of stainless steel material.

Interior Doors: Type A8112/A5112 for doors 3 feet wide or less and Type A8111/A5111 for doors over 3 feet wide. Hinges for doors exposed to high humidity areas (shower rooms, toilet rooms, kitchens, janitor rooms, etc. shall be of stainless steel material.

- B. Provide quantity and size of hinges per door leaf as follows:

1. Doors up to 4 feet high: 2 hinges.
2. Doors 4 feet to 7 feet 5 inches high: 3 hinges minimum.

2.02 DOOR STOPS:

- A. Conform to ANSI A156.16.
- B. Provide stop Type L02011, as applicable for exterior doors. At outswing doors where stop can be installed in concrete, provide stop mated to concrete anchor set in 3- inch core-drilled hole and filled with quick-setting cement.
- C. Conform to ANSI Standard A156.16. Provide extension strikes for Types L01301 and L01311 holders where necessary.

2.03 LOCKS AND LATCHES:

- A. Conform to ANSI A156.2. Locks and latches for doors 1-3/4-inch-thick or over shall have beveled fronts. Lock cylinders shall have not less than seven pins. Cylinders for all locksets shall be small format removable core type. Cylinders shall be furnished with construction removable cores and construction master keys. Cylinder shall be removable by special key or tool. Construct all cores so that they will be interchangeable into the core housings of all mortise locks, rim locks, cylindrical locks, and any other type lock included in the Great Grand Master Key System. Disassembly of lever or lockset shall not be required to remove core from lockset. All locksets or latches on double doors with fire label shall have latch bolt with 3/4-inch

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throw, unless shorter throw allowed by the door manufacturer's fire label. Provide temporary keying device or construction core of allow opening and closing during construction and prior to the installation of final cores.

- B. In addition to above requirements, locks and latches shall comply with following requirements:
 - 1. Mortise Lock and Latch Sets: Conform to ANSI/BHMA A156.13. Mortise locksets shall be series 1000, minimum Grade 2. All locksets and latchsets, except on designated doors in Psychiatric (Mental Health) areas, shall have lever handles fabricated from cast stainless steel. Provide sectional (lever x rose) lever design matching Sargent LNL. No substitute lever material shall be accepted. All locks and latchsets shall be furnished with 4-7/8-inch curved lip strike and wrought box. At outswing pairs with overlapping astragals, provide flat lip strip with 7/8-inch lip-to-center dimension. Lock function F02 shall be furnished with emergency tools/keys for emergency entrance. All lock cases installed on lead lined doors shall be lead lined before applying final hardware finish. Furnish armored fronts for all mortise locks. Where mortise locks are installed in high-humidity locations or where exposed to the exterior on both sides of the opening, provide non-ferrous mortise lock case.
 - 2. Cylindrical Lock and Latch Sets: levers shall meet ADA (Americans with Disabilities Act) requirements. Cylindrical locksets shall be series 4000 Grade I. All locks and latchsets shall be furnished with 4-7/8-inch curved lip strike and wrought box. At outswing pairs with overlapping astragals, provide flat lip strip with 7/8-inch lip-to-center dimension. Provide lever design to match design selected by Architect or to match existing lever design.
 - 3. Auxiliary locks shall be as specified under hardware sets and conform to ANSI A156.5. ADA Accessibility Guidelines. Match lever handles of locks and latchsets on adjacent doors.
- C. Special Features: Key override to permit a master keyed security system and a pushbutton security code activated passage feature to allow access without using the entry code.

2.04 KEYS:

- A. Refer to owner for key requirements.

2.05 ARMOR PLATES, KICK PLATES, MOP PLATES AND DOOR EDGING:

- A. Conform to ANSI Standard A156.6.
- B. Provide protective plates and door edging as specified below:

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1. Kick plates, mop plates and armor plates of metal, Type J100 series.
2. Provide kick plates and mop plates where specified. Kick plates shall be 254 mm (10 inches) or 305 mm (12 inches) high. Mop plates shall be 152 mm (6 inches) high. Both kick and mop plates shall be minimum 1.27 mm (0.050 inches) thick. Provide kick and mop plates beveled on all 4 edges (B4E). On push side of doors where jamb stop extends to floor, make kick plates 38 mm (1-1/2 inches) less than width of door, except pairs of metal doors which shall have plates 25 mm (1 inch) less than width of each door. Extend all other kick and mop plates to within 6 mm (1/4 inch) of each edge of doors. Kick and mop plates shall butt astragals. For jamb stop requirements, see specification sections pertaining to door frames.
3. Kick plates and/or mop plates are not required on following door sides:
 - a. Armor plate side of doors;
 - b. Exterior side of exterior doors;
 - c. Closet side of closet doors;
 - d. Both sides of aluminum entrance doors.
4. Armor plates for doors are listed under Article "Hardware Sets". Armor plates shall be thickness as noted in the hardware set, 875 mm (35 inches) high and 38 mm (1-1/2 inches) less than width of doors, except on pairs of metal doors. Provide armor plates beveled on all 4 edges (B4E). Plates on pairs of metal doors shall be 25 mm (1 inch) less than width of each door. Where top of intermediate rail of door is less than 875 mm (35 inches) from door bottom, extend armor plates to within 13 mm (1/2 inch) of top of intermediate rail. On doors equipped with panic devices, extend armor plates to within 13 mm (1/2 inch) of panic bolt push bar.
5. Where louver or grille occurs in lower portion of doors, substitute stretcher plate and kick plate in place of armor plate. Size of stretcher plate and kick plate shall be 254 mm (10 inches) high.
6. Provide stainless steel edge guards where so specified at wood doors. Provide mortised type instead of surface type except where door construction and/or ratings will not allow. Provide edge guards of bevel and thickness to match wood door. Provide edge guards with factory cut-outs for door hardware that must be installed through or extend through the edge guard. Provide full-height edge guards except where door rating does not allow; in such cases, provide edge guards to height of bottom of typical lockset armor front. Forward edge guards to wood door manufacturer for factory installation on doors.

2.06 FLUSH BOLTS (LEVER EXTENSION):

- A. Conform to ANSI A156.16. Flush bolts shall be Type L24081 unless otherwise specified. Furnish proper dustproof strikes conforming to ANSI A156.16, for flush bolts required on lower part of doors.

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- B. Lever extension manual flush bolts shall only be used at non-fire-rated pairs for rooms only accessed by maintenance personnel.
- C. Face plates for cylindrical strikes shall be rectangular and not less than 25 mm by 63 mm (1 inch by 2-1/2 inches).
- D. Friction-fit cylindrical dustproof strikes with circular face plate may be used only where metal thresholds occur.
- E. Provide extension rods for top bolt where door height exceeds 2184 mm (7 feet 2 inches)

2.07 DOOR PULLS:

- A. Conform to ANSI A156.6. Pull plate 90 mm by 350 mm (3-1/2 inches by 14 inches), unless otherwise specified. Cut plates of door pulls for cylinders or turn pieces where required.

2.08 PUSH PLATES:

- A. Conform to ANSI A156.6. Metal, Type J302, 200 mm (8 inches) wide by 350 mm (14 inches) high. Provide metal Type J300 plates 100 mm (4 inches wide by 350 mm (14 inches) high) where push plates are specified for doors with stiles less than 200 mm (8 inches) wide. Cut plates for cylinders and turn pieces where required.

2.09 COMBINATION PUSH AND PULL PLATES:

- A. Conform to ANSI 156.6. Type J303, stainless steel 3 mm (1/8 inch) thick, 80 mm (3-1/3 inches) wide by 800 mm (16 inches) high), top and bottom edges shall be rounded. Secure plates to wood doors with 38 mm (1-1/2 inch) long No. 12 wood screws. Cut plates for turn pieces, and cylinders where required. Pull shall be mounted down.

2.10 COORDINATORS:

- A. Conform to ANSI A156.16. Coordinators, when specified for fire doors, shall comply with Underwriters Laboratories, Inc., requirements for fire door hardware. Coordinator may be omitted on exterior pairs of doors where either door will close independently regardless of the position of the other door. Coordinator may be omitted on interior pairs of non-labeled open where open back strike is used. Open back strike shall not be used on labeled doors. Paint coordinators to match door frames, unless coordinators are plated. Provide bar type coordinators, except where gravity coordinators are required at acoustic pairs. For bar type coordinators, provide filler bars for full width and, as required, brackets for push-side surface mounted closers, overhead stops, and vertical rod panic strikes.

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2.11 MISCELLANEOUS HARDWARE:

- A. Access Doors (including Sheet Metal, Screen and Woven Wire Mesh Types): Except for fire-rated doors and doors to Temperature Control Cabinets, equip each single or double metal access door with Lock Type E76213, conforming to ANSI A156.5. Key locks as directed. Ship lock prepaid to the door manufacturer. Hinges shall be provided by door manufacturer.
- B. Cylinders for Various Partitions and Doors: Key cylinders same as entrance doors of area in which partitions and door occur, except as otherwise specified. Provide cylinders to operate locking devices where specified for following partitions and doors:
 - 1. ADA toilet partitions door.

2.12 FINISHES:

- A. Exposed surfaces of hardware shall have ANSI A156.18, finishes as specified below. Finishes on all hinges, pivots, closers, thresholds, etc., shall be as specified below under "Miscellaneous Finishes." For field painting (final coat) of ferrous hardware, see Section 09 91 00, PAINTING.
- B. Stainless Steel for all surfaces on exterior and interior of buildings, except where other finishes are specified or indicated on the drawings.
- C. Anti-microbial Coating: All hand-operated hardware (levers, pulls, push bars, push plates, paddles, and panic bars) shall be provided with an anti-microbial/anti-fungal coating that has passed ASTM E2180 tests. Coating to consist of ionic silver (Ag⁺). Silver ions surround bacterial cells, inhibiting growth of bacteria, mold, and mildew by blockading food and respiration supplies.

PART 3 – EXECUTION

3.01 HARDWARE HEIGHTS:

- A. For new buildings locate hardware on doors at heights specified below, with all hand-operated hardware centered within 864 mm (34 inches) to 1200 mm (48 inches), unless otherwise noted:
- B. Hardware Heights from Finished Floor:
 - 1. Locksets and latch sets centerline of strike 40-5/16 inches.
 - 2. Deadlocks centerline of strike 48 inches.
 - 3. Centerline of door pulls to be 40 inches.
 - 4. Push plates and push-pull shall be 50 inches to top of plate.
 - 5. Push-pull latch to be 40-5/16 inches to centerline of strike.

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6. Locate other hardware at standard commercial heights. Locate push and pull plates to prevent conflict with other hardware.

3.02 INSTALLATION:

- A. Install hardware in accordance with the manufactures instructions.

3.03 FINAL INSPECTION:

- A. Installer to provide letter to Project Engineer that upon completion, installer has visited the Project and has accomplished the following:
 1. Re-adjust hardware.
 2. Evaluate maintenance procedures and recommend changes or additions, and instruct VA personnel.
 3. Identify items that have deteriorated or failed.
 4. Submit written report identifying problems.

3.04 HARDWARE SETS:

- A. Refer to drawings, door hardware sets are shown on the drawings.

END OF SECTION

SECTION 08 91 00
LOUVERS

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. This section specifies fixed wall louvers.

1.02 REFERENCES:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. The Master Painters
Institute (MPI): Approved
Product List – September 2011
- C. American Society for Testing and Materials (ASTM):
- | | |
|-----------------------|--|
| A167-99(R2009) | Stainless and Heat-Resisting Chromium - Nickel Steel Plate, Sheet, and Strip |
| A1008/A1008M-10 | Steel, Sheet, Carbon, Cold Rolled, Structural, and High Strength Low-Alloy with Improved Formability |
| B209/B209M-03 (R2007) | Aluminum and Aluminum Alloy, Sheet and Plate |
| B221-08 | Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes |
| B221M-07 | Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire Shapes, and Tubes |
- D. National Association of Architectural Metal
Manufacturers (NAAMM): AMP 500-06 Metal Finishes Manual
- E. National Fire Protection Association (NFPA):
90A-09 Installation of Air Conditioning and Ventilating Systems
- F. American Architectural Manufacturers Association (AAMA):
- | | |
|---------|--|
| 2605-11 | High Performance Organic Coatings on Architectural Extrusions and Panels |
|---------|--|

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- G. Air Movement and Control Association, Inc. (AMCA): 500-L-07 Testing Louvers

1.03 SUBMITTALS:

- A. Submit for review and approval
- B. Manufacturer's Literature and Data: Each type of louver.

1.04 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MATERIALS:

- A. Aluminum, Extruded: ASTM B221/B221M.
- B. Aluminum, Plate and Sheet: ASTM B209/B209M.
- C. Fasteners: Fasteners for securing louvers vents to adjoining construction, except as otherwise specified or shown, shall be toggle or expansion bolts, of size and type as required for each specific type of installation and service condition.
 - 1. Where type, size, or spacing of fasteners is not shown or specified, submit shop drawings showing proposed fasteners, and method of installation.
 - 2. Fasteners for louvers, louver frames, and wire guards shall be of stainless steel or aluminum.
- D. Inorganic Zinc Primer: MPI No. 19.
- E. Fluoropolymer resin coatings (PVDF)

2.02 EXTERIOR WALL LOUVERS:

- A. General:
 - 1. Provide fixed type louvers of size and design shown on the drawings.
 - 2. Heads, sills and jamb sections shall have formed caulking slots or be designed to retain caulking. Head sections shall have exterior drip lip, and sill sections an integral water stop.

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3. Furnish louvers with sill extension or separate sill as indicated on drawings
4. Frame shall be mechanically fastened or welded construction with welds dressed smooth and flush.

B. Performance Characteristics:

1. Weather louvers shall have a minimum of 50 percent free area and shall pass 800 fpm free area velocity at a pressure drop not exceeding 0.10 inch water gage and carry not more than 0.01 ounces of water per square foot of free area for 15 minutes when tested per AMCA Standard 500-L.
2. Louvers shall bear AMCA certified rating seals for air performance and water penetration ratings.

C. Aluminum Louvers:

1. General: Frames, blades, sills and mullions (sliding interlocking type); 0.081- inch thick extruded aluminum. Blades shall be drainable type and have reinforcing bosses.
2. Louvers, fixed: Make frame sizes 1/2-inch smaller than openings. Single louvers frames shall not exceed 66 inches wide. When openings exceed 66 inches, provide twin louvers separated by mullion members.

2.03 CLOSURE ANGLES AND CLOSURE PLATES:

- A. Fabricate from 0.074-inch thick stainless steel or aluminum.
- B. Provide continuous closure angles and closure plates on inside head, jambs and sill of exterior wall louvers.
- C. Secure angles and plates to louver frames with screws, and to masonry or concrete with fasteners as specified.

2.04 WIRE GUARDS:

- A. Provide wire guards on outside of all exterior louvers, except on exhaust air louvers.
- B. Fabricate frames from 0.081-inch thick extruded or sheet aluminum designed to retain wire mesh.
- C. Wire mesh shall be woven from not less than 0.063-inch diameter aluminum wire 1/2- inch square mesh.
- D. Miter corners and join by concealed corner clips or locks extending about 2- 1/4 inches into rails and stiles. Equip wire guards over four feet in height with a mid-rail constructed as specified for frame components.

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- E. Fasten frames to outside of louvers with aluminum or stainless steel devices designed to allow removal and replacement without damage to the wire guard or the louver.

2.05 FINISH:

- A. In accordance with NAAMM Metal Finishes Manual: AMP 500-505
- B. Aluminum Roof Louvers:
 - 1. Anodized finish
 - a. Chemically etched medium matte, with integrally colored anodic coating, Class I Architectural, 0.7 mils thick.
 - b. Color: Provide standard color brochure of colors to select from.
- C. Sheet Steel: Baked-on or oven dried shop prime coat.
 - 1. Finish painting of exposed surfaces of shop primed louvers is specified in Section 09 91 00, PAINTING.
- D. Fluoropolymer resin (PVDF) colored finished
- E. Steel: Surfaces of steel work, for which no other finish is specified, shall be cleaned free from scale, rust, oil and grease, and then given a light colored prime paint after fabrication, except ferrous metals concealed in finished work. Paint all contact surfaces of assembled work (except welded contact surfaces) with an additional shop coat of similar paint.

PART 3 – EXECUTION

3.01 INSTALLATION:

- A. Set work accurately, in alignment and where shown. Items shall be plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.
- B. Furnish setting drawings and instructions for installation of anchors and for the positioning of items having anchors to be built into masonry construction. Provide temporary bracing for such items until masonry is set.
- C. Provide anchoring devices and fasteners as shown and as necessary for securing louvers to building construction as specified. Power actuated drive pins may be used, except for removal items and where members would be deformed or substrate damaged by their use.

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- D. Generally, set wall louvers in masonry walls during progress of the work. If wall louvers are not delivered to job in time for installation in prepared openings, make provision for later installation. Set in cast-in-place concrete in prepared openings.

3.02 CLEANING AND ADJUSTING:

- A. After installation, all exposed prefinished and plated items and all items fabricated from stainless steel and aluminum shall be cleaned as recommended by the manufacturer and protected from damage until completion of the project.
- B. All movable parts, including hardware, shall be cleaned and adjusted to operate as designed without binding or deformation of the members, so as to be centered in the opening of frame, and where applicable, to have all contact surfaces fit tight and even without forcing or warping the components.

3.03 PROTECTION:

- A. Provide protection for aluminum against galvanic action wherever dissimilar materials are in contact, by painting the contact surfaces of the dissimilar material with a heavy coat of bituminous paint (complete coverage), or by separating the contact surfaces with a performed synthetic rubber tape having pressure sensitive adhesive coating on one side.
- B. Isolate the aluminum from plaster, concrete and masonry by coating aluminum with zinc-chromate primer.
- C. Protect finished surfaces from damage during fabrication, erection, and after completion of the work. Strippable plastic coating on colored anodized finish is not approved.
- D. For bird screens, provide ¼ inch square 16 gage mesh.

END OF SECTION

**SECTION 09 91 00
PAINTING**

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. Section specifies field painting.
- B. Section specifies prime coats which may be applied in shop under other sections.
- C. Painting includes coatings specified and striping or markers and identity markings.

1.02 RELATED WORK:

- A. Shop prime painting of steel and ferrous metals: Division 05 – METALS

1.03 REFERENCES:

- A. Master Painters Institute (MPI):

MPI # 13	Stain, Exterior, Solvent Based
MPI # 72	Polyurethane, Two-Component, Pigmented, Gloss Solvent Based
MPI # 97	Traffic Marking Paint, Latex
MPI # 105	Graffiti Protection Top-Coat

1.04 SUBMITTALS:

- A. Manufacturer's Literature and Data:
 - 1. Before work is started, submit manufacturer's literature and standard colors.
 - 2. Master Painters Institute (MPI) "Approved Product List" indicating brand label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use subsequent MPI "Approved Product List", however, only one list may be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate must be from a single manufacturer. No variation from the MPI "Approved Product List" where applicable is acceptable.
- B. Sample of identity markers if used.

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- C. Manufacturers' Certificates indicating compliance with specified requirements:
 - 1. Manufacturer's paint substituted for Federal Specification paints meets or exceeds performance of paint specified.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. Deliver materials to site in manufacturer's sealed container marked to show following:
 - 1. Name of manufacturer.
 - 2. Product type.
 - 3. Instructions for use.
 - 4. Safety precautions.
- B. In addition to manufacturer's label, provide a label legibly printed as following:
 - 1. Surface upon which material is to be applied.
 - 2. If paint or other coating, state coat types; prime, body or finish.
- C. Maintain space for storage, and handling of painting materials and equipment in a neat and orderly condition to prevent spontaneous combustion from occurring or igniting adjacent items.

1.06 WARRANTY

- A. Provide 7-year paint manufactures warranty against product failure.
- B. Provide 2-year paint applicator's workmanship warranty.

1.07 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MATERIALS:

- A. Solvent based, oil (or oil/alkyd), simi-transparent, (optional pigmented) stain for wood surfaces. MPI 13 for wood facility members.

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1. Radda Paint Semi-Transparent Exterior Wood Stain or equal.
- B. A solvent based, two component polyurethane, pigmented coating with a gloss finish for interior or exterior concrete, concrete block, wood and metal surfaces, where abrasion, weathering, chemical and solvent resistance is required. MPI 72 for facility metal features,
 1. Sherwin-Williams Acrolon 218HS or equal
- C. Water based latex type, pigmented coating used for interior or exterior, zone and parking line marking. MPI 97 for pavement marking.
 1. Sherwin-Williams Setfast Acrylic Waterborne Traffic Marking Paint or equal.
- D. A solvent or water based, clear protective coating for applications to exterior painted surfaces to protect from, or facilitate the removal of, graffiti. Must be resistant to commercial and industrial cleaners designed to remove graffiti. The coating must be non-yellowing when exposed to sunlight. MPI 105 for masonry block walls
 1. Sherwin-Williams 2K Waterbased two-part Urethane Anti-Graffiti clear, Satin Series or equal.

2.02 PAINT PROPERTIES:

- A. Use ready-mixed (including colors), except two component epoxies, polyurethanes, polyesters, paints having metallic powders packaged separately and paints requiring specified additives.
- B. Where no requirements are given in the referenced specifications for primers, use primers with pigment and vehicle, compatible with substrate and finish coats specified.

2.03 REGULATORY REQUIREMENTS/QUALITY ASSURANCE:

- A. Paint materials shall conform to the restrictions of the local Environmental and Toxic Control jurisdiction.
 1. Volatile Organic Compounds (VOC): VOC content of paint materials shall not exceed 10g/l for interior latex paints/primers and 50g/l for exterior latex paints and primers.
 2. Lead-Based Paint: Is not allowed.
 3. Asbestos: is not allowed
 4. Chromate, Cadmium, Mercury, and Silica: Materials shall not contain zinc-chromate, strontium-chromate, Cadmium, mercury or mercury compounds or free crystalline silica.

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5. Human Carcinogens: Materials shall not contain any of the ACGIH-BKLT and ACGHI-DOC confirmed or suspected human carcinogens.
6. Use high performance acrylic paints in place of alkyd paints, where possible or as specified here with...
7. VOC content for solvent-based paints shall not exceed 250g/l and shall not be formulated with more than one percent aromatic hydro carbons by weight.

PART 3 – EXECUTION

3.01 JOB CONDITIONS:

- A. Safety: Observe required safety regulations and manufacturer's warning and instructions for storage, handling and application of painting materials.
 1. Take necessary precautions to protect personnel and property from hazards due to falls, injuries, toxic fumes, fire, explosion, or other harm.
 2. Deposit soiled cleaning rags and waste materials in metal containers approved for that purpose. Dispose of such items off the site at end of each day's work.
- B. Atmospheric and Surface Conditions:
 1. Do not apply coating when air or substrate conditions are:
 - a. Less than 5 degrees F above dew point.
 - b. Below 50 degrees F or 95 degrees F, unless specifically pre-approved by the Architect and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.
 2. Maintain interior temperatures until paint dries hard.
 3. Do no exterior painting when it is windy and dusty.
 4. Do not paint in direct sunlight or on surfaces that the sun will soon warm.
 5. Apply only on clean, dry and frost-free surfaces except as follows:
 - a. Apply water thinned acrylic paints to damp (not wet) surfaces where allowed by manufacturer's printed instructions.
 - b. Dampened with a fine mist of water on hot dry days concrete and masonry surfaces to which water thinned acrylic paints are applied to prevent excessive suction and to cool surface.
 6. Wood Varnish/Stains
 - a. Apply in clean areas and in still air.
 - b. Before stains are applied, vacuum and dust area.
 - c. Immediately before varnish/stains are applied, wipe down surfaces with a tack rag.

3.02 SURFACE PREPARATION:

- A. Method of surface preparation is optional, provided results of finish painting produce solid even color and texture specified with no overlays.
- B. General:
 - 1. Remove prefinished items not to be painted such as lighting fixtures, escutcheon plates, hardware, trim, and similar items for reinstallation after paint is dried.
 - 2. Remove items for reinstallation and complete painting of such items and adjacent areas when item or adjacent surface is not accessible or finish is different.
 - 3. See other sections of specifications for specified surface conditions and prime coat.
 - 4. Clean surfaces for painting with materials and methods compatible with substrate and specified finish. Remove any residue remaining from cleaning agents used. Do not use solvents, acid, or steam on concrete and masonry.
- C. Wood:
 - 1. Sand to a smooth even surface and then dust off.
 - 2. Sand surfaces showing raised grain smooth between each coat.
 - 3. Wipe surface with a tack rag prior to applying finish.
 - 4. Surface painted with an opaque finish:
 - a. Coat knots, sap and pitch streaks with MPI 36 (Knot Sealer) before applying paint.
 - b. Apply two coats of MPI 36 (Knot Sealer) over large knots.
 - 5. After application of prime or first coat of stain, fill cracks, nail and screw holes, depressions and similar defects with wood filler paste. Sand the surface to make smooth and finish flush with adjacent surface.
 - 6. Before applying finish coat, reapply wood filler paste if required, and sand surface to remove surface blemishes. Finish flush with adjacent surfaces.
- D. Ferrous Metals:
 - 1. Remove oil, grease, and soil, drawing and cutting compounds, flux and other detrimental foreign matter in accordance with SSPC-SP 1 (Solvent Cleaning).
 - 2. Remove loose mill scale, rust, and paint, by hand or power tool cleaning, as defined in SSPC-SP 2 (Hand Tool Cleaning) and SSPC-SP 3 (Power Tool Cleaning). Exception: where high temperature aluminum paint is used, prepare surface in accordance with paint manufacturer's instructions.

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3. Fill dents, holes and similar voids and depressions in flat exposed surfaces of hollow steel doors and frames, access panels, roll-up steel doors and similar items specified to have semi-gloss or gloss finish with TT-F-322D (Filler, Two-Component Type, For Dents, Small Holes and Blow-Holes). Finish flush with adjacent surfaces.
 - a. This includes flat head countersunk screws used for permanent anchors.
 - b. Do not fill screws of item intended for removal such as glazing beads.
4. Spot prime abraded and damaged areas in shop prime coat which expose bare metal with same type of paint used for prime coat. Feather edge of spot prime to produce smooth finish coat.
5. Spot prime abraded and damaged areas which expose bare metal of factory finished items with paint as recommended by manufacturer of item.

E. Zinc-Coated (Galvanized) Metal, Surfaces Specified Painted:

1. Clean surfaces to remove grease, oil and other deterrents to paint adhesion in accordance with SSPC-SP 1 (Solvent Cleaning).

F. Concrete Masonry Units (CMU) and Concrete,:

1. Clean and remove dust, dirt, oil, grease efflorescence, form release agents, laitance, and other deterrents to paint adhesion.
2. Use emulsion type cleaning agents to remove oil, grease, paint and similar products. Use of solvents, acid, or steam is not permitted.
3. Remove loose mortar in masonry work.
4. Replace mortar and fill open joints, holes, cracks and depressions with new mortar.

3.03 PAINT PREPARATION:

- A. Thoroughly mix painting materials to ensure uniformity of color, complete dispersion of pigment and uniform composition.
- B. Do not thin unless necessary for application and when finish paint is used for body and prime coats. Use materials and quantities for thinning as specified in manufacturer's printed instructions.
- C. Remove paint skins, then strain paint through commercial paint strainer to remove lumps and other particles.
- D. Mix two component and two-part paint and those requiring additives in such a manner as to uniformly blend as specified in manufacturer's printed instructions unless specified otherwise.

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- E. For tinting required to produce exact shades specified, use color pigment recommended by the paint manufacturer.

3.04 APPLICATION:

- A. Start of surface preparation or painting will be construed as acceptance of the surface as satisfactory for the application of materials.
- B. Unless otherwise specified, apply paint in three coats; prime, body, and finish. When two coats applied to prime coat are the same, first coat applied over primer is body coat and second coat is finish coat.
- C. Apply each coat evenly and cover substrate completely.
- D. Allow not less than 48 hours between applications of succeeding coats, except as allowed by manufacturer's printed instructions,
- E. Finish surfaces to show solid even color, free from runs, lumps, brush marks, laps, holidays, or other defects.
- F. Apply by brush, roller or spray, except as otherwise specified.
- G. Do not spray paint in existing occupied spaces unless approved by park representative, except in spaces sealed from existing occupied spaces.
 - 1. Apply painting materials specifically required by manufacturer to be applied by spraying.
 - 2. In areas, where paint is applied by spray, mask or enclose with polyethylene.

3.05 PRIME PAINTING:

- A. Apply Paint and stains in accordance with manufacture's instruction. and
- B. Additional field applied prime coats over shop or factory applied prime coats are not required except for exterior exposed steel apply an additional prime coat.
 - 1. Wood – apply wood varnish/stain coating in accordance with manufacturer's instructions.
 - 2. Concrete Masonry Units – apply wood varnish/stain coating in accordance with manufacturer's instructions

3.06 PROTECTION CLEAN UP, AND TOUCH-UP:

- A. Protect work from paint droppings and spattering by use of masking, drop cloths, removal of items or by other approved methods.

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- B. Upon completion, clean paint from hardware, glass and other surfaces and items not required to be painted of paint drops or smears.
- C. Before final inspection, touch-up or refinished in a manner to produce solid even color and finish texture, free from defects in work which was damaged or discolored.

END OF SECTION

SECTION 09 96 23
GRAFITI-RESISTANT COATINGS

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Permanent anti-graffiti coating system

1.02 RELATED WORK

- A. Section 04 22 00 – Concrete Unit Masonry: Substrate for application of Anti-Graffiti Coating.
- B. Section 07 19 00 – Water Repellents for unpainted surfaces.
- C. Section 09 90 00 – Painting: Primer for masonry stain and elastomeric applications, if applicable.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01 33 00.
- B. Instructions: Provide instructions bearing manufacturer's name, coating type, and recommended installation procedures. Provide methods and material instruction for graffiti removal. Include adhesive-backed graffiti removal instruction label suitable for application to interior surface.
- C. Submit proof of purchase (Invoice of materials purchased) and proof of delivery of coating materials.
- D. Manufacturer's Warranty: Submit one copy of manufacturer's warranty for specified materials.
- E. Field Sample: Apply graffiti resistant coating to field mock-up sample representing exterior wall surface to be coated. Apply coating system over a minimum 3 ft x 3 ft test area and test removal of applied spray paint in presence of Construction Manager for approval using removal methods recommended by the manufacturer.

1.04 QUALITY ASSURANCE

- A. Contractor Qualifications: Installer shall be a firm with not less than three years of successful experience in application of coatings of type required on

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substrates similar to those of this project. The firm shall be approved by the manufacturer of the coating for installation of their product.

- B. Manufacturer's representative shall inspect substrate conditions including alkalinity and moisture content. Obtain written approval from representative before proceeding with work.
- C. Meets ASTM-D7089 with Cleanability at least Level 2.
- D. Meets ASTM-D6578 with Cleanability at least Level 9.

1.05 DELIVERY STORAGE AND HANDLING

- A. Section 01 60 00 - Product Requirements: Transport, handle, store, and protect products.
- B. Paint orders to the manufacturer or supplier shall identify the store number, location, and address of project. Contractor shall require a record keeping account be established and maintained by the paint supplier which records graffiti resistant paint type, brand, and quantity purchased, for the specific project.
- C. Deliver coating materials in sealed original labeled containers, bearing manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and/or reducing.
- D. Store materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F in ventilated area and as required by manufacturer's instructions.
- E. Prevent fire hazards and spontaneous combustion.

1.06 EXTRA MATERIALS

- A. Furnish the following to building owner upon completion of the Project.
- B. Provide four containers of removal products as recommended by the manufacturer accompanied by removal instructions.

1.07 WARRANTY

- A. Provide manufacturers written warranty guaranteeing effective graffiti removal for not less than 10 years and warrant that treated surfaces can be effectively and repeatedly cleaned of graffiti without damage or loss of effectiveness of the graffiti resistant coating. Manufacturer shall, for the duration of the warranty period, guarantee replacement of product where graffiti removal has shown to be ineffective

1.08 PROJECT CONDITIONS

- A. Environmental Requirements: Follow manufacturer's recommendations for temperature range in which coating may be applied.

1.09 MAINTENANCE

- A. Deliver cleaning products to Store Manager for storage and subsequent use for graffiti removal. Apply cleaning instructions label to interior wall location as directed by the Construction Manager.

1.10 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements provide:
 - 1. VandlGuard Non-Sacrificial Graffiti Coating (Three Coats) by Rainguard International, Newport Beach, CA 888-765-7070.
 - 2. Micro-Seal Water Repellant (One Coat) by Rainguard International, Newport Beach, CA 888-765-7070. (For first coat on unpainted concrete and masonry surfaces): As specified in Section 07 19 00.
 - 3. Graffiti Remover: VandlClean Super graffiti remover by Rainguard International, Newport Beach, CA 888-765-7070.
 - 4. Or Equal

2.02 PERFORMANCE REQUIREMENTS

- A. Graffiti resistant coating shall be a clear, non-sacrificial graffiti resistant coating which provides protection for exterior vertical surfaces from permanent graffiti staining and damage caused by spray paint and marking pens. Coating shall be suitable for application to painted and unpainted surfaces including masonry, concrete, metals, and EIFS. Product shall be of type such that recoating with the underlying paint is possible without removal of the graffiti resistant coating. Product shall be a coating that dries clear, non-yellowing, with a low luster.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify all surfaces are ready to receive coating in accordance with manufacturer's printed requirements. Beginning of installation indicates acceptance of substrate.
- B. Unpainted Concrete and Masonry: Verify water repellant has been applied in accordance with Section 07 19 00 to new or non-painted concrete and masonry surfaces prior to the application of the anti-graffiti coating.

3.02 PREPARATION

- A. Surface shall be free of dirt, dust, contaminants such as curing compounds, hardeners, bond breakers, and form release. Allow painted surfaces to cure properly. Do not water blast painted surfaces. Assure surfaces are clean and dry.
- B. Mask or otherwise protect adjacent surfaces not scheduled to receive coating. If applied on unscheduled surfaces such as glass, remove immediately, by approved method.
- C. Protect landscaping, property, and vehicles from over spray and drift.

3.03 APPLICATION

- A. Apply coating in accordance with manufacturer's published instructions.
- B. Application Rate: Apply each coat at the manufacturers published application rate.

3.04 SURFACES TO BE COATED

- A. Apply graffiti resistant coating to all exterior exposed building surfaces visible from the ground level, including concrete, masonry, metal doors and frames, sheet metal items, downspouts, EIFS, stucco, wood, painted metal bollards, pneumatic tubing, and metal railing. Apply coating to painted and unpainted surfaces. Exclude horizontal surfaces subject to wheel or foot traffic.
- B. Apply to exterior non-building vertical surfaces including solid or semi-solid fencing, segmental block or concrete panel retaining walls, and masonry screening as applicable.
- C. On building surfaces, apply coating system to first definitive continuous horizontal demarcation including change in paint color or surface material but not less than 12 feet above finish grade. Apply to full height of exterior overhead or coiling door surfaces. Apply to top of building if no definitive continuous horizontal demarcation lines exist. Exclude wall and door surfaces

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behind fenced enclosures such as Garden Center, Battery Storage, or Compressor House Enclosure.

3.05 FIELD QUALITY CONTROL

- A. Verify application rate by periodic on-site inspection and calculation of area covered compared to consumption of coating material used. Document inspections showing total area covered and number and volume of coating containers used.

END OF SECTION

SECTION 10 28 00
TOILET AND BATH ACCESSORIES

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. This section specifies manufactured items usually used in dressing rooms, toilets, baths, locker rooms and at sinks in related spaces.
- B. Items Specified:
 - 1. Hand Dryer (HD)
 - 2. Toilet tissue dispenser (TPD).
 - 3. Grab Bars (GB).
 - 4. Accessibility Signage (AS)
- C. This section also specifies toilet accessories that are furnished by the city and installed by the Contractor (OFCI).

1.02 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 REFERENCES:

- 1. Standard Specifications for Public Works Construction “The Greenbook” (2012 Edition) including 2012 San Diego Regional Supplement, 2015 City of Chula Vista Supplement, and 2015 Supplement by DeLorenzo International.
- B. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

A167-99(R2004)	Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
A176-99(R2004)	Stainless and Heat-Resisting Chromium Steel Plate, Sheet, and Strip
A269-07	Seamless and Welded Austenitic Stainless-Steel Tubing for General Service
A312/A312M-06	Seamless and Welded Austenitic Stainless-Steel Pipes

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F446-85 (R2004)	Consumer Safety Specification for Grab Bars
	and Accessories Installed in the Bathing Area.
A269-07	Seamless and Welded Austenitic Stainless-Steel
	Tubing for General Service

C. The National Association of Architectural Metal Manufacturers (NAAMM):

1. AMP 500 Series Metal Finishes Manual
2. AMP 500-505-88 Metal Finishes Manual and Finishes for Stainless Steel

1.04 SUBMITTALS:

A. Submit for review and approval

B. Shop Drawings:

1. Each product specified.
2. Paper towel dispenser.
3. Metal framed mirrors, fillers, and design and installation of units when installed on ceramic tile wainscots and offset surfaces.
4. Grab bars, showing design and each different type of anchorage.
5. Show material and finish, size of members, and details of construction, installation and anchorage of mop racks.

C. Samples:

1. One of each type of accessory specified.
2. After approval, samples may be used in the work.

D. Manufacturer's Literature and Data:

1. All accessories specified.
2. Show type of material, gages or metal thickness in inches, finishes, and when required, capacity of accessories.
3. Show working operations of spindle for toilet tissue dispensers.

E. Manufacturer's Certificates:

1. Attesting that soap dispensers are fabricated of material that will not be affected by liquid soap or aseptic detergents, PhisoHex and solutions containing hexachlorophene.
2. Anodized finish as specified.

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1.05 **QUALITY ASSURANCE:**

- A. Each product shall meet, as a minimum, the requirements specified, and shall be a standard commercial product of a manufacturer regularly presently manufacturing items of type specified.
- B. Each accessory type shall be the same and be made by the same manufacturer.
- C. Each accessory shall be assembled to the greatest extent possible before delivery to the site.
- D. Include additional features, which are not specifically prohibited by this specification, but which are a part of the manufacturer's standard commercial product.

1.06 **DELIVERY, STORAGE AND HANDLING:**

- A. Pack accessories individually to protect finish.
- B. Deliver accessories to the project only when installation work in rooms are ready to receive them.
- C. Deliver inserts and rough-in frames to site at appropriate time for building-in.
- D. Deliver products to site in sealed packages of containers; labeled for identification with manufacturer's name, brand, and contents.
- E. Store products in weathertight and dry storage facility.
- F. Protect from damage from handling, weather and construction operations before, during and after installation in accordance with manufacturer's instructions.

1.07 **PAYMENTS**

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 **MATERIALS:**

- A. Stainless Steel:

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1. Plate or sheet: ASTM A167, Type 302, 304, or 304L, except ASTM A176 where Type 430 is specified, 0.0299-inch thick unless otherwise specified.
 2. Tube: ASTM A269, Alloy Type 302, 304, or 304L.
- B. Stainless Steel Tubing: ASTM A269, Grade 304 or 304L, seamless or welded.
- C. Stainless Steel Pipe: ASTM A312; Grade TP 304 or TP 304L.
- D. Steel Sheet: ASTM A653, zinc-coated (galvanized) coating designation G90.

2.02 FASTENERS:

- A. Exposed Fasteners: Stainless steel or chromium plated brass, finish to match adjacent surface, all exposed fasteners shall be tamper resistant.
- B. Concealed Fasteners: Steel, hot-dip galvanized (except in high moisture areas such as showers or bath tubs use stainless steel).
- C. Toggle Bolts: For use in hollow masonry or frame construction.
- D. Screws:
1. Fed Spec. FF-S-107, Stainless steel Type A.
- E. Adhesive: As recommended by manufacturer for products to be joined.

2.03 FINISH:

- A. In accordance with NAAMM AMP 500 and as per selected items with factory finishes.

2.04 HAND DRYER (HD):

- A. World Dryer Model XA-Automatic Hand Dryer, 115V (20Amp) or approved equal.

2.05 TOILET TISSUE DISPENSERS (TPD):

- A. Aslin Industries Model TPD0200NB-SS – Toilet Paper Dispenser or approved equal.

2.06 GRAB BARS (GB):

- A. Bobrick B Series # 6806: 1-1/2-inch diameter stainless steel pipe grab bar. For each Accessible toilet as indicated on drawings:
1. (1) 18-inch vertical grab bar

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2. (1) 36-inch horizontal grab bar
3. (1) 48-inch horizontal grab bar

B. Accessories

1. Stainless steel: Grab bars, flanges, mounting plates, supports, screws, bolts, and exposed nuts and washers.

2.07 SOAP DISPENSER:

- A. Bobrick B2112 Stainless steel, 22 gage or approved equal.

PART 3 – EXECUTION

3.01 INSTALLATION:

- A. Set work accurately, in alignment and where shown. Items shall be plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.
- B. Toggle bolt to steel anchorage plates in frame partitions or hollow masonry. Expansion bolt to concrete or solid masonry.
- C. Install accessories in accordance with the manufacturer's printed instructions and ASTM F446.
- D. Install accessories plumb and level and securely anchor to substrate.
- E. Install accessories in a manner that will permit the accessory to function as designed and allow for servicing as required without hampering or hindering the performance of other devices.
- F. Position and install dispensers, and other devices in countertops, clear of drawers, permitting ample clearance below countertop between devices, and ready access for maintenance as needed.
- G. Align mirrors, dispensers and other accessories even and level, when installed in group.
- H. Install accessories to prevent striking by other moving, items or interference with accessibility.

3.02 CLEANING:

- A. After installation, clean as recommended by the manufacturer and protect from damage until completion of the project.

END OF SECTION

SECTION 13 10 00
SPECIAL FACILITY REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

- A. The Work of this section includes furnishing and installation of the following components (but not limited to):
 - 1. Bucking Chutes
 - 2. Feeder Troughs
 - 3. Livestock Corral Systems
 - 4. Horse Hitches
 - 5. Rodeo Arena Fencing and Equipment
 - 6. Striping Chutes
- B. Additional requirements are described in Attachment A (Livestock Equipment Package Drawings) attached to the end of this Section.
- C. It is the Contractor's responsibility for scheduling and coordinating the Work of sub-Contractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
- D. The Contractor is responsible for troubleshooting the systems after installation until they function according to the requirements of the Drawings and Specifications. All combinations of manufactured equipment that are provided under these Specifications shall be entirely compatible, and the Contractor shall be responsible for the compatible and successful operation of each component of the equipment items.

1.02 SUBMITTALS

- A. Product Data – The following shall be submitted:
 - 1. Type and model numbers of all equipment and/or components
 - 2. Product cutsheets and brochures of all equipment and/or components
- B. Drawings – Drawings shall include the minimum following items:
 - 1. Dimensions, and materials for all equipment and/or components covered in this specification
 - 2. Dimensioned layout and arrangement drawings where applicable
 - 3. Installation and layout of equipment and appurtenances
 - 4. Field connection locations to utilities where applicable
 - 5. Total equipment weight

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- C. Guarantee and Warranty Information – Submit all guarantee and warranty information described in the Paragraph entitled "Guarantee and Warranty."
- D. Operation and Maintenance Manuals: Submit operation and maintenance manuals for each type of equipment and/or component specified herein.

1.03 QUALITY ASSURANCE

- A. All equipment specified herein shall be new and of current manufacturer. The equipment furnished shall be designed and constructed in accordance with the best practices and methods and shall operate satisfactorily when installed as shown on the Drawings and used per the manufacturer's recommendations.
- B. Where two or more equipment/component units are being furnished of the same type, such items shall be by the same manufacturer. Where a system with multiple components is being furnished, all the components shall be manufactured or supplied by a single manufacturer to ensure coordination and proper operation of the component pieces of the system

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Packaging shall be as required to prevent damage during shipment and unloading.
- B. Deliver materials to the site to insure uninterrupted progress of the work. Deliver anchor bolts and anchorage devices where required in ample time not to delay that work.
- C. The Contractor shall store and temporarily support equipment prior to installation in strict accordance with the manufacturer's recommendations and instructions. Protect all exposed surfaces.
- D. Handle all equipment and materials very carefully. Damaged equipment and materials will not be acceptable. Protect all bolt threads, etc. from damage and corrosion. Protect all factory applied coatings from damage during shipment, unloading, storage and installation.

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1.05 **GUARANTEE AND WARRANTY**

- A. The Contractor shall obtain from the Manufacturer, a manufacturer warranty for all material, equipment, and components specified in this Section.
- B. The warranty period shall be as described herein. Equipment warranty shall cover all failures of material or workmanship which occur as the result of normal operation and service excluding normal wear parts. The manufacturer shall repair and/or replace any parts proven to be defective, within the guarantee period, freight on board (FOB) the job site at the manufacturer's expense.

1.06 **PAYMENTS**

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 **BUCKING CHUTES**

- A. Bucking chutes shall be constructed of 8 and 11-gauge steel components.
- B. Steel components shall be coated with an UV-resistant architectural grade powder coat finish.
- C. The guides for the roll gates shall located at the bottom of each chute to provide safe, non-obtrusive operation.
- D. Each roll gate track features a dirt “kick out” outlet to keep the track free of debris that could inhibit gate function.
- E. Roll gates feature ball bearing rollers and automatic gravity locks.
- F. The front release gate shall be equipment with a spring-loaded lever latch that locks when open to eliminating any snags that could possibly hip an animal.
- G. The front release gate latches shall be shielded from the inside of the chute for added safety.
- H. The pitch of the front release gate shall be easily leveled using a simple adjustment bolt, allowing to compensate for uneven ground.

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- I. Bucking Chutes shall come standard with an attached folding platform. This platform shall fold down to provide a safe and sturdy access platform along the back of the chute. This platform shall fold up against the back of the chute when not in use.
- J. Bucking chutes shall be manufactured by Priefert or approved equal.

2.02 FEEDER TROUGHS

- A. Feeder troughs shall be feed bunks constructed of galvanized steel with rolled edges.
- B. Dimensions: 10' Length x 18" height x 32" width. 9" Pan depth.
- C. Feed bunk sheet metal thickness shall be 18-gauge, minimum.
- D. Feed bunk shall utilize a durable non-metallic liner.
- E. Feeder troughs shall be by Priefert or approved equal.

2.03 LIVESTOCK CORRALS

- A. Layout drawings of all corral systems shall be submitted for review.
- B. The following corral systems, equipment, and components shall be furnished and installed as shown on following drawings of Attachment A (Livestock Equipment Package Drawings) attached to the end of this Section:
 - 1. LS3.1 – Livestock Corral (Area 3)
 - 2. LS3.7 – Livestock Alley
- C. Area 4 Corrals shall be 10'x10' corrals in concrete footings.
- D. Items shall be by Priefert or approved equal.

2.04 HORSE HITCHES

- A. Hitches shall be self-supported rails that are 10 feet long and 42 inches in height with two legs on each side. Hitches shall be constructed of a single 2-3/8" diameter galvanized steel rail with 4-inch radius rounded corners to make a smooth and continuous transition from the horizontal part of the rail to the vertical legs.
- B. Hitches shall have three (3) evenly spaced 3/8-inch plated steel tie rings welded to bottom of the horizontal portion of the rail.
- C. The legs of the hitches shall be cast in the center of a 12-inch diameter concrete footing. The concrete footing shall begin 2 inches from the finished

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grade and extend to 42 inches below grade. The hitch legs shall terminate 6-inches from the bottom of the footing.

- D. Hitches shall be suitable for tying three horses: two tied on the same side on the outer tie rings, and one on the opposite side tied to the center ring.

2.05 RODEO ARENA FENCING AND EQUIPMENT

- A. Layout drawings of all arena fencing, and equipment systems shall be submitted for review.
- B. The following fencing systems, equipment, and components shall be furnished and installed as shown on following drawings of Attachment A (Livestock Equipment Package Drawings) attached to the end of this Section:
 - 1. LS1.1 – Covered arena fencing/gates/chutes
 - 2. LS2.1 – Outdoor arena fencing/gates/chutes
- C. Items shall be by Priefert or approved equal.

2.06 STRIPING CHUTES

- A. Stripping chutes shall be designed to create a safe area for removing ropes and/or head wraps from steers. The stripping chute shall have a step-over entry that is sheeted to discourage steer from backing out of the chute, and a split gate on the opposite end that serves as a blocking gate that can be opened by pulling down on a release lever. Contoured sides that narrow at the bottom shall discourage animals from turning around inside the chute. The bottom of the chute shall include an open section on each side at the back of the chute to provide easy access for removing heel ropes.
- B. Dimensions:
 - 1. Overall Height: 71 inches
 - 2. Width:
 - a. Overall Width: 36 inches
 - b. Inside width at top: 30 inches
 - c. Inside width at bottom: 14 inches
 - 3. Overall Length: 73 inches
- C. Stripping chutes shall be Priefert or approved equal.

2.07 WATER TROUGHS

- A. Water troughs shall be 7 to 10-gallon automatic fill livestock waterers.
- B. The body of the waterers shall be constructed of durable UV-resistant, non-metallic materials.

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- C. The automatic fill mechanism shall utilize a float with brass fittings that connects to a water supply. The automatic fill mechanism shall not require electrical power.
- D. The water troughs shall have an 8-year warranty.
- E. Water troughs shall be TRU-TEST, Model WaterPro 2, or approved equal.

PART 3 – EXECUTION

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ATTACHMENT A

LIVESTOCK EQUIPMENT PACKAGE DRAWINGS

END OF SECTION

SECTION 13 34 16
PERMANENT GRANDSTANDS (LEG TRUSS DESIGN)

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. Provide labor, material, equipment and supervision necessary to complete installation of permanent steel grandstand, including the following:
 - 1. Steel Substructure
 - 2. Decking System
 - 3. Concrete Foundation

1.02 SUBMITTALS:

- A. Manufacturer's Product Data: Submit manufacturer's descriptive product data for project.
- B. Shop Drawings: Manufacturer to submit shop drawings sealed by a registered engineer and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the applicable code and relevant laws.
- C. Certificates:
 - 1. Insurance Certificate
 - 2. Bid Bond
- D. Product Sample: Submit one 18-inch seat sample.
- E. Color Sample: If applicable, submit sample.

1.03 QUALITY ASSURANCE:

- A. Manufacturer Qualifications: Manufacturers must have ten years of experience in the manufacture of bleachers and grandstands; manufacturer must exhibit proof of business existence for past five years with documentation; welders must be AWS certified.
- B. Installer Qualifications: Experienced in the proper installation of grandstands.
- C. Source Quality Control: Mill Test Certification.

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1.04 SITE CONDITIONS:

- A. Field Site:
 - 1. Owner to make site accessible.
 - 2. Owner to verify site locations, benchmarks.
- B. Underground Utility Line: Owner to clearly mark all underground utilities and obstructions and Owner to relocate all that conflict with grandstand.
- C. Soil Test: Furnished by Owner.

1.05 BUILDING CODES:

- A. Must meet or exceed all State and Local applicable codes and in compliance with the California Building Code, Title 24 and ICC 300.

1.06 WARRANTY:

- A. Permanent Grandstand shall be under warranty for a period of one (1) year beginning at Date of Substantial Completion. The warranty will provide for repair or replacement of failed components due to defect in materials and workmanship of installation for the specified period. This warranty excludes any other defects resulting from abnormal use in service, vandalism, weathering, oxidation, accidental or intentional damage or any occurrences beyond Manufacturer's control.

1.07 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MANUFACTURERS:

- A. Basis of Design: Southern Bleacher Company (800) 433-0912. Leg Truss System.
 - 1. Alternate manufacturers seeking to be pre-approved to bid must submit product literature and references (with contact names/numbers) to the Owner, 14 days prior to bid date, for five similar size DSA approved projects completed within the past two years.

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2. Each manufacturer is to provide their own engineered submittal. Southern Bleacher's submittal information is for their exclusive use.
3. No time extensions to the schedule will be granted awaiting approval of submittals, and liquidated damages apply.

2.02 PERMANENT STEEL GRANDSTAND:

A. Product Description

1. Leg Truss Design: Gross seating capacity of 490, net seating capacity of 379 including 6 wheelchair spaces, 10 rows, and 73' 6" long.
2. Vertical columns are placed 6 feet on center laterally and as required front to back.
3. Stringers: Stringers are wide flange with steel angle rise and depth fabrication and are placed at 6 feet on center and supported by vertical columns
4. Front Walkway:
 - a. Clear width 6' 2".
 - b. Elevated 2' 6" above grade at benchmark.
5. Entry stairs (TWO) to be firmly anchored to uniformly poured concrete bases.
 - a. Stair rise: 6 inches with aluminum closure and contrasting aluminum stair nose.
 - b. Stair tread depth: 11 inches.
 - c. Guardrails: As required by code.
 - d. Stairs to have handrail extension. The handgrip portion of handrails shall not be less than 1 1/2 inches or more than 2 inches in cross-sectional dimension or the shape shall provide an equivalent gripping surface. The handgrip portion of handrails shall have a smooth surface with no sharp corners. The top of handrails and handrail extensions shall be placed not less than 34 inches or more than 38 inches above the nosing of treads and landings. Where handrails are not continuous between flights, the handrails shall extend horizontally at least 12 inches beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. Ends shall be returned or shall terminate in newel posts or safety terminals.
6. Aisles:
 - a. Aisles with seating on both sides to have discontinuous mid-aisle handrails. The handrails shall be discontinuous with breaks at intervals not to exceed five rows. These breaks shall have a clear

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- width of at least 22 inches and not greater than 36 inches horizontally.
 - b. Anodized aluminum handrails with rounded ends to be provided with an intermediate handrail below the main handrail.
 - c. Aluminum tread nosing of contrasting color on aisle steps.
 - d. Half-steps shall be provided for riser heights above 8 inches.
 - e. Half-steps shall provide equal rise and run throughout aisle. Each shall have aisle nosing with non-skid black powder coated finish or other paint system meeting AAMA 603.8-92 specifications with a hardness rating of 2H and riser closure with clear anodized finish.
 - f. Aisles with a riser height of non-uniformity shall be indicated with distinctive markings as required by code.
7. Decking:
- a. Rise per row 8 inches, depth per row 26 inches.
 - b. Each seat 17 inches above its respective tread.
 - c. Mill Aluminum Decking Arrangement
 - 1) Full-Plank Arrangement
 - d. Seating Selection
 - 1) Anodized Aluminum Bench Seat
 - a) 2 x 10 (standard), Die #7758 with height of 1 1/2".
8. Guard railing: To be at all sides of bleacher, entry stairs and ramps, portals, and landings. Railing to be anodized aluminum with end plugs at ends of straight runs and/or elbows at corner. All guardrails shall be secured to angle rail risers by galvanized fasteners. Railing shall be at heights as required by code for its location on the grandstand. Guard railing shall include intermediate railing, or galvanized chain link fencing fastened in place with galvanized fasteners and aluminum ties.
9. Ramps: (TWO REQUIRED)
- a. Slope: 1 in 12.5.
 - b. Guardrails: As required by code plus toe board.
 - c. Handrail: Ramps to have handrail extension. The handgrip portion of handrails shall not be less than 1 1/2 inches or more than 2 inches in cross-sectional dimension or the shape shall provide an equivalent gripping surface. The handgrip portion of handrails shall have a smooth surface with no sharp corners. The top of handrails and handrail extensions shall be placed not less than 34 inches or more than 38 inches above the ramp surface. Where handrails are not continuous between runs, the handrail shall extend horizontally above the landing 12 inches minimum beyond the top and bottom ramps. Ends shall be returned or shall terminate in newel posts or safety terminals.

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10. Viewing Platform: A 7' 10" deep X 12' wide viewing platform shall be provided In lieu of the upper rows of seating. Railings shall be provided at the front, sides, and rear of the platform. A clear anodized countertop shall be provided across the entire width of the platform and the front fascia of the platform shall be clad with a clear anodized aluminum riser board façade.
 11. Handicap provision:
 - a. Quantity of wheelchair spaces: Per plans
 - b. Riser area adjacent to wheelchair spaces to have intermediate construction so 4" diameter sphere cannot pass through opening.
- B. Materials/Finishes
1. Substructures:
 - a. Structural shapes meet one of the following ASTM specifications: A36, A36/A572 grade 50, A572 grade 50, A529-50, or A500 grade B.
 - b. Shop connections are seal welds.
 - c. After fabrication, all steel is hot-dipped galvanized to ASTM-A-123 specifications.
 - d. Painted steel is unacceptable.
 2. Extruded Aluminum:
 - a. Seat Planks, Backrests, Stanchions, Riser Planks and Railing are extruded aluminum alloy, 6063-T6. (1) Clear anodized 204R1, AA-M10C22A31, Class II
 - b. Tread Planks: Extruded aluminum alloy, 6063-T6 mill finish.
 - c. Railing: Extruded aluminum alloy, 6063-T6 clear anodized 204R1, AA-M10C22A31, Class II.
 3. Accessories:
 - a. Channel End Caps: Aluminum alloy 6063-T6, clear anodized 204R1, AA-M10C22A31, Class II.
 - b. Cast End Caps: Aluminum 319 alloy, cast finish. (Required for backrest and RS plank only)
 - c. Hardware:
 - 1) Bolts, Nuts: Hot-dipped galvanized or mechanically galvanized.
 - 2) Hold-down Clip Assembly: Aluminum alloy 6005A-T6, mill finish.
 - 3) Structural Hardware: Equal to or greater than hot-dipped galvanized ASTM-A307. No connections utilizing high strength bolts are classed as slip critical.
 - d. Aisle Nose and Stair Nose: Aluminum alloy, 6063-T6, non-skid black powder coated finish or other paint system meeting AAMA 603.8-92 specifications with a hardness rating of 2H.

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C. Fabrication:

1. Design Load:
 - a. Tread and Seat Area: 100 psf uniform live load.
 - b. Seat (Vertical): 120 lbs/lf.
 - c. Seat (Horizontal Sway): 24 lbs/lf parallel and 10 lbs/lf perpendicular to seat.
 - d. Handrail and Guardrail: 50 lbs/lf in any direction.
 - e. Handrail and Guardrail: 200 lbs concentrated in any direction.
 - f. Snow Loads: As per State adopted code.
 - g. Wind Loads: As per State adopted code.
 - h. Seismic Loads: As per State adopted code.
2. All manufactured connections to be shop welded.
 - a. Manufactured by certified welders conforming to AWS Standards.

PART 3 – EXECUTION

3.01 INSTALLATION:

- A. All work performed by technicians experienced in bleacher seating installation.
- B. Project as per approved shop drawings.

3.02 FIELD QUALITY CONTROL:

- A. Foundation: A structural concrete matt slab shall be poured to provide the foundation for the system. Slab shall be structural in nature, and a minimum of 6” thick with # 4 rebar tied in both directions every 12” on center. Concrete shall attain working strength of 3,000 psi.

3.03 CLEAN-UP:

- A. Clean up all debris caused by work of this section.
- B. The Owner, Architect and Contractor acknowledge and accept that mill finish aluminum as specified will have water stains present from transportation and storage during installation. Removal of these stains is not part of this contract.
- C. Stand to be broom cleaned at completion.

END OF SECTION

SECTION 13 34 19
METAL BUILDING SYSTEM (PRE-ENGINEERED ARENA STRUCTURE)

PART 1 – GENERAL

1.01 SUMMARY OF WORK

- A. The Work of this section includes furnishing and installation of the following components (but not limited to):
 - 1. Metal Framing Components.
 - 2. Metal Wall Panels and Trim.
 - 3. Metal Roof Panels and Trim.
 - 4. Metal Building Accessories
 - 5. Concrete Foundations

1.02 RELATED WORK

- A. Section 03 20 00 – Concrete Reinforcing
- B. Section 03 30 00 – Cast in place Concrete
- C. Section 08 63 00 – Metal Framed Skylights

1.03 REFERENCES

- A. A. American Institute of Steel Construction (AISC):
 - 1. AISC Specification for Structural Steel Buildings.
 - 2. AISC Serviceability Design Considerations for Low-Rise Buildings
- B. American Iron and Steel Institute (AISI):
 - 1. AISI North American Specification for the Design of Cold-Formed Steel Structural Members
- C. American Welding Society (AWS):
 - 1. AWS D1.1 / D1.1M – Structural Welding Code – Steel.
 - 2. AWS D1.3 / D1.3M – Structural Welding Code – Sheet Steel
- D. Association for Iron & Steel Technology (AISE):
 - 1. AISE 13 – Specifications for Design and Construction of Mill Buildings.
- E. ASTM International (ASTM):

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1. ASTM A 36 – Standard Specification for Carbon Structural Steel
2. ASTM A 48 – Specification for Gray Iron Castings
3. ASTM A 123 – Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
4. ASTM A 307 – Specification for Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength
5. ASTM A 325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
6. ASTM A 354 – Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners
7. ASTM A 475 – Specification for Zinc-Coated Steel Wire Strand
8. ASTM A 490 – Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength
9. ASTM A 500 – Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
10. ASTM A 529 – Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.
11. ASTM A 563 – Specification for Carbon and Alloy Steel Nuts
12. ASTM A 572 – Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
13. ASTM A 653 / A 653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
14. ASTM A 792 / A 792M – Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
15. ASTM A 992 – Standard Specification for Structural Steel Shapes.
16. ASTM A 1011 – Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
17. 17. ASTM A 1039 – Specification for Steel, Sheet, Hot Rolled, Carbon, Commercial, Structural, and High-Strength Low-Alloy, Produced by Twin-Roll Casting Process
18. ASTM E 96 / E 96M – Standard Test Methods for Water Vapor Transmission of Materials.
19. ASTM E 108—Spread-of Flame Testing: Class 1A Rating.
20. ASTM E 283 – Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
21. ASTM E 331 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
22. ASTM E 1592 – Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
23. ASTM E 1646 – Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference
24. ASTM E 1680 – Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems

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25. ASTM E 2140 – Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head
26. ASTM F 436 – Specification for Hardened Steel Washers
27. ASTM F 1145 – Specification for Turnbuckles, Swaged, Welded, Forged
28. ASTM F 1554 – Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength

F. CSA – Canadian Standards Association

G. CWB – Canadian Welding Bureau

H. IAS – International Accreditation Service

I. LGSI – Light Gauge Steel Institute

J. SJI – Steel Joist Institute

K. Metal Building Manufacturers Association (MBMA):

1. MBMA Metal Building Systems Manual.

L. Underwriters Laboratories (UL):

1. UL 580 – Standard for Tests for Uplift Resistance of Roof Assemblies.

1.04 DEFINITIONS

A. Metal Building System: A building system that will employ:

1. Either continuous or simple-span 'Z' or 'C'-shaped cold-formed purlins or open-web steel joists for support of the roof cladding.
2. Simple-span 'Z' or 'C'-shaped cold-formed purlins or open-web steel joists for support of the steel wall cladding.
3. Three-plate, built-up rigid space frames and/or cold-formed 'C' or hot-rolled I-shaped post-and-beam framing to support the roof and wall secondary members.
4. All systems (cladding, roof and wall secondary, lateral primary framing, and longitudinal bracing) work together to provide resistance to vertical and lateral loading demands.

B. Gable Symmetrical: A continuous frame building with the ridge in the center of the building, consisting of tapered or straight columns and tapered or straight rafters. The sidewall girts may be continuous (by-passing the columns) or simple span (inset in the column line). The rafters may or may not have interior columns.

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- C. Roof Slope: Pitch expressed as inches of rise for each 12" of horizontal run.
- D. Building Width: Measured from outside to outside of sidewall secondary structural member (girt).
- E. Building Eave Height: A nominal dimension measured from the finished floor to top flange of eave strut.
- F. Building Length: Measured from outside to outside of endwall secondary structural member.
- G. Auxiliary Loads: Dynamic loads induced by cranes, conveyors, or other material handling systems.
- H. Collateral Loads: The weight of any non-moving equipment or material, such as ceilings, electrical or mechanical equipment, sprinkler systems, plumbing, or ceilings.
- I. Dead Load: The actual weight of the building system (as provided by the metal building supplier) supported by a given member.
- J. Floor Live Loads: Loads induced on a floor system by occupants of a building and their furniture, equipment, etc.
- K. Roof Live Loads: Loads produced by maintenance activities, rain, erection activities, and other movable or moving loads but not including wind, snow, seismic, crane, or dead loads.
- L. Roof Snow Loads: Gravity load induced by the weight of snow or ice on the roof, assumed to act on the horizontal projection of the roof.
- M. Seismic Loads: Loads acting in any direction on a structural system due to the action of an earthquake.
- N. Wind Loads: The loads on a structure induced by the forces of wind blowing from any horizontal direction.

1.05 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- B. Shop Drawings:

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1. Submit complete erection drawings for the proper identification and assembly of all building components. Drawings will show anchor bolt settings, transverse cross-sections, sidewall, endwall and roof framing, flashing and sheeting, and accessory installation details. Design analysis shall be included in the erection shop drawing submittal.
2. Submit concrete foundation drawings that show layout, critical dimensions, and steel reinforcement locations.
- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Calculations: Structural calculations for the buildings and foundations shall be submitted.
- E. Verification Samples: For each finish product specified, two samples, representing actual product, color, and patterns.
- F. Certifications: Shop drawings, calculations, and design analysis shall bear the seal and signature of a registered professional structural engineer licensed in the state of California. Design analysis for the buildings shall be on file and furnished by manufacturer upon request.
- G. Bill of Materials: Bills of material shall be furnished and shall include item weights.
- H. Preventative Maintenance Manual.
- I. Welder's Certifications: Certification of welder qualifications shall be furnished as specified by the Project Engineer.
- J. Submit certification verifying that the metal roof system has been tested and approved by Underwriter's Laboratory as Class 90.
- K. Submit certification verifying that the metal standing seam roof system has been tested in accordance with ASTM E 1592 test protocols.

1.06 QUALITY ASSURANCE

- A. Manufacturer / Fabricator Qualifications:
 1. All primary products specified in this section will be supplied by a single IAS AC 472 Accredited Manufacturer /Fabricator with a minimum of five (5) years' experience.
- B. Weldments/Welder/Weld Inspection Qualifications:
 1. Welding inspection and welding inspector qualification for structural steel shall be in accordance with AWS D1.1, "Structural Welding Code

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– Steel”, latest edition. Welding inspection and welding inspector qualification for cold-formed steel shall be in accordance with AWS D1.3, “Structural Welding Code – Sheet Steel”, latest edition.

- C. Erector Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
- D. Design: Standard drawings and design analysis must bear the seal and signature of a registered professional structural engineer licensed in the state of California. Design analysis must be on file and furnished by manufacturer upon request.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer’s original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer’s instructions.
 - 2. Keep materials in manufacturer’s original, unopened containers and packaging until installation.
 - 3. Do not store materials directly on ground.
 - 4. Store materials on flat, level surface, raised above ground, with adequate support to prevent sagging.
 - 5. Protect materials and finish during storage, handling, and installation to prevent damage.
- C. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- D. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.08 WARRANTY

- A. Building System Warranty
 - 1. Furnish manufacturer’s standard warranty for the metal building system, excluding paint.

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2. The manufacturer shall warranty the metal building system against failure due to defective material or workmanship for a period of one (1) year from date of shipment.
3. The liability under this warranty shall not be limited to furnishing, but shall include dismantling or installing, necessary replacement material F.O.B. manufacturer's plant. In no event shall the manufacturer be liable for loss of profits, or other incidental, consequential, or special damages.

B. Standing Seam Roof Weathertightness Warranty

1. Furnish manufacturer's weathertightness warranty for a maximum of 20 years against leaks in standing seam roof panels, arising out of or caused by ordinary wear and tear under normal weather and atmospheric conditions.

C. Roof and Wall Paint Finish Warranty

1. Paint Systems
 - a. Furnish manufacturer's standard warranty for the metal panel paint system against chipping, peeling, blistering, fading in excess of 5 NBS Hunter units as set forth in ASTM-D-2244, and chalking in excess of 8 units as set forth in ASTM-D-4214.
 - b. The warranty shall be for a period of 30 years from the date of shipment for PVDF paint systems.
2. Galvalume® systems
 - a. Furnish manufacturer's standard warranty for the Galvalume® panels against rupture, structural failure, or perforation due to normal atmospheric conditions.
 - b. The warranty shall be for a period of 20 years from the date of shipment for Galvalume® systems.

1.09 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Olympia Steel Builders

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- B. American Buildings Company
- C. Nucor Building Systems
- D. Or equal

2.02 DESIGN REQUIREMENTS

A. General

1. The building manufacturer will use standards, specifications, recommendations, findings and/or interpretations of professionally-recognized groups such as AISC, AISI, AWS, ASTM, MBMA, Federal Specifications, and unpublished research by MBMA as the basis for establishing design, drafting, fabrication, and quality criteria, practices, and tolerances. The Manufacturer's design, drafting, fabrication and quality criteria, practices, and tolerances shall govern, unless specifically countermanded by the contract documents.
2. Design structural mill sections and built-up plate sections in accordance with:
 - a. (US) code-appropriate edition of AISC's "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings", ANSI/AISC 360 ASD method.
3. Cold-Formed steel structural members and panels will generally be designed in accordance with "Specifications for the Design of Cold-Formed Steel Structural Members", 2007 Edition, ANSI/AISI S-100-07.
4. Design weldments per the following:
 - a. Structural Welding
 - 1) (US) Design per AWS D1.1, "Structural Welding Code – Steel", Latest Edition.
 - b. Cold-Formed Welding
 - 1) (US) Design per AWS D1.3, "Structural Welding Code – Sheet Steel", Latest Edition.

B. Design Code:

1. Structural design for the building structural system shall be provided by the metal building system manufacturer for the following design criteria:
 - a. Governing Building Code: California Building Code
 - b. Year/Version: 2019
 - c. Occupancy Category: III.

C. Design Loads:

1. Dead Load – Weight of the building system as determined by manufacturer.
2. Roof Live Load: 20 PSF

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3. Collateral Load: To be determined by the Contractor
4. Roof Snow Load:
 - a. Ground Snow Load: 0 PSF
 - b. Snow Exposure Coefficient (C_e): N/A
 - c. Thermal Coefficient (C_t): N/A
 - d. Roof Snow Load: N/A
5. Wind Load:
 - a. a. Wind Speed: 115 MPH
 - b. b. Wind Exposure: C
6. Seismic Load:
 - a. Spectral response acceleration for short periods (S_s): 0.911g
 - b. Spectral response acceleration for 1-sec. period (S_1): 0.349g
 - c. Site Class: D
7. Floor Load.
 - a. Live Load: NA
 - b. Dead Load (Weight of Material by others): NA
 - c. Collateral Load: NA
8. Auxiliary Loads: Auxiliary loads shall include dynamic loads, such as cranes and material handling systems, and will be defined in the Contract Documents.

D. General Serviceability Limits:

1. Deflection Limits shall be in accordance with the applicable provisions of the Metal Building Systems Manual (MBMA), latest edition.
2. Vertical Deflections:
 - a. Roof Secondary (Purlins) – $L/150$.
 - b. Main Frame roof beams – $L/180$.
3. Horizontal Deflections:
 - a. Wall Secondary (Girts) – $L/90$.
 - b. Main Frames – $H/60$.
4. Vertical deflection limits apply for snow load (50-year mean-recurrence interval) plus collateral load, or the code required live load. The horizontal drift and deflections limits apply for the loads induced by a basic wind speed corresponding to a 10-year mean-recurrence interval.

E. Foundations:

1. Foundations for all buildings shall be designed by the Contractor in accordance with the geotechnical report titled (Geotechnical Investigation – Lakeside Equestrian Facility, June 8, 2017) included in the Contract document. The Contractor shall submit design drawings, design calculations, and product data as specified.

2.03 MATERIALS

A. Primary Framing Steel:

1. Steel for hot rolled shapes must conform to the requirements of ASTM Specifications A- 36, A-572 or A-992, with minimum yield of 50 ksi, respectively.
2. Steel for built-up sections must conform to the requirements of ASTM A-1011, A-1018, A-529, A-572 or A-36 as applicable, with minimum yield of 50 ksi as indicated by the design requirements.
3. Round Tube must conform to the requirements of ASTM A-500 Grade B with minimum yield strength of 42 ksi.
4. Square and Rectangular Tube must conform to the requirements of ASTM A-500 Grade B with a minimum yield strength of 46 ksi.
5. Steel for Cold-Formed Endwall "C" sections must conform to the requirements of ASTM A-1011 or A-1039 Grade 55, or ASTM A-653 Grade 55 with minimum yield strength of 55 ksi.
6. X-bracing will conform to ASTM A-36 or ASTM A-529 for rod and angle bracing or ASTM A-475 for cable bracing.

B. Secondary Framing Steel:

1. Steel used to form purlins, girts and eave struts must meet the requirements of ASTM A- 1011 or ASTM A-1039 Grade 55 for primed material or ASTM A-653 Grade 55 for galvanized material with a minimum yield of 55 ksi.
2. Design Thicknesses – Gauge to be determined by design to meet specified loading conditions.

C. Panels:

1. Roll-formed Galvalume®, pre-painted Galvalume® or Galvanized G90 Exterior-Side and G60 Interior-Side.
2. Standing Seam Panels must have:
 - a. (For US and Export) 50 percent minimum aluminum-zinc alloy-coating and conform to ASTM A-792 or ASTM A-653 with a minimum yield of 50 ksi.
3. Through-fastened panels must have:
 - a. (For US and Export) 50 percent minimum aluminum-zinc alloy coating and conform to ASTM A-792 or ASTM A-653 with a minimum yield of 50 ksi.
4. Panel Finish:
 - a. SP Finish: Modified Siliconized Polyester paint system with a 25-year finish warranty.

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- b. PVDF Finish: 70% PVDF paint system with a 30-year finish warranty.

D. Panel Fasteners:

- 1. For Galvalume® and Painted finished roof panels: Long Life Cast Zinc head.
- 2. For wall panels: Coated carbon steel.
- 3. Color of exposed fastener heads to match the wall and roof panel finish.
- 4. Concealed Fasteners: Self-drilling type, of size required.

E. Flashing and Trim: Match material, finish, and color of adjacent components. Provide trim at rakes, including peak and corner assemblies, high and low eaves, corners, bases, framed openings and as required or specified to provide weathertightness and a finished appearance.

F. Roof Clips:

- 1. All clips must have factory-applied mastic and designed so that movement between the panel and the clip does not occur.
- 2. Short or Tall Fixed clips; shall be either 3 ½ inches (89mm) or 4 ½ inches (114mm) in height. Used for applications where only a moderate amount of thermal expansion and contraction in the roof panel is expected.
- 3. Short or Tall Sliding clips: shall be either 3 ½ inches (89mm) or 4 ½ inches (114mm) in height and provide either 1-7/8 inches or 3 7/8 inches of travel for panel thermal expansion and contraction, depending on clip choice.

G. Sealant and Closures:

- 1. Sidelaps: Factory applied non-skinning Butyl mastic.
- 2. Endlaps: Eave, Ridge Assembly, and Gable Flashings: Field applied 100% solids butyl- based elastomeric tape sealant, furnished in pre-cut lengths.
- 3. Outside Closures: Closed-cell, plastic or metal
- 4. Inside Closures: Closed-cell, plastic or metal

2.04 PRIMARY FRAMING

A. Rigid Frames: Fabricated as welded built-up "I" sections or hot-rolled sections.

- 1. Frame Design: Gable Symmetrical.
- 2. Frame Design: Gable Unsymmetrical.
- 3. Frame Design: Single Slope.
- 4. Frame Design: Lean-To.

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5. Frame Type: Clear-Span.
 6. Frame Type: Multi-Span.
- B. Rigid Frame Columns:
1. Straight/Uniform depth
 2. Tapered
- C. Rigid Frame Rafters:
1. Straight/Uniform depth
 2. Tapered
- D. Endwall Frames / Roof Beams: Fabricated as mill-rolled sections or built-up "I" sections depending on design requirements. Fabricate endwall columns of cold-formed "C" sections, mill- rolled sections, or built-up "I" sections depending on design requirements.
- E. Interior Columns: Columns supporting rafters of mainframes shall be of the following cross- section type(s):
1. Pipe (Round HSS).
 2. Tube (Square HSS).
 3. "I"-Shaped (Built-Up or Mill-Rolled depending on design requirements).
- F. Finish: Galvanized (pre-coated galvanized cold-form, hot-dipped otherwise).
- G. Field Bolted Connections: All field bolted connections shall be designed and detailed utilizing ASTM A-325 or A-490 depending on design requirement.

2.05 SECONDARY FRAMING

- A. Purlins and Girts: Purlins and girts shall be cold formed "Z" sections with stiffened flanges. Flange stiffeners shall be sized to comply with the requirements of the latest edition of AISI and LGSI. They shall be pre-punched at the factory to provide for field bolting to the rigid frames. They shall be simple or continuous span as required by design. Connection bolts will install through the purlin/girt webs, not purlin/girt flanges.
- B. Purlins (Excluding Open Web Joists): Horizontal structural members which support roof coverings.
1. Depth: To be determined by design
 2. Maximum Length: To be determined by design.
 3. Finish: Pre-Coated Galvanized.
- C. Girts: Horizontal structural members that support vertical panels.

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1. Depth: To be determined by design
 2. Maximum Length: To be determined by design.
 3. Finish: Pre-Coated Galvanized.
- D. Eave Struts: Unequal flange, cold-formed "C" sections or "Z" purlins.
1. Depth: To be determined by design
 2. Maximum Length: To be determined by design.
 3. Finish: Pre-Coated Galvanized.
- E. Base Framing: Base members to which the base of the wall covering may be attached to the perimeter of the slab. Secured to the concrete slab with mechanical anchors.
1. Formed base sill.
 2. Base channel.
 - a. With flashing.
 3. Base angle.
 - a. With flashing.
 4. Base girt.
 - a. With flashing.
 5. Finish: Pre-Coated Galvanized.
- F. Roof Joist System.
1. Open web, parallel chord, simple span load carrying members suitable for the direct support of roof systems utilizing material sizes and yield strengths as required.
 2. Roof joist system with reduced bridging on qualified "CFR" projects.
 3. Bridging
 - a. Welded
- G. Open web members shall be fabricated of material that conforms to the material specifications designated by the Steel Joist Institute as acceptable for this product

2.06 ROOF PANELS

- A. AWI "SR2" Insulated Roof Panel: A mechanically seamed trapezoidal standing seam roof sandwich panel with concealed clips. Installed directly over purlins. Tested in accordance with ASTM E 283 and E 331 for water penetration and air infiltration.
1. Exterior panel gauge: 26 (Std.).
 2. Interior panel gauge: 26 (Std.).
 3. Size / Thermal Value: 40 inches (1016mm) wide by 6 inches (152mm) high (R-50).

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4. Color: To be determined.
5. Standard Finish:
 - a. Exterior: To be determined.
 - b. Interior: To be determined.

2.07 WALL PANELS

- A. AWI "DM40" Insulated Panel: A through-fastened wall sandwich panel with concealed fasteners.
 1. Exterior panel gauge: 26 (Std.).
 2. Interior panel gauge: 26 (Std.).
 3. Size / Thermal Value: 40 inches (1016mm) wide by 4 inches (102mm) high (R-32).
 4. Color: To be determined.
 5. Standard Finish:
 - a. Exterior: To be determined.
 - b. Interior: To be determined.

2.08 ACCESSORIES

- A. Roof Line Trim:
 1. Trim Type: Simple Eave/Rake Trim.
- B. Roof Curbs: Welded units fabricated for Metal Roof application. Minimum 18-gauge Galvalume™ coated steel, with welds cleaned and treated with protective coating compatible with the Galvalume™ substrate.
 1. Top of curb to be level, with 1 ½" top flange.
 2. Curb walls insulated with 1 ½"-3lb.density fiberglass insulation.
 3. Welded cricket on upslope side of curb to divert water.
 4. Metal rib covers supplied loose for flexibility when installing curb.
 5. Standard sub-frame shall be minimum 16-gauge steel.
 6. All fasteners and sealants required for installation shall be furnished by metal building manufacturer.
- C. Roof Vents: Accessories used on the roof to allow air to pass through.
 1. Gravity Ridge Vents: Can be used as single unit or continuous.
 - a. Size: 12 inch by 10 foot (305x3048mm) with Damper & Lockerpull.

2.09 PANEL FINISHES

- A. Roof panel:

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1. Exterior panel:
 - a. PVDF Resin, 30-year Finish Warranty:
 - 1) Color: To be determined.
 2. Interior panel:
 - a. Siliconized Polyester Resin, 25-year Finish Warranty:
 - 1) Color: To be determined.
- B. Wall panel:
1. Exterior panel:
 - a. PVDF Resin, 30-year Finish Warranty:
 - 1) Color: To be determined
 2. Interior panel:
 - a. Siliconized Polyester Resin, 25-year Finish Warranty
 - 1) Color: To be determined.
- C. Soffit Panel:
1. Siliconized Polyester Resin, 25-year Finish Warranty
 - a. Color: To be determined.

2.10 FABRICATION

- A. General:
1. Shop-fabricate all framing members for field bolted assembly. The surfaces of the bolted connections must be smooth and free from burrs or distortions.
 2. Shop connections must conform to the manufacturer's standard design practices as defined in this section. Certification of welder qualifications will be furnished when required and specified in advance.
 3. All framing members must carry an identifying mark.
- B. Primary Framing:
1. Plates, Stiffeners and Related Members.: Factory weld base plates splice plates, cap plates, and stiffeners into place on the structural members.
 2. Bolt Holes and Related Machining: Shop fabricate base plates, splices and flanges to include bolt connection holes. Shop fabricated webs to include bracing holes.
 3. Secondary structural connections (purlins and girts) to be ordinary bolted connections, which may include welded clips.
 4. Manufacturer is responsible for all welding inspection in accordance with the manufacturer's IAS Accreditation or CAN/CSA A660 Certification. Special inspection by the buyer or owner may be done in the manufacturer's facility and must be noted on the Contract Documents.

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5. Non-Destructive Testing (NDT) - NDT shall be performed and documented as required by the governing building code for this project.

C. Open-Web Roof Joists:

1. Purlins for 'long-bay' building layouts shall consist of open-web bar joists designed under Steel Joist Institute (SJI) specifications by an SJI-Certified Joist Manufacturer for the prescribed loads.
2. Joist systems shall include joist bridging and joist-seat-to-supporting structural connections using 3/8" diameter self-drilling bolts made from ASTM A354 Grade BD steel.
3. Field welding of joist bridging and seats is an alternative method for connection of joists to supporting primary structural members.

D. Zee Purlins:

1. Fabricate purlins from cold-formed "Z" sections with stiffened flanges. Size flange stiffeners to comply with the requirements of the latest edition of AISI. Connection bolts will install through the webs, not the flanges.

E. Girts

1. Girts must be simple or continuous span as required by design. Connection bolts will install through the webs, not the flanges.

F. Bracing:

1. Diagonal Bracing:
 - a. Wind bracing in the roof and/or walls need not be furnished where it can be shown that the diaphragm strength of the roof and/or wall covering is adequate to resist the applied wind or seismic forces. Diagonal bracing in the roof and sidewalls may be used to resist longitudinal loads (wind, crane, etc.) in the structure if diaphragm action cannot be used.
 - b. Diagonal bracing will be furnished to length and equipped with hillside washers and nuts at each end. It may consist of rods threaded each end or galvanized cable with suitable threaded end anchors. If load requirements so dictate, bracing may be of structural angle and/or pipe, bolted in place.
2. Special Bracing: When diagonal bracing is not permitted in the sidewall, a rigid frame type portal or fixed base column will be used.
3. Flange Braces: The compression flange of all primary framing must be braced laterally with angles connecting to the bottoms chords of purlins or to the webs of girts so that the flange compressive stress is within allowable limits for any combination of loading.
4. Bridging:

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- a. Laterally bridge the top and bottom chords of the open-web bar joists as required by design thereof and specified on the building erection drawings.
- G. Standing Seam Panels - General:
- 1. One side of the panel is configured as female, having factory applied hot-melt mastic inside the female seam. The female side will hook over the male side and when seamed creates a continuous lock, forming a weathertight seam.
 - 2. Panels are factory notched at both ends so that field installation can commence or terminate from either end of the building. Panels cannot start at both ends of the building and work towards each other.
 - 3. Maximum panel length is 55 feet (16,764mm) unless otherwise noted in the Contract Documents.
 - 4. Endlaps:
 - a. Endlaps must have a 16-gauge backup plate and have the four endlap joint fasteners installed in four pre-punched holes in the flat.
 - b. Apply mastic between the panels and secured with #17-14 x 1 1/4 inch (32mm) self-tapping fasteners through the panels, and backup plate to form a compression joint.
 - c. "Through-the-Roof" fasteners may only be used at endlaps and eaves.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Before erection proceeds, survey elevations and locations of concrete and masonry bearing surfaces and locations of anchor rods, bearing plates and other embedment's to receive structural framing, with Erector present, for compliance with requirements and metal building system manufacturer's tolerances.
- C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary

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construction loads equal in intensity to design loads. Remove temporary supports when permanent structural framing connections and bracing are in place, unless otherwise indicated.

3.03 INSTALLATION

- A. The erection of the building system shall be performed by a qualified erector, in accordance with the appropriate erection drawings, erection guides and /or other documents furnished by manufacturer, using proper tools, equipment and safety practices.
- B. Erection practices shall conform to “Common Industry Practices”, Section 6, MBMA (LR)- Building Systems Manual.
- C. There shall be no field modifications to primary structural members except as authorized and specified by manufacturer.

3.04 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 13 34 23.10
PRE-ENGINEERED ANNOUNCERS BOOTH

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. The work shall include furnishing the sealed architectural, structural, mechanical, and electrical plan sets as well as the structural, mechanical, and electrical building components as a complete, pre-designed packaged pavilion as shown on drawings and as specified herein.

1.02 SCOPE:

- A. Packaged pavilion and all associated design and engineering, with all listed components supplied by Romtec, Inc., hereafter designated as the building supplier. The building supplier shall be a single source design, engineering, and manufacturer who shall supply the packaged pavilion and meet all the following scope requirements.

- B. The contractor is responsible for building installation, hereafter designated as the building installer. Building installer work will generally include: site preparation and grading, excavations for structures, backfill and/or structural backfill, foundation and pad construction, and building construction.

Note: Romtec Inc. does not serve as the building installer. Romtec Inc. is only the packaged pavilion supplier.

- C. The packaged pavilion should be the latest standard product of a building supplier regularly engaged and having at least ten (10) years of experience in packaged pavilion engineering, design, supply, and construction.
- D. The building supplier must meet or exceed the product specification which was prepared using the Romtec Inc. building as a guide and example.
- E. Alternate building suppliers shall demonstrate that they have designed, engineered, produced, delivered, and constructed at minimum ten (10) other functioning site built pavilions of similar type. Project completion date and a reference contact from the owner of each project must be provided.
- F. Alternate building suppliers must also disclose all instances of any prior municipal or landscape architect's rejection of the same or similar product as an "or equal" to the specified basis of design building package.
- G. Contractors wanting to propose an "or equal" building supplier other than Romtec Inc. are required to submit a complete submittal package with full sealed plan sets, calculations, and all pre-engineered structural items, ten (10)

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calendar days prior to the bid opening date. Any products proposed as “or equal” that are not as specified must be specifically listed and accompanied by the manufacturer’s data sheets for review. This will be approved or denied prior to the bid opening. Incomplete submittals will be rejected and returned to the bidder.

- H. The building and its concrete footings, foundation, and slab are to be engineered by the building supplier to meet site specific conditions including wind and snow loading, local frost depth, and ground conditions.
- I. Footings are to be dug by the building installer and poured on site to meet local code for permanent structures. A prefabricated, modular mat placed on compacted base is not an accepted equal to a site specific, site poured, engineered foundation.
- J. Typical fasteners such as nails, staples, and screws shall be supplied by building installer. Atypical fasteners shall be supplied by building supplier.
- K. Building is to be designed and constructed on site to meet local codes and approvals for permanent structures. Any building that is temporary, permanently relocatable, prefabricated modular, an offsite constructed product, or pre-cast is not an accepted equal to permanent, on site, conventional construction.
- L. No outside entity approval will override the local building authority’s codes and inspections. Seals meant for modular homes and production plant certifications will not be allowed in lieu of sealed plans from a licensed engineer and conventional inspection during construction.
- M. The Romtec building package has been quoted with the specific product colors noted below. Changes to these color selections may result in a price increase.
- N. Building sidings, treatments, and roofing are to be as specified. Precast buildings with painted textures are not to be considered architecturally equivalent.
- O. Within one (1) week of contract award, the building supplier shall submit the packaged building preliminary Scope of Supply and Design Submittal (SSDS), including the building plan view and elevation drawings.
- P. The SSDS is reviewed by the necessary parties and returned to the building supplier with any revisions to the contractual language, product data sheets, and/or building plan view and elevation drawings. Once the design is approved, the building supplier will provide a sealed plan set stamped by an engineer licensed in the state that the building is located for building department review.

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- Q. One full round of sealed plan revisions are to be provided by the building supplier in the design and engineering services before additional fees apply.
- R. The building supplier shall submit complete, code compliant building plans including plans, elevations, sections, and details, under seal of a National Kitchen and Bathroom Association (NKBA) certified technical designer.
- S. The building supplier shall submit complete structural calculations meeting code loads, design loads, and seismic design under seal of a professional Engineer with current license in the state of California.
- T. Once submittal approval is received, three (3) wet stamped sets of plans and structural calculations shall be issued. Any additional plan sets and structural calculations can be obtained for a fee.
- U. The building supplier does not provide a final site plan.
- V. The reviewing authority reserves the right to review or reject all submittals at their sole discretion.
- W. All work and materials shall comply with the latest industry building codes and regulations for the state of California.
- X. Americans with Disabilities Act Accessibility Guidelines (ADAAG) will be followed in design, manufacture, and construction.
- Y. The specific supplier is indicated for each item. Building supplier, building installer, and owner supplied components are listed as such. Products not listed as building supplier or building installer supplied, are to be owner supplied.

1.03 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. The building supplier work shall include the design of the architectural, mechanical, structural, and electrical components that will be required for this building.
- C. The building will be designed as a complete, packaged building to be delivered to the job site to be constructed on site by the contractor.
- D. The building supplier will provide complete submittal documentation in the pre-engineered building suppliers standard submittal format for review.
- E. The following sections shall be included in the building supplier's Scope of Supply and Design Submittal. Incomplete submittals will be rejected and returned to the bidder.

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1. INTRODUCTION
2. BUILDING SUPPLIER PRODUCTS & SERVICES
3. PRODUCTS & SERVICES NOT SUPPLIED BY BUILDING SUPPLIER
4. WARRANTY & LIMITATIONS
5. PROJECT DESIGN
6. PRODUCT DATA SHEETS

- F. The building supplier will provide the building plan view and elevation with the Scope of Supply and Design Submittal (SSDIS) electronically for review and approval.
1. The building supplier will revise the SSDS per the review comments.
 2. Once the design is approved, the building supplier will provide a sealed plan set stamped by an Engineer licensed in California for building department review.
 3. The building supplier will provide (2) sealed plan sets.
Note: Pricing allows for one revision in response to comments. Should additional revisions be requested, Romtec will provide a change order for the additional design work.
 4. The plan set standard size is 11" x 17".
Note: If a larger plan set size is required it will result in a price increase.
- G. The building supplier to supply O&M manuals if requested.

1.04 DELIVERY, STORAGE, AND HANDLING:

- A. The building supplier freight shall be based on delivering the product on a 48' to 53' flatbed or van truck and trailers, or as close as they can legally get to the site. Overall dimensions of the truck and trailers shall be the following: 70' overall length, 102" wide and 168" high.
- B. The building package to arrive on organized pallets that are shrink wrapped and separated into stages for ease of installation. Bill of material stating stages of components to be included.
1. Stage 1 pallets to include components such as block, frames, vents, beams, connectors, trusses, etc.
 2. Stage 2 pallets to include filler wall material, windows, skylights, roofing, etc.
 3. Stage 3 pallets to include siding material, tile, doors etc.
 4. Stage 4 pallets to include toilets, sinks, drinking fountains, electrical fixtures, accessories, etc.

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1.05 WARRANTY:

- A. The building and all its associated components shall be warranted against defects in materials and workmanship for a period of not less than one (1) year from date of final acceptance.

1.06 MAINTENANCE:

- A. The building supplier does not supply maintenance for the packaged pavilion.

1.07 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 22 00 - Unit Prices for measurement and payment.
- C. Bid Schedule line item numbers covered by the section include but are not limited to:
 - 1. 344,373

PART 2 – PRODUCTS

2.01 MANUFACTURERS:

- A. Romtec, Inc.,
18240 North Bank Rd. Roseburg, OR. 97470
Tel: 541-496-3541; Fax: 541-496-0803;
Email: cdooley@romtec.com Web: www.Romtec.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 1.

2.02 BUILDING DESCRIPTION:

- A. Refer to plans for quantities, dimensions, locations, and installation methods for the materials and items described in this section. The building supplier reserves the right to make substitutions of equivalent materials and items without notice.
- B. Building dimensions shall match what is indicated on drawings.

2.03 STRUCTURE:

- A. Steel structure with columns shall be supplied by building supplier.

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1. All steel is primed and painted black.

2.04 ROOFING:

- A. Roof shall be supplied by building supplier except where noted.
 1. Metal roof over steel framing members.
- B. Roofing shall be Fabral, 26 gauge, Horizon 16 standing seam roof panels.
 1. Roofing package shall include inside and outside foam closures, matching trim (eaves, gables and ridge) and fasteners, sheet metal flashing (all sides), and 30# felt (under metal).
 2. Roofing color to be selected by the owner from the manufacturers standard color chart.

2.05 ELECTRICAL:

- A. The following electrical fixtures shall be supplied by building supplier.
- B. Light fixtures shall be supplied by building supplier.
 1. Interior surface mount, 48" LED light fixtures.
- C. Main breaker panel shall be supplied by building supplier.
 1. Breaker Panel shall be 100 Amp, single-phase.
 2. Note: This panel has been sized to accept only the loads of the building supplier electrical fixture package. The building supplier has the right to modify the main breaker panel to be most efficient based on any changes.

2.06 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS: CAST IN-PLACE CONCRETE:

- A. All equipment, labor, trades and materials shall be supplied by building installer.
 1. Includes all materials and labor for foundations/footings, interior slabs, exterior/entry slabs, and sidewalks.
- B. Engineered fill shall be ¾" minus crushed aggregate around footings, foundations, and slabs as required.
- C. Slab vapor barrier shall be 6-mil continuous plastic under the concrete slab.

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- D. The foundation shall be installed as designed with all cast in-place concrete poured to dimensions specified in final plans.
 - 1. Footings will be built to 24" depth.
 - 2. Minimum compressive strength of 3000 psi at 28 days, 4+/-1" slump, with max 3/4" aggregate, cured in accordance with ACI 308.
 - 3. Slabs shall have a fine broom finish with joints required in flat work as shown on plans.
 - 4. Steel rebar shall be installed as specified in final plans.
- E. Concrete slab sealer shall be a water-based transparent curing, sealing and dust proofing compound with two (2) coats to be applied per manufacturer's instructions.
- F. Refer to drawings for sidewalks and entry slabs.
 - 1. Minimum concrete compressive strength of 2500 psi at 28 days.
 - 2. Remesh or rebar reinforcement shall be used in sidewalks.
 - 3. All sidewalks shall be finished with a fine broom with control joints installed per engineer's specification.

2.07 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS:
STRUCTURE:

- A. Stairs/railings are by the building installer.

2.08 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS:
ELECTRICAL:

- A. Electrical rough-in, installation and trim shall be supplied by building installer.
 - 1. All underground and/or overhead service to building shall be as specified in the final site plan.
 - 2. Electric meter base and all rough wiring, switches, plugs and circuit breakers shall be as shown on final plans. The building supplier does not supply the meter base and meter.

PART 3 – EXECUTION

3.01 SPECIAL INSPECTION:

- A. If required, special inspection shall be owner supplied.
- B. If special inspection is required per the building department or other regulatory agencies, then the building supplier can assist but NOT provide this service.

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3.02 INSTALLATION:

- A. All components to be installed according to the plan sets and/or manufacturer's instructions.

3.03 OPERATION & MAINTENANCE MANUALS:

- A. Upon installation, do not throw away the Operations & Maintenance manuals that are provided by some manufacturers in their packaging. Requests for additional copies from the building supplier will result in subsequent charges.

END OF SECTION

SECTION 13 34 23.20
PRE-ENGINEERED COMPOST ENCLOSURE

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. The work shall include furnishing the sealed architectural, structural, mechanical, and electrical plan sets as well as the structural, mechanical, and electrical building components as a complete, pre-designed packaged compost enclosure as shown on drawings and as specified herein.

1.02 SCOPE:

- A. Packaged trash enclosure and all associated design and engineering, with all listed components supplied by Romtec, Inc., hereafter designated as the building supplier. The building supplier shall be a single source design, engineering, and manufacturer who shall supply the packaged trash enclosure and meet all the following scope requirements.
- B. The contractor is responsible for building installation, hereafter designated as the building installer. Building installer work will generally include: site preparation and grading, excavations for structures, backfill and/or structural backfill, foundation and pad construction, and building construction.

Note: Romtec Inc. does not serve as the building installer. Romtec Inc. is only the packaged trash enclosure

- C. The packaged trash enclosure should be the latest standard product of a building supplier regularly engaged and having at least ten (10) years of experience in packaged trash enclosure engineering, design, supply, and construction.
- D. The building supplier must meet or exceed the product specification which was prepared using the Romtec Inc. building as a guide and example.
- E. Alternate building suppliers shall demonstrate that they have designed, engineered, produced, delivered, and constructed at minimum ten (10) other functioning site built trash enclosures of similar type. Project completion date and a reference contact from the owner of each project must be provided.
- F. Alternate building suppliers must also disclose all instances of any prior municipal or landscape architect's rejection of the same or similar product as an "or equal" to the specified basis of design building package.
- G. Contractors wanting to propose an "or equal" building supplier other than Romtec Inc. are required to submit a complete submittal package with full

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sealed plan sets, calculations, and all pre-engineered structural items, ten (10) calendar days prior to the bid opening date. Any products proposed as “or equal” that are not as specified must be specifically listed and accompanied by the manufacturer’s data sheets for review. This will be approved or denied prior to the bid opening. Incomplete submittals will be rejected and returned to the bidder.

- H. The building and its concrete footings, foundation, and slab are to be engineered by the building supplier to meet site specific conditions including wind and snow loading, local frost depth, and ground conditions.
- I. Footings are to be dug by the building installer and poured on site to meet local code for permanent structures. A prefabricated, modular mat placed on compacted base is not an accepted equal to a site specific, site poured, engineered foundation.
- J. Typical fasteners such as nails, staples, and screws shall be supplied by building installer. Atypical fasteners shall be supplied by building supplier.
- K. Building is to be designed and constructed on site to meet local codes and approvals for permanent structures. Any building that is temporary, permanently relocatable, prefabricated modular, an offsite constructed product, or pre-cast is not an accepted equal to permanent, on site, conventional construction.
- L. No outside entity approval will override the local building authority’s codes and inspections. Seals meant for modular homes and production plant certifications will not be allowed in lieu of sealed plans from a licensed engineer and conventional inspection during construction.
- M. The Romtec building package has been quoted with the specific product colors noted below. Changes to these color selections may result in a price increase.
- N. Building sidings, treatments, and roofing are to be as specified. Precast buildings with painted textures are not to be considered architecturally equivalent.
- O. Within one (1) week of contract award, the building supplier shall submit the packaged trash enclosure preliminary Scope of Supply and Design Submittal (SSDS), including the building plan view and elevation drawings.
- P. The SSDS is reviewed by the necessary parties and returned to the building supplier with any revisions to the contractual language, product data sheets, and/or building plan view and elevation drawings. Once the design is approved, the building supplier will provide a sealed plan set stamped by an

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engineer licensed in the state that the building is located for building department review.

- Q. One full round of sealed plan revisions are to be provided by the building supplier in the design and engineering services before additional fees apply.
- R. The building supplier shall submit complete, code compliant building plans including plans, elevations, sections, and details, under seal of a National Kitchen and Bathroom Association (NKBA) certified technical designer.
- S. The building supplier shall submit complete structural calculations meeting code loads, design loads, and seismic design under seal of a professional Engineer with current license in the state of California.
- T. Once submittal approval is received, three (3) wet stamped sets of plans and structural calculations shall be issued. Any additional plan sets and structural calculations can be obtained for a fee.
- U. The building supplier does not provide a final site plan.
- V. The reviewing authority reserves the right to review or reject all submittals at their sole discretion.
- W. All work and materials shall comply with the latest industry building codes and regulations for the state of California.
- X. Americans with Disabilities Act Accessibility Guidelines (ADAAG) will be followed in design, manufacture, and construction.
- Y. The specific supplier is indicated for each item. Building supplier, building installer, and owner supplied components are listed as such. Products not listed as building supplier or building installer supplied, are to be owner supplied.

1.03 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. The building supplier work shall include the design of the architectural, mechanical, structural, and electrical components that will be required for this building.
- C. The building will be designed as a complete, packaged building to be delivered to the job site to be constructed on site by the contractor.
- D. The building supplier will provide complete submittal documentation in the pre-engineered building suppliers standard submittal format for review.

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- E. The following sections shall be included in the building supplier's Scope of Supply and Design Submittal. Incomplete submittals will be rejected and returned to the bidder.
 - 1. INTRODUCTION
 - 2. BUILDING SUPPLIER PRODUCTS & SERVICES
 - 3. PRODUCTS & SERVICES NOT SUPPLIED BY BUILDING SUPPLIER
 - 4. WARRANTY & LIMITATIONS
 - 5. PROJECT DESIGN
 - 6. PRODUCT DATA SHEETS
- F. The building supplier will provide the building plan view and elevation with the Scope of Supply and Design Submittal (SSDIS) electronically for review and approval.
 - 1. The building supplier will revise the SSDS per the review comments.
 - 2. Once the design is approved, the building supplier will provide a sealed plan set stamped by an Engineer licensed in California for building department review.
 - 3. The building supplier will provide (2) sealed plan sets.
Note: Pricing allows for one revision in response to comments. Should additional revisions be requested, Romtec will provide a change order for the additional design work.
 - 4. The plan set standard size is 11" x 17".
Note: If a larger plan set size is required it will result in a price increase.
- G. The building supplier to supply O&M manuals if requested.

1.04 WARRANTY:

- A. The building and all its associated components will be warranted against defects in materials and workmanship for a period of not less than one (1) year from date of final acceptance. Acceptance is defined as the date of the delivery of the building and all its associated components or the date that the building and all its associated components are ready to deliver whichever comes first.

1.05 MAINTENANCE:

- A. The building supplier does not supply maintenance for the packaged trash enclosure.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. The building supplier freight shall be based on delivering the product on a 48' to 53' flatbed or van truck and trailers, or as close as they can legally get to

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the site. Overall dimensions of the truck and trailers shall be the following:
70' overall length, 102" wide and 168" high.

- B. The building package to arrive on organized pallets that are shrink wrapped and separated into stages for ease of installation. Bill of material stating stages of components to be included.
 - 1. Stage 1 pallets to include components such as block, frames, vents, beams, connectors, trusses, etc.
 - 2. Stage 2 pallets to include filler wall material, windows, skylights, roofing, etc.
 - 3. Stage 3 pallets to include siding material, tile, doors etc.
 - 4. Stage 4 pallets to include toilets, sinks, drinking fountains, electrical fixtures, accessories, etc.

1.07 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MANUFACTURERS:

- A. Romtec, Inc., 18240 North Bank Rd. Roseburg, OR. 97470 Tel: 541-496-3541; Fax: 541-496-0803; Email: cdooley@romtec.com Web: www.Romtec.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 1.

2.02 BUILDING DESCRIPTION:

- A. Refer to plans for quantities, dimensions, locations, and installation methods for the materials and items described in this section. The building supplier reserves the right to make substitutions of equivalent materials and items without notice.
- B. Building dimensions shall match what is indicated on drawings.

2.03 STRUCTURE:

- A. The following structural members to be supplied by building supplier.
- B. Concrete Masonry Units (CMU) shall be supplied by building supplier.

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1. Walls shall be constructed of 8"W x 16"L x 8"H smooth-face mortar joint concrete masonry units (concrete blocks).
 2. Blocks shall be manufactured to ASTM C90 designation for load bearing concrete masonry units.
 3. Note: The Building installer may be required to notch CMU block for bond beams, cut blocks to make the required shapes and/or grind block for fixture mounting.
 4. Block color shall be Gray.
- C. Removable 2x8 wood slats at each bay opening to be supplied by building supplier.

2.04 ROOFING:

- A. Shed style roof shall be supplied by building supplier.
1. Steel beams and posts.
 2. Tongue & groove decking shall be 2x6 V-edge deck boards, select deck Douglas fir.
- B. Roofing shall be Fabral, 29-gauge, Grand-Rib 3 roof panels with exposed fasteners.
1. Roofing package shall include inside and outside foam closures, matching trim (eaves, gables and ridge) and fasteners, sheet metal flashing (all sides), and 30# felt (under metal).
 2. Roofing color to be selected by the owner from the manufacturers standard color chart.

2.05 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS: CAST IN-PLACE CONCRETE:

- A. All equipment, labor, trades and materials shall be supplied by building installer.
1. Includes all materials and labor for foundations/footings, interior slabs, exterior/entry slabs, and sidewalks.
- B. Engineered fill shall be ¾" minus crushed aggregate around footings, foundations, and slabs as required.
- C. Slab vapor barrier shall be 6-mil continuous plastic under the concrete slab.
- D. The foundation shall be installed as designed with all cast in-place concrete poured to dimensions specified in final plans.
1. Footings will be built to 24" depth.

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2. Minimum compressive strength of 3000 psi at 28 days, 4+/-1" slump, with max 3/4" aggregate, cured in accordance with ACI 308.
 3. Slabs shall have a fine broom finish with joints required in flat work as shown on plans.
 4. Steel rebar shall be installed as specified in final plans.
- E. Concrete slab sealer shall be a water-based transparent curing, sealing and dust proofing compound with two (2) coats to be applied per manufacturer's instructions.
- F. Refer to drawings for sidewalks and entry slabs.
1. Minimum concrete compressive strength of 2500 psi at 28 days.
 2. Remesh or rebar reinforcement shall be used in sidewalks.
 3. All sidewalks shall be finished with a fine broom with control joints installed per engineer's specification.

2.06 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS:
STRUCTURE:

- A. Interior floors to be sealed concrete finish supplied by building installer.
- B. Sealant for all exposed wood shall be by building installer.

2.07 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS: OTHER
MATERIALS & EQUIPMENT:

- A. Unless otherwise specified, the following products and materials are NOT supplied by Romtec.
 1. All items not listed in Romtec Products.
 2. Any item listed as supplied by "installer", "contractor", "owner", or "others".
- B. Unless specified in the plans or submittals, Romtec does not supply the following:
 1. Building installation
 2. Asphalt paving
 3. Sidewalks
 4. Landscaping
 5. Site grading
 6. Cast-in-place concrete foundations, footings, interior slabs and exterior/entry slabs
 7. Concrete slab sealer
 8. Concrete grout

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9. Rebar
10. Typical fasteners; for example: roofing nails, staples, etc.
11. Fasteners not included in product packaging
12. Gutters and downspouts
13. Clear coat finish for all decking, glulam beams, posts, and extensions
14. All other items indicated on final plans or required by building codes which are not specifically stated as supplied by Romtec.

2.08 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS:
DELIVERY, STORAGE, AND HANDLING:

- A. The building installer will be responsible for all equipment and labor required for off-loading of the building onsite.
- B. The building installer will assume responsibility for adequate protection of materials from weather, damage, and pilferage or all warranties, expressed or implied may be voided.

PART 3 – EXECUTION

3.01 SPECIAL INSPECTION:

- A. If required, special inspection shall be owner supplied.
- B. If special inspection is required per the building department or other regulatory agencies, then the building supplier can assist but NOT provide this service.

3.02 INSTALLATION:

- A. All components to be installed according to the plan sets and/or manufacturer's instructions.

3.03 OPERATION & MAINTENANCE MANUALS:

- A. Upon installation, do not throw away the Operations & Maintenance manuals that are provided by some manufacturers in their packaging. Requests for additional copies from the building supplier will result in subsequent charges.

END OF SECTION

SECTION 13 34 23.20
PRE-ENGINEERED CONCESSION BUILDING

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. The work shall include furnishing the sealed architectural, structural, mechanical, and electrical plan sets as well as the structural, mechanical, and electrical building components as a complete, pre-designed packaged building as shown on drawings and as specified herein.

1.02 SCOPE:

- A. Packaged building and all associated design and engineering, with all listed components supplied by Romtec, Inc., hereafter designated as the building supplier. The building supplier shall be a single source design, engineering, and manufacturer who shall supply the packaged building and meet all the following scope requirements.
- B. The contractor is responsible for building installation, hereafter designated as the building installer. Building installer work will generally include: site preparation and grading, excavations for structures, backfill and/or structural backfill, foundation and pad construction, and building construction.
Note: Romtec Inc. does not serve as the building installer. Romtec Inc. is only the packaged building supplier.
- C. The packaged building should be the latest standard product of a building supplier regularly engaged and having at least ten (10) years of experience in packaged building engineering, design, supply, and construction.
- D. The building supplier must meet or exceed the product specification which was prepared using the Romtec Inc. building as a guide and example.
- E. Alternate building suppliers shall demonstrate that they have designed, engineered, produced, delivered, and constructed at minimum ten (10) other functioning site built buildings of similar type. Project completion date and a reference contact from the owner of each project must be provided.
- F. Alternate building suppliers must also disclose all instances of any prior municipal or landscape architect's rejection of the same or similar product as an "or equal" to the specified basis of design building package.
- G. Contractors wanting to propose an "or equal" building supplier other than Romtec Inc. are required to submit a complete submittal package with full sealed plan sets, calculations, and all pre-engineered structural items, ten (10) calendar days prior to the bid opening date. Any products proposed as "or equal" that are not as specified must be specifically listed and accompanied by the manufacturer's data sheets for review. This will be approved or denied prior to the bid opening. Incomplete submittals will be rejected and returned to the bidder.
- H. The building and its concrete footings, foundation, and slab are to be

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- engineered by the building supplier to meet site specific conditions including wind and snow loading, local frost depth, and ground conditions.
- I. Footings are to be dug by the building installer and poured on site to meet local code for permanent structures. A prefabricated, modular mat placed on compacted base is not an accepted equal to a site specific, site poured, engineered foundation.
 - J. Typical fasteners such as nails, staples, and screws shall be supplied by building installer. Atypical fasteners shall be supplied by building supplier.
 - K. Building is to be designed and constructed on site to meet local codes and approvals for permanent structures. Any building that is temporary, permanently relocatable, prefabricated modular, an offsite constructed product, or pre-cast is not an accepted equal to permanent, on site, conventional construction.
 - L. No outside entity approval will override the local building authority's codes and inspections. Seals meant for modular homes and production plant certifications will not be allowed in lieu of sealed plans from a licensed engineer and conventional inspection during construction.
 - M. The Romtec building package has been quoted with the specific product colors noted below. Changes to these color selections may result in a price increase.
 - N. Building sidings, treatments, and roofing are to be as specified. Precast buildings with painted textures are not to be considered architecturally equivalent.
 - O. Within one (1) week of contract award, the building supplier shall submit the packaged building preliminary Scope of Supply and Design Submittal (SSDS), including the building plan view and elevation drawings.
 - P. The SSDS is reviewed by the necessary parties and returned to the building supplier with any revisions to the contractual language, product data sheets, and/or building plan view and elevation drawings. Once the design is approved, the building supplier will provide a sealed plan set stamped by an engineer licensed in the state that the building is located for building department review.
 - Q. One full round of sealed plan revisions are to be provided by the building supplier in the design and engineering services before additional fees apply.
 - R. The building supplier shall submit complete, code compliant building plans including plans, elevations, sections, and details, under seal of a National Kitchen and Bathroom Association (NKBA) certified technical designer. The building supplier shall submit complete structural calculations meeting code loads, design loads, and seismic design under seal of a professional Engineer with current license in the state of California.
 - S. Once submittal approval is received, three (3) wet stamped sets of plans and structural calculations shall be issued. Any additional plan sets and structural calculations can be obtained for a fee.
 - T. The building supplier does not provide a final site plan.
 - U. The reviewing authority reserves the right to review or reject all submittals at their sole discretion.

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- V. All work and materials shall comply with the latest industry building codes and regulations for the state of California.
- W. Americans with Disabilities Act Accessibility Guidelines (ADAAG) will be followed in design, manufacture, and construction.
- X. The specific supplier is indicated for each item. Building supplier, building installer, and owner supplied components are listed as such. Products not listed as building supplier or building installer supplied, are to be owner supplied.

1.03 SUBMITTALS:

- A. The building supplier work shall include the design of the architectural, mechanical, structural, and electrical components that will be required for this building.
- B. The building will be designed as a complete, packaged building to be delivered to the job site to be constructed on site by the contractor.
- C. The building supplier will provide complete submittal documentation in the pre-engineered building suppliers standard submittal format for review.
- D. The following sections shall be included in the building supplier's Scope of Supply and Design Submittal. Incomplete submittals will be rejected and returned to the bidder.
 - 1. INTRODUCTION
 - 2. BUILDING SUPPLIER PRODUCTS & SERVICES
 - 3. PRODUCTS & SERVICES NOT SUPPLIED BY BUILDING SUPPLIER
 - 4. WARRANTY & LIMITATIONS
 - 5. PROJECT DESIGN
 - 6. PRODUCT DATA SHEETS
- E. The building supplier will provide the building plan view and elevation with the Scope of Supply and Design Submittal (SSDIS) electronically for review and approval.
 - 1. The building supplier will revise the SSDS per the review comments.
 - 2. Once the design is approved, the building supplier will provide a sealed plan set stamped by an Engineer licensed in California for building department review.
 - 3. The building supplier will provide (2) sealed plan sets.
Note: Pricing allows for one revision in response to comments. Should additional revisions be requested, Romtec will provide a change order for the additional design work.
 - 4. The plan set standard size is 11" x 17".
Note: If a larger plan set size is required it will result in a price increase.

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F. The building supplier to supply O&M manuals if requested.

1.04 DELIVERY, STORAGE, AND HANDLING:

- A. The building supplier freight shall be based on delivering the product on a 48' to 53' flatbed or van truck and trailers, or as close as they can legally get to the site. Overall dimensions of the truck and trailers shall be the following: 70' overall length, 102" wide and 168" high.
- B. The building package to arrive on organized pallets that are shrink wrapped and separated into stages for ease of installation. Bill of material stating stages of components to be included.
 - 1. Stage 1 pallets to include components such as block, frames, vents, beams, connectors, trusses, etc.
 - 2. Stage 2 pallets to include filler wall material, windows, skylights, roofing, etc.
 - 3. Stage 3 pallets to include siding material, tile, doors etc.
 - 4. Stage 4 pallets to include toilets, sinks, drinking fountains, electrical fixtures, accessories, etc.

1.05 WARRANTY:

- A. The building and all its associated components will be warranted against defects in materials and workmanship for a period of not less than one (1) year from date of final acceptance. Acceptance is defined as the date of the delivery of the building and all its associated components or the date that the building and all its associated components are ready to deliver whichever comes first.

1.06 MAINTENANCE:

- A. The building supplier does not supply maintenance for the packaged building.

1.07 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

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PART 2 – PRODUCTS

2.01 MANUFACTURERS:

- A. Romtec, Inc., 18240 North Bank Rd. Roseburg, OR. 97470. Tel: 541-496-3541; Fax: 541-496-0803; Email: cdooley@romtec.com Web: www.Romtec.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 1.

2.02 BUILDING DESCRIPTION:

- A. Refer to plans for quantities, dimensions, locations, and installation methods for the materials and items described in this section. The building supplier reserves the right to make substitutions of equivalent materials and items without notice.
- B. Building dimensions shall match what is indicated on drawings.

2.03 WALLS:

- A. Concrete Masonry Units (CMU) shall be supplied by building supplier.
 - 1. Walls shall be constructed of 8"W x 16"L x 8"H smooth-face mortar joint concrete masonry units (concrete blocks) with sealant.
 - 2. Blocks shall be manufactured to ASTM C90 designation for load bearing concrete masonry units.
Note: The Building installer may be required to notch CMU block for bond beams, cut blocks to make the required shapes and/or grind block for fixture mounting.
 - 3. Block color to be Gray.
- B. Rain Guard anti-graffiti coating supplied by building supplier.
- C. Exterior finish to be cedar board and batten siding with cobble field stone veneer accent supplied by building supplier.
- D. Interior of all exterior walls to have insulation finished with white FRP panels supplied by building supplier.
- E. Sanitary tile cover base on interior restroom walls supplied by building supplier.
- F. Stainless steel, 6'-8" x 4'-0" roll-up concession windows with service windows and stainless-steel counters supplied by building supplier.

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- G. Stainless steel countertop on either side of grill supplied by building supplier.

Note: Vented grill is by others.

- H. 6'-8" x 3'-4" windows with vinyl frames in banquet hall shall be supplied by building supplier.

- I. Door system components shall be supplied by building supplier.

1. Doors shall be Steelcraft® SL18 standard laminated honeycomb core and 18-gauge galvanized steel.
2. Door frame shall be pre-welded Steelcraft® 3-Sided flush frame, 16-gauge galvanized A-60 steel.
3. Masonry door clips (3/16" dia.) for door frame shall be fitted between the doorframe and concrete blocks to bond frame to wall. Door clips allow full internal grouting of the frame during installation.
4. Hinges shall meet ANSI A5112 with non-removable pin and two ball bearings.
5. Door closer shall have double heat-treated steel tempered springs, a triple heat-treated steel spindle and hold open arm.
6. Doors to have pull handles with deadbolt.
7. Double door and frame in banquet hall and concession room.
8. Concession room doors to have air curtains.

2.04 ROOFING:

- A. The following roof components shall be supplied by building supplier.

1. Trussed roof system with insulation.

- B. Roofing shall be Fabral, 26-gauge, Horizon 16, standing seam panels, with 16 in. coverage width.

1. Roofing package shall include inside and outside foam closures, matching trim (eaves, gables and ridge) and fasteners, sheet metal flashing (all sides), and 30# felt (under metal).
2. Roofing color to be selected by the owner from the manufacturers standard color chart.

2.05 PLUMBING FIXTURES AND ACCESSORIES:

- A. The following fixtures and accessories shall be supplied by building supplier.

- B. Toilet fixtures are fabricated using heavy gauge type 304 stainless steel, seamlessly welded to form a vandal resistant unit.

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1. Flush valve shall be a chrome, manual lever with ADA compliant metal oscillating non-hold-open handle.
- C. Lavatory is fabricated using heavy gauge type 304 stainless steel seamlessly welded to form a one piece, vandal resistant unit.
 1. Faucets shall be a 2.2gpm, pivot action lever style faucet.
- D. Grab bars shall be stainless steel.
- E. Toilet paper dispenser shall be stainless steel wall mount with two roll capacity.
- F. Surface-mounted napkin disposal shall be fabricated of 22 gauge stainless steel with exposed surfaces in satin finish, top attached by piano hinge.
- G. Surface-mounted towel dispenser shall be fabricated of type heavy duty, 22 gauge stainless steel with exposed surfaces in satin finish. Refill indicator on face of cabinet. Tumbler lock to secure hinged front panel. Towel dispenser capacity 525 multi-fold or 400 C-fold towels.
- H. Surface-mounted liquid soap dispenser shall be fabricated of 20-gauge satin finish stainless steel. Dispenser shall have completely concealed mounting, vandal resistant filler hole cover and sight gauge. Push-in corrosion- resistant liquid soap valve. Capacity: 40-oz. liquid soap.
- I. Surface-mounted baby changing station shall be solid light grey (9631) molded bacterial-resistant, high density polyethylene. Steel to steel support hinges with pneumatic gas shock mechanism. Unit shall have integrated liner dispenser and bag hooks. Unit shall have an anti-microbial safety belt. Unit shall be operable with less than 5lbs. of force and complies with ASTM F2285 Standard.
- J. Wall mounted drinking fountain constructed of #18 gauge, type 304, stainless steel polished to a satin finish.
- K. Mop sink in mechanical room shall be 24" x 24" with faucet.

2.06 SHOWER FIXTURES:

- A. The following shower fixtures shall be supplied by building supplier.
- B. Shower fixtures shall be thru wall coin-op showers with stainless steel shower panel.
 1. Vandal proof showerhead with ADA hand-shower with bracket and hose.
- C. Shower benches shall be steel framed with cedar slats.

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D. ADA phenolic fold-up shower benches.\

2.07 ELECTRICAL:

- A. The following electrical fixtures shall be supplied by building supplier.
- B. Light fixtures shall be supplied by building supplier.
 - 1. Exterior lights to be LED wall pack light fixtures with rugged cast-aluminum, corrosion-resistant rear mounting plate and impact resistant polycarbonate front cover/diffuser resists fading and cracking.
 - 2. Interior surface mount, 48" LED light fixtures.
 - 3. Lights controlled by motion sensor.
- C. Ceiling fans with interior lights in banquet hall shall be supplied by building supplier.
- D. Electric tank, 40-gallon, 4.5kw water heater supplied by building supplier.
- E. HVAC system supplied by building supplier.
- F. Mechanical exhaust system supplied by building supplier.
- G. Main breaker panel shall be supplied by building supplier.
 - 1. Breaker Panel shall be 200 Amp, single-phase.
Note: This panel has been sized to accept only the loads of the building supplier electrical fixture package. The building supplier has the right to modify the main breaker panel to be most efficient based on any changes.

2.08 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS: CAST IN-PLACE CONCRETE:

- A. All equipment, labor, trades and materials shall be supplied by building installer.
 - 1. Includes all materials and labor for foundations/footings, interior slabs, exterior/entry slabs, and sidewalks.
- B. Engineered fill shall be ¾" minus crushed aggregate around footings, foundations, and slabs as required.
- C. Slab vapor barrier shall be 6-mil continuous plastic under the concrete slab.
- D. The foundation shall be installed as designed with all cast in-place concrete poured to dimensions specified in final plans.

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1. Footings will be built to 24" depth.
 2. Minimum compressive strength of 3000 psi at 28 days, 4+/-1" slump, with max ¾" aggregate, cured in accordance with ACI 308.
 3. Slabs shall have a fine broom finish with joints required in flat work as shown on plans.
 4. Steel rebar shall be installed as specified in final plans.
- E. Concrete slab sealer shall be a water-based transparent curing, sealing and dust proofing compound with two (2) coats to be applied per manufacturer's instructions.
- F. Refer to drawings for sidewalks and entry slabs.
1. Minimum concrete compressive strength of 2500 psi at 28 days.
 2. Remesh or rebar reinforcement shall be used in sidewalks.
 3. All sidewalks shall be finished with a fine broom with control joints installed per engineer's specification.
- G. Moisture barrier for concrete slab.

2.09 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS:
STRUCTURE:

- A. Masonry (concrete) grout shall be supplied by building installer.
1. Grout shall have a minimum compressive strength of 2500 psi at 28 days, 9+/-1" slump, with max ½" aggregate.
 2. Fine or coarse grout may be used in accordance with 2009 UBC.
 3. All CMU must be fully grouted and may not be wetted.
- B. Rebar in walls shall be supplied by building installer.
1. All walls have # 4 and # 5 rebar, see plans for spacing.
 2. All rebar used in building must meet ASTM A615 manufacturing standards and is to be placed per plans.
- C. Interior block wall finish to be latex epoxy paint supplied by building installer.
- D. Ceiling finish to be supplied by building installer.
- E. Interior floors to be sealed concrete finish supplied by building installer.
- F. Sealant for all exposed wood shall be supplied by building installer.
- G. Shelving in storage area is by building installer.
- H. Wall cabinets commercial grade solid plywood framed is by building installer.

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- I. Grease trap is supplied and installed by building installer.
- J. Building installer to finish/paint exterior siding and all interior walls with sealer or primer.

Note: Color to be selected by County Parks Project Manager.

2.10 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS:
ELECTRICAL:

- A. Unless otherwise specified, the following products and materials are NOT supplied by Romtec.
 - 1. All items not listed in Romtec Products.
 - 2. Any item listed as supplied by “installer”, “contractor”, “owner”, or “others”.
- B. Unless specified in the plans or submittals, Romtec does not supply the following:
 - 1. Building installation
 - 2. Asphalt paving
 - 3. Masonry pavers
 - 4. Sidewalks
 - 5. Landscaping
 - 6. Site grading
 - 7. Cast-in-place concrete foundations, footings, interior slabs and exterior/entry slabs
 - 8. Concrete slab sealer
 - 9. Mortar
 - 10. Concrete grout
 - 11. Rebar
 - 12. Latex epoxy paint
 - 13. Caulk for siding
 - 14. Plumbing rough in, installation and trim
 - 15. Electrical rough in, installation and trim
 - 16. Drain valves and backflow check valves
 - 17. Branch circuit breakers
 - 18. Switches & outlets
 - 19. Typical fasteners; for example: roofing nails, staples, etc.
 - 20. Fasteners not included in product packaging
 - 21. Irrigation Equipment
 - 22. Gutters and downspouts
 - 23. Fire alarm and fire suppression equipment
 - 24. Lighting equipment not attached to the building
 - 25. Clear coat finish for all decking, glulam beams, posts, and extensions

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26. All other items indicated on final plans or required by building codes which are not specifically stated as supplied by Romtec.

2.11 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS:
DELIVERY, STORAGE, AND HANDLING:

- A. The building installer will be responsible for all equipment and labor required for off-loading of the building onsite.

The building installer will assume responsibility for adequate protection of materials from weather, damage, and pilferage or all warranties, expressed or implied may be voided.

PART 3 – EXECUTION

3.01 SPECIAL INSPECTION:

- A. If required, special inspection shall be owner supplied.
- B. If special inspection is required per the building department or other regulatory agencies, then the building supplier can assist but NOT provide this service.

3.02 INSTALLATION:

- A. All components to be installed according to the plan sets and/or manufacturer's instructions.

3.03 OPERATION & MAINTENANCE MANUALS:

- A. Upon installation, do not throw away the Operations & Maintenance manuals that are provided by some manufacturers in their packaging. Requests for additional copies from the building supplier will result in subsequent charges.

END OF SECTION

SECTION 13 34 23.40
PRE-ENGINEERED RESTROOM BUILDING

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. The work shall include furnishing the sealed architectural, structural, mechanical, and electrical plan sets as well as the structural, mechanical, and electrical building components as a complete, pre-designed packaged restroom building as shown on drawings and as specified herein.

1.02 SCOPE:

- A. Packaged restroom building and all associated design and engineering, with all listed components supplied by Romtec, Inc., hereafter designated as the building supplier. The building supplier shall be a single source design, engineering, and manufacturer who shall supply the packaged restroom building and meet all the following scope requirements.
- B. The contractor is responsible for building installation, hereafter designated as the building installer. Building installer work will generally include: site preparation and grading, excavations for structures, backfill and/or structural backfill, foundation and pad construction, and building construction.

Note: Romtec Inc. does not serve as the building installer. Romtec Inc. is only the packaged restroom building supplier.

- C. The packaged restroom building should be the latest standard product of a building supplier regularly engaged and having at least ten (10) years of experience in packaged restroom building engineering, design, supply, and construction.
- D. The building supplier must meet or exceed the product specification which was prepared using the Romtec Inc. building as a guide and example.
- E. Alternate building suppliers shall demonstrate that they have designed, engineered, produced, delivered, and constructed at minimum ten (10) other functioning site-built restroom buildings of similar type. Project completion date and a reference contact from the owner of each project must be provided.
- F. Alternate building suppliers must also disclose all instances of any prior municipal or landscape architect's rejection of the same or similar product as an "or equal" to the specified basis of design building package.
- G. Contractors wanting to propose an "or equal" building supplier other than Romtec Inc. are required to submit a complete submittal package with full

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sealed plan sets, calculations, and all pre-engineered structural items, ten (10) calendar days prior to the bid opening date. Any products proposed as “or equal” that are not as specified must be specifically listed and accompanied by the manufacturer’s data sheets for review. This will be approved or denied prior to the bid opening. Incomplete submittals will be rejected and returned to the bidder.

- H. The building and its concrete footings, foundation, and slab are to be engineered by the building supplier to meet site specific conditions including wind and snow loading, local frost depth, and ground conditions.
- I. Footings are to be dug by the building installer and poured on site to meet local code for permanent structures. A prefabricated, modular mat placed on compacted base is not an accepted equal to a site specific, site poured, engineered foundation.
- J. Typical fasteners such as nails, staples, and screws shall be supplied by building installer. Atypical fasteners shall be supplied by building supplier.
- K. Building is to be designed and constructed on site to meet local codes and approvals for permanent structures. Any building that is temporary, permanently relocatable, prefabricated modular, an offsite constructed product, or pre-cast is not an accepted equal to permanent, on site, conventional construction.
- L. No outside entity approval will override the local building authority’s codes and inspections. Seals meant for modular homes and production plant certifications will not be allowed in lieu of sealed plans from a licensed engineer and conventional inspection during construction.
- M. The Romtec building package has been quoted with the specific product colors noted below. Changes to these color selections may result in a price increase.
- N. Building sidings, treatments, and roofing are to be as specified. Precast buildings with painted textures are not to be considered architecturally equivalent.
- O. Within one (1) week of contract award, the building supplier shall submit the packaged building preliminary Scope of Supply and Design Submittal (SSDS), including the building plan view and elevation drawings.
- P. The SSDS is reviewed by the necessary parties and returned to the building supplier with any revisions to the contractual language, product data sheets, and/or building plan view and elevation drawings. Once the design is approved, the building supplier will provide a sealed plan set stamped by an

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engineer licensed in the state that the building is located for building department review.

- Q. One full round of sealed plan revisions are to be provided by the building supplier in the design and engineering services before additional fees apply.
- R. The building supplier shall submit complete, code compliant building plans including plans, elevations, sections, and details, under seal of a National Kitchen and Bathroom Association (NKBA) certified technical designer.
- S. The building supplier shall submit complete structural calculations meeting code loads, design loads, and seismic design under seal of a professional Engineer with current license in the state of California.
- T. Once submittal approval is received, three (3) wet stamped sets of plans and structural calculations shall be issued. Any additional plan sets and structural calculations can be obtained for a fee.
- U. The building supplier does not provide a final site plan.
- V. The reviewing authority reserves the right to review or reject all submittals at their sole discretion.
- W. All work and materials shall comply with the latest industry building codes and regulations for the state of California.
- X. Americans with Disabilities Act Accessibility Guidelines (ADAAG) will be followed in design, manufacture, and construction.
- Y. The specific supplier is indicated for each item. Building supplier, building installer, and owner supplied components are listed as such. Products not listed as building supplier or building installer supplied, are to be owner supplied.

1.03 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. The building supplier work shall include the design of the architectural, mechanical, structural, and electrical components that will be required for this building.
- C. The building will be designed as a complete, packaged building to be delivered to the job site to be constructed on site by the contractor.
- D. The building supplier will provide complete submittal documentation in the pre-engineered building suppliers standard submittal format for review.

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- E. The following sections shall be included in the building supplier's Scope of Supply and Design Submittal. Incomplete submittals will be rejected and returned to the bidder.
1. INTRODUCTION
 2. BUILDING SUPPLIER PRODUCTS & SERVICES
 3. PRODUCTS & SERVICES NOT SUPPLIED BY BUILDING SUPPLIER
 4. WARRANTY & LIMITATIONS
 5. PROJECT DESIGN
 6. PRODUCT DATA SHEETS
- F. The building supplier will provide the building plan view and elevation with the Scope of Supply and Design Submittal (SSDIS) electronically for review and approval.
1. The building supplier will revise the SSDS per the review comments.
 2. Once the design is approved, the building supplier will provide a sealed plan set stamped by an Engineer licensed in California for building department review.
 3. The building supplier will provide (2) sealed plan sets.
Note: Pricing allows for one revision in response to comments. Should additional revisions be requested, Romtec will provide a change order for the additional design work.
 4. The plan set standard size is 11" x 17".
Note: If a larger plan set size is required it will result in a price increase.
- G. The building supplier to supply O&M manuals if requested.

1.04 WARRANTY:

- A. The building and all its associated components shall be warranted against defects in materials and workmanship for a period of not less than one (1) year from date of final acceptance.

1.05 MAINTENANCE:

- A. The building supplier does not supply maintenance for the packaged restroom building.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. The building supplier freight shall be based on delivering the product on a 48' to 53' flatbed or van truck and trailers, or as close as they can legally get to

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the site. Overall dimensions of the truck and trailers shall be the following:
70' overall length, 102" wide and 168" high.

- B. The building package to arrive on organized pallets that are shrink wrapped and separated into stages for ease of installation. Bill of material stating stages of components to be included.
 - 1. Stage 1 pallets to include components such as block, frames, vents, beams, connectors, trusses, etc.
 - 2. Stage 2 pallets to include filler wall material, windows, skylights, roofing, etc.
 - 3. Stage 3 pallets to include siding material, tile, doors etc.
 - 4. Stage 4 pallets to include toilets, sinks, drinking fountains, electrical fixtures, accessories, etc

1.07 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS -
DELIVERY, STORAGE, AND HANDLING:

- A. The building installer will be responsible for all equipment and labor required for off-loading of the building onsite.
- B. The building installer will assume responsibility for adequate protection of materials from weather, damage, and pilferage or all warranties, expressed or implied may be voided.

1.08 OPERATION & MAINTENANCE MANUALS

- A. Upon installation, do not throw away the Operations & Maintenance manuals that are provided by some manufacturers in their packaging. Requests for additional copies from the building supplier will result in subsequent charges.

PART 2 – PRODUCTS

2.01 MANUFACTURERS:

- A. Romtec, Inc., 18240 North Bank Rd. Roseburg, OR. 97470. Tel: 541-496-3541; Fax: 541-496-0803; Email: cdooley@romtec.com Web: www.Romtec.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 1.

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2.02 BUILDING DESCRIPTION:

- A. Refer to plans for quantities, dimensions, locations, and installation methods for the materials and items described in this section. The building supplier reserves the right to make substitutions of equivalent materials and items without notice.
- B. Building dimensions shall match what is indicated on drawings.

2.03 WALLS:

- A. Concrete Masonry Units (CMU) shall be supplied by building supplier.
 - 1. Walls shall be constructed of 8"W x 16"L x 8"H smooth-face mortar joint concrete masonry units (concrete blocks).
 - 2. Blocks shall be manufactured to ASTM C90 designation for load bearing concrete masonry units.
Note: The Building installer may be required to notch CMU block for bond beams, cut blocks to make the required shapes and/or grind block for fixture mounting.
 - 3. Block color shall be Gray.
- B. Exterior finish shall be cedar board and batten siding with cobble stone type accent supplied by building supplier.
- C. Rain Guard anti-graffiti coating to be supplied by building supplier.
- D. Interior wall finish shall be Tamoseal supplied by building supplier.
- E. Rubber cove base on interior restroom walls shall be supplied by building supplier.
- F. Wire weave gable vents for natural ventilation shall be supplied by building supplier.
 - 1. Pre-assembled steel frame with 10-gauge, 1" square lock joint wire weave mesh and interior louver with integral insect screen.
 - 2. Vents powder coated black.
- G. Door system components shall be supplied by building supplier.
 - 1. Door shall be Steelcraft® SZ18 standard laminated polystyrene-core, 18-gauge galvanized steel.
 - 2. Door frame shall be pre-welded Steelcraft® 3-Sided flush frame, 16-gauge galvanized A-60 steel.
 - 3. Masonry door clips (3/16" dia.) for door frame shall be fitted between the doorframe and concrete blocks to bond frame to wall. Door clips allow full internal grouting of the frame during installation.

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4. Hinges shall be ANSI A5112 with non-removable pin and two ball bearings.
 5. Door closer shall have double heat-treated steel tempered springs, a triple heat-treated steel spindle and hold open arm.
 6. Door locks shall be pull handles with deadbolt locks.
- H. Bradley phenolic restroom partitions shall be supplied by building supplier.
1. Solid Phenolic core is composed of compressed cellulose fibers impregnated with resins. The surface laminate is fused to the resin-impregnated core. All edges are machined and finished smooth with a 15- degree beveled edge. Material will not delaminate even under extreme conditions. Materials are non- absorbent, impact and graffiti resistant. Materials are impervious to steam, soaps and detergents and will not mildew.
 2. Partition color shall be Graphite Grafix (006F).

2.04 ROOFING:

- A. Roof shall be supplied by building supplier.
1. Glulam beams shall be 24F-V4 and architectural grade.
 2. Tongue & groove decking shall be 2x6 V-edge deck boards, select deck Douglas fir.
- B. Roofing shall be Fabral, 26-gauge, Horizon 16 standing seam panels, with 16 in. coverage width.
1. Roofing package shall include inside and outside foam closures, matching trim (eaves, gables and ridge) and fasteners, sheet metal flashing (all sides), and 30# felt (under metal).
 2. Roofing color to be shall be selected by owner from the manufacturers standard color chart.

2.05 RESTROOM FIXTURES & ACCESSORIES:

- A. The following restroom fixtures and accessories shall be supplied by building supplier.
- B. Toilets shall be wall mounted, top supply, 304 stainless steel and seamlessly welded, vandal resistant unit with stainless steel internal piping.
1. Flush valve shall be a chrome, low flow, manual lever with ADA compliant metal oscillating non-hold- open handle.

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- C. Urinals shall be wall mount, fabricated of 18 gauge with 16-gauge bowl type 304 stainless steel with exposed surfaces polished to a satin finish.
 - 1. Flush valve shall be a chrome, low flow, manual lever with ADA compliant metal oscillating non-hold- open handle.
- D. Lavatory shall be a stainless steel and wall mounted and ADA compliant.
 - 1. Faucets shall be a 2.2gpm, pivot action, low flow, lever style faucet.
- E. Grab bars shall be stainless steel.
- F. Toilet paper dispenser shall be stainless steel, wall mount with two roll capacity.
- G. Surface-mounted napkin disposal shall be fabricated of 22-gauge stainless steel with exposed surfaces in satin finish. Top attached by piano hinge.
- H. Surface-mounted liquid soap dispenser shall be fabricated of 20-gauge satin finish stainless steel. Dispenser shall have completely concealed mounting, vandal resistant filler hole cover and sight gauge. Push-in corrosion- resistant liquid soap valve. Capacity: 40-oz. liquid soap.
- I. Surface-mounted baby changing station shall be solid light grey (9631) molded bacterial-resistant, high density polyethylene. Steel to steel support hinges with pneumatic gas shock mechanism. Unit shall have integrated liner dispenser and bag hooks. Unit shall have an anti-microbial safety belt. Unit shall be operable with less than 5 lbs. of force and complies with ASTM F2285 Standard.
- J. Wall mounted drinking fountain constructed of #18-gauge, type 304, stainless steel polished to a satin finish. Contoured basin minimizes splashing and has exclusive Flexi-Guard® safety bubbler. Easy to operate, fully functional push-button is vandal resistant. Stainless steel bottom cover plate included. Flow regulator provides constant stream from 20 to 105 psi water pressure.
 - 1. Drinking fountain to have remote type, electric refrigerated, water chiller unit. Chilling capacity of 2.5 gallons per hour of 50-degree drinking water, based upon 80-degree inlet water and 90 degree ambient.

2.06 ELECTRICAL:

- A. Interior and exterior light fixtures shall be supplied by building supplier.

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1. Exterior lights to be LED wall pack light fixtures with rugged cast-aluminum, corrosion-resistant rear mounting plate and impact resistant polycarbonate front cover/diffuser resists fading and cracking.
 2. Interior surface mount, 48" LED light fixtures.
 3. Lights controlled by motion sensor.
- B. Electric tank, 40 gallons, 4.5kw water heater shall be supplied by building supplier.
- C. Fire sprinkler system and illuminated fire exit signs are by others.
- D. Main breaker panel shall be supplied by building supplier.
1. Breaker Panel shall be 200 Amp, single-phase.
Note: This panel has been sized to accept only the loads of the building supplier electrical fixture package. The building supplier has the right to modify the main breaker panel to be most efficient based on any changes.

2.07 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS: CAST IN-PLACE CONCRETE:

- A. All equipment, labor, trades and materials shall be supplied by building installer.
1. Includes all materials and labor for foundations/footings, interior slabs, exterior/entry slabs, and sidewalks.
- B. Engineered fill shall be ¾" minus crushed aggregate around footings, foundations, and slabs as required.
- C. Slab vapor barrier shall be 6-mil continuous plastic under the concrete slab.
- D. The foundation shall be installed as designed with all cast in-place concrete poured to dimensions specified in final plans.
1. Footings will be built to 24" depth.
 2. Minimum compressive strength of 3000 psi at 28 days, 4+/-1" slump, with max ¾" aggregate, cured in accordance with ACI 308.
 3. Slabs shall have a fine broom finish with joints required in flat work as shown on plans.
 4. Steel rebar shall be installed as specified in final plans.

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- E. Concrete slab sealer shall be a water-based transparent curing, sealing and dust proofing compound with two (2) coats to be applied per manufacturer's instructions.
- F. Refer to drawings for sidewalks and entry slabs.
 - 1. Minimum concrete compressive strength of 2500 psi at 28 days.
 - 2. Remesh or rebar reinforcement shall be used in sidewalks.
 - 3. All sidewalks shall be finished with a fine broom with control joints installed per engineer's specification.

2.08 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS -
STRUCTURE:

- A. Masonry (concrete) grout shall be supplied by building installer.
 - 1. Grout shall have a minimum compressive strength of 2500 psi at 28 days, 9+/-1" slump, with max 1/2" aggregate.
 - 2. Fine or coarse grout may be used in accordance with 2009 UBC.
 - 3. All CMU must be fully grouted and may not be wetted.
- B. Rebar in walls shall be supplied by building installer.
 - 1. All walls have # 4 and # 5 rebar, see plans for spacing.
 - 2. All rebar used in building must meet ASTM A615 manufacturing standards and is to be placed per plans.
- C. Interior floors to be sealed concrete finish supplied by building installer.
- D. Doors and frames are primed to be painted on-site by building installer.
- E. Sealant for cedar board and batten siding is by building installer.
- F. Sealant for all exposed wood shall be supplied by building installer.

2.09 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS -
PLUMBING:

- A. Plumbing rough-in, installation and trim shall be supplied by building installer.
 - 1. All underground water service and sewer drain(s) from building to be as specified in final site plan.
 - 2. All floor drains shall be as shown on final building plans.

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3. Building water shutoff valve, drain, and all rough piping shall be as shown on final building plans. Final location to be set onsite.
 4. Minimum water pressure at toilet and urinal flush valves shall be 40 psi. with minimum pipe sizing as per 2009 Uniform Plumbing Code Section 610.
 5. Install the supplied fixtures and all other plumbing supplies as specified in final plans.
- B. Floor drains shall be supplied by building installer.
- C. Water line drain valve shall be supplied by building installer.
- D. Sewer line backflow check valve shall be supplied by building installer.

2.10 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS - ELECTRICAL:

- A. Electrical rough-in, installation and trim shall be supplied by building installer.
1. All underground and/or overhead service to building shall be as specified in the final site plan.
 2. Electric meter base and all rough wiring, switches, plugs and circuit breakers shall be as shown on final plans. The building supplier does not supply the meter base and meter.
 3. Building installer is responsible for all necessary wire, connectors, grounding, conduit etc. to install the components and meet national and local code. The installation of these components shall comply with all state and/or local codes.
- B. Fire sprinkler system and illuminated fire exit signs are by others.

2.11 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS - OTHER MATERIALS & EQUIPMENT:

- A. Unless otherwise specified, the following products and materials are NOT supplied by Romtec.
1. All items not listed in Romtec Products.
 2. Any item listed as supplied by “installer”, “contractor”, “owner”, or “others”.
- B. Unless specified in the plans or submittals, Romtec does not supply the following:

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1. Building installation
2. Asphalt paving
3. Masonry pavers
4. Sidewalks
5. Landscaping
6. Site grading
7. Cast-in-place concrete foundations, footings, interior slabs and exterior/entry slabs
8. Concrete slab sealer
9. Mortar
10. Concrete grout
11. Rebar
12. Latex epoxy paint
13. Caulk for siding
14. Plumbing rough in, installation and trim
15. Electrical rough in, installation and trim
16. Drain valves and backflow check valves
17. Branch circuit breakers
18. Switches & outlets
19. Typical fasteners; for example, roofing nails, staples, etc.
20. Fasteners not included in product packaging
21. Irrigation Equipment
22. Gutters and downspouts
23. Fire alarm and fire suppression equipment
24. Lighting equipment not attached to the building
25. Clear coat finish for all decking, glulam beams, posts, and extensions
26. All other items indicated on final plans or required by building codes which are not specifically stated as supplied by Romtec.

PART 3 – EXECUTION

3.01 SPECIAL INSPECTION

- A. If required, special inspection shall be owner supplied.
- B. If special inspection is required per the building department or other regulatory agencies, then the building supplier can assist but NOT provide this service.

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3.02 INSTALLATION

- A. All components to be installed according to the plan sets and/or manufacturer's instructions.

END OF SECTION

SECTION 13 34 23.50
PRE-ENGINEERED SHOP BUILDING

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. The work shall include furnishing the sealed architectural, structural, mechanical, and electrical plan sets as well as the structural, mechanical, and electrical building components as a complete, pre-designed packaged building as shown on drawings and as specified herein.

1.02 SCOPE:

- A. Packaged building and all associated design and engineering, with all listed components supplied by Romtec, Inc., hereafter designated as the building supplier. The building supplier shall be a single source design, engineering, and manufacturer who shall supply the packaged building and meet all the following scope requirements.

- B. The contractor is responsible for building installation, hereafter designated as the building installer. Building installer work will generally include site preparation and grading, excavations for structures, backfill and/or structural backfill, foundation and pad construction, and building construction.

Note: Romtec Inc. does not serve as the building installer. Romtec Inc. is only the packaged building supplier.

- C. The packaged building should be the latest standard product of a building supplier regularly engaged and having at least ten (10) years of experience in packaged building engineering, design, supply, and construction.
- D. The building supplier must meet or exceed the product specification which was prepared using the Romtec Inc. building as a guide and example.
- E. Alternate building suppliers shall demonstrate that they have designed, engineered, produced, delivered, and constructed at minimum ten (10) other functioning site-built buildings of similar type. Project completion date and a reference contact from the owner of each project must be provided.
- F. Alternate building suppliers must also disclose all instances of any prior municipal or landscape architect's rejection of the same or similar product as an "or equal" to the specified basis of design building package.
- G. Contractors wanting to propose an "or equal" building supplier other than Romtec Inc. are required to submit a complete submittal package with full

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sealed plan sets, calculations, and all pre-engineered structural items, ten (10) calendar days prior to the bid opening date. Any products proposed as “or equal” that are not as specified must be specifically listed and accompanied by the manufacturer’s data sheets for review. This will be approved or denied prior to the bid opening. Incomplete submittals will be rejected and returned to the bidder.

- H. The building and its concrete footings, foundation, and slab are to be engineered by the building supplier to meet site specific conditions including wind and snow loading, local frost depth, and ground conditions.
- I. Footings are to be dug by the building installer and poured on site to meet local code for permanent structures. A prefabricated, modular mat placed on compacted base is not an accepted equal to a site specific, site poured, engineered foundation.
- J. Typical fasteners such as nails, staples, and screws shall be supplied by building installer. Atypical fasteners shall be supplied by building supplier.
- K. Building is to be designed and constructed on site to meet local codes and approvals for permanent structures. Any building that is temporary, permanently relocatable, prefabricated modular, an offsite constructed product, or pre-cast is not an accepted equal to permanent, on site, conventional construction.
- L. No outside entity approval will override the local building authority’s codes and inspections. Seals meant for modular homes and production plant certifications will not be allowed in lieu of sealed plans from a licensed engineer and conventional inspection during construction.
- M. The Romtec building package has been quoted with the specific product colors noted below. Changes to these color selections may result in a price increase.
- N. Building sidings, treatments, and roofing are to be as specified. Precast buildings with painted textures are not to be considered architecturally equivalent.
- O. Within one (1) week of contract award, the building supplier shall submit the packaged building preliminary Scope of Supply and Design Submittal (SSDS), including the building plan view and elevation drawings.
- P. The SSDS is reviewed by the necessary parties and returned to the building supplier with any revisions to the contractual language, product data sheets, and/or building plan view and elevation drawings. Once the design is approved, the building supplier will provide a sealed plan set stamped by an

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engineer licensed in the state that the building is located for building department review.

- Q. One full round of sealed plan revisions are to be provided by the building supplier in the design and engineering services before additional fees apply.
- R. The building supplier shall submit complete, code compliant building plans including plans, elevations, sections, and details, under seal of a National Kitchen and Bathroom Association (NKBA) certified technical designer.
- S. The building supplier shall submit complete structural calculations meeting code loads, design loads, and seismic design under seal of a professional Engineer with current license in the state of California.
- T. Once submittal approval is received, three (3) wet stamped sets of plans and structural calculations shall be issued. Any additional plan sets and structural calculations can be obtained for a fee.
- U. The building supplier does not provide a final site plan.
- V. The reviewing authority reserves the right to review or reject all submittals at their sole discretion.
- W. All work and materials shall comply with the latest industry building codes and regulations for the state of California.
- X. Americans with Disabilities Act Accessibility Guidelines (ADAAG) will be followed in design, manufacture, and construction.
- Y. The specific supplier is indicated for each item. Building supplier, building installer, and owner supplied components are listed as such. Products not listed as building supplier or building installer supplied, are to be owner supplied.

1.03 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. The building supplier work shall include the design of the architectural, mechanical, structural, and electrical components that will be required for this building.
- C. The building will be designed as a complete, packaged building to be delivered to the job site to be constructed on site by the contractor.
- D. The building supplier will provide complete submittal documentation in the pre-engineered building suppliers standard submittal format for review.

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- E. The following sections shall be included in the building supplier's Scope of Supply and Design Submittal. Incomplete submittals will be rejected and returned to the bidder.
1. INTRODUCTION
 2. BUILDING SUPPLIER PRODUCTS & SERVICES
 3. PRODUCTS & SERVICES NOT SUPPLIED BY BUILDING SUPPLIER
 4. WARRANTY & LIMITATIONS
 5. PROJECT DESIGN
 6. PRODUCT DATA SHEETS
- F. The building supplier will provide the building plan view and elevation with the Scope of Supply and Design Submittal (SSDIS) electronically for review and approval.
1. The building supplier will revise the SSDS per the review comments.
 2. Once the design is approved, the building supplier will provide a sealed plan set stamped by an Engineer licensed in California for building department review.
 3. The building supplier will provide (2) sealed plan sets.
Note: Pricing allows for one revision in response to comments. Should additional revisions be requested, Romtec will provide a change order for the additional design work.
 4. The plan set standard size is 11" x 17".
Note: If a larger plan set size is required it will result in a price increase.
- G. The building supplier to supply O&M manuals if requested.

1.04 WARRANTY:

- A. The building and all its associated components shall be warranted against defects in materials and workmanship for a period of not less than one (1) year from date of final acceptance.

1.05 MAINTENANCE:

- A. The building supplier does not supply maintenance for the packaged building.

1.06 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 APPROVED MANUFACTURERS:

Romtec, Inc., 18240 North Bank Rd. Roseburg, OR. 97470. Tel: 541-496-3541; Fax: 541-496-0803; Email: cdooley@romtec.com Web: www.Romtec.com

- A. Requests for substitutions will be considered in accordance with provisions of Section 1.

2.02 BUILDING DESCRIPTION:

- A. Refer to plans for quantities, dimensions, locations, and installation methods for the materials and items described in this section. The building supplier reserves the right to make substitutions of equivalent materials and items without notice.
- B. Building dimensions shall match what is indicated on drawings.

2.03 STRUCTURE:

- A. Concrete Masonry Units (CMU) shall be supplied by building supplier.
 - 1. Walls shall be constructed of 8"W x 16"L x 8"H smooth-face mortar joint concrete masonry units (concrete blocks).
 - 2. Blocks shall be manufactured to ASTM C90 designation for load bearing concrete masonry units.
Note: The Building installer may be required to notch CMU block for bond beams, cut blocks to make the required shapes and/or grind block for fixture mounting.
 - 3. Block color shall be Gray.
- B. Rain Guard anti-graffiti coating shall be supplied by building supplier.
- C. Exterior finish shall be cedar board and batten siding with cobble stone accent supplied by building supplier.
- D. Door system components shall be supplied by building supplier.
 - 1. Door shall be Steelcraft® SZ18 standard laminated polystyrene-core, 18-gauge galvanized steel.
 - 2. Door frame shall be pre-welded Steelcraft® 3-Sided flush frame, 16-gauge galvanized A-60 steel.
 - 3. Doors and frames are primed and painted black.

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4. Masonry door clips (3/16" dia.) for door frame shall be fitted between the doorframe and concrete blocks to bond frame to wall. Door clips allow full internal grouting of the frame during installation.
 5. Hinges shall be ANSI A5112 with non-removable pin and two ball bearings.
 6. Door closer shall have double heat-treated steel tempered springs, a triple heat treated steel spindle and hold open arm.
 7. Door lock shall be Grade 2, standard duty commercial cylindrical lever locks with no exposed mounting screws.
- E. Roll-up white utility doors to be 12'-0" x 12'-0" supplied by building supplier.

2.04 ROOFING:

- A. Roof shall be supplied by building supplier.
1. Trussed roofing system
- B. Roofing shall be Fabral, 26-gauge, Horizon 16 standing seam panels, with 16 in. coverage width.
1. Roofing package shall include inside and outside foam closures, matching trim (eaves, gables and ridge) and fasteners, sheet metal flashing (all sides), and 30# felt (under metal).
 2. Roofing color to be shall be selected by owner from the manufacturers standard color chart.

2.05 PLUMBING:

- A. The following plumbing fixtures shall be supplied by building supplier.
- B. Utilitub17 with legs and ADA faucet.

2.06 ELECTRICAL:

- A. Light fixtures shall be supplied by building supplier.
1. Exterior lights to be LED wall pack light fixtures with rugged cast-aluminum, corrosion-resistant rear mounting plate and impact resistant polycarbonate front cover/diffuser resists fading and cracking.
 2. Interior surface mount, 48" LED light fixtures.
- B. Main breaker panel shall be supplied by building supplier.

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1. Breaker Panel shall be 100 Amp, single-phase.
2. Note: This panel has been sized to accept only the loads of the building supplier electrical fixture package. The building supplier has the right to modify the main breaker panel to be most efficient based on any changes.

2.07 DELIVERY, STORAGE, AND HANDLING:

- A. The building supplier freight shall be based on delivering the product on a 48' to 53' flatbed or van truck and trailers, or as close as they can legally get to the site. Overall dimensions of the truck and trailers shall be the following: 70' overall length, 102" wide and 168" high.
- B. The building package to arrive on organized pallets that are shrink wrapped and separated into stages for ease of installation. Bill of material stating stages of components to be included.
 1. Stage 1 pallets to include components such as block, frames, vents, beams, connectors, trusses, etc.
 2. Stage 2 pallets to include filler wall material, windows, skylights, roofing, etc.
 3. Stage 3 pallets to include siding material, tile, doors etc.
 4. Stage 4 pallets to include toilets, sinks, drinking fountains, electrical fixtures, accessories, etc.

2.08 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS - CAST IN-PLACE CONCRETE:

- A. All equipment, labor, trades and materials shall be supplied by building installer.
 1. Includes all materials and labor for foundations/footings, interior slabs, exterior/entry slabs, and sidewalks.
- B. Engineered fill shall be ¾" minus crushed aggregate around footings, foundations, and slabs as required.
- C. Slab vapor barrier shall be 6-mil continuous plastic under the concrete slab.
- D. The foundation shall be installed as designed with all cast in-place concrete poured to dimensions specified in final plans.
 1. Footings will be built to 24" depth.
 2. Minimum compressive strength of 3000 psi at 28 days, 4+/-1" slump, with max ¾" aggregate, cured in accordance with ACI 308.
 3. Slabs shall have a fine broom finish with joints required in flat work as shown on plans.

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- 4. Steel rebar shall be installed as specified in final plans.
- E. Concrete slab sealer shall be a water-based transparent curing, sealing and dust proofing compound with two (2) coats to be applied per manufacturer's instructions.
- F. Refer to drawings for sidewalks and entry slabs.
 - 1. Minimum concrete compressive strength of 2500 psi at 28 days.
 - 2. Remesh or rebar reinforcement shall be used in sidewalks.
 - 3. All sidewalks shall be finished with a fine broom with control joints installed per engineer's specification.

2.09 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS -
STRUCTURE:

- A. Masonry (concrete) grout shall be supplied by building installer.
 - 1. Grout shall have a minimum compressive strength of 2500 psi at 28 days, 9+/-1" slump, with max 1/2" aggregate.
 - 2. Fine or coarse grout may be used in accordance with 2009 UBC.
 - 3. All CMU must be fully grouted and may not be wetted.
- B. Rebar in walls shall be supplied by building installer.
 - 1. All walls have # 4 and # 5 rebar, see plans for spacing.
 - 2. All rebar used in building must meet ASTM A615 manufacturing standards and is to be placed per plans.
- C. Sealant for cedar board and batten siding is by building installer.
- D. Sealant for all exposed wood shall be supplied by building installer.
- E. Gutters and downspouts are by building installer.
- F. Gypsum board wall and ceiling finish is by building installer.

2.10 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS -
PLUMBING:

- A. Plumbing rough-in, installation and trim shall be supplied by building installer.
 - 1. All underground water service and sewer drain(s) from building to be as specified in final site plan.
 - 2. All floor drains shall be as shown on final building plans.

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3. Building water shutoff valve, drain, and all rough piping shall be as shown on final building plans. Final location to be set onsite.
4. Minimum water pressure at toilet and urinal flush valves shall be 40 psi. with minimum pipe sizing as per 2009 Uniform Plumbing Code Section 610.
5. Install the supplied fixtures and all other plumbing supplies as specified in final plans.

B. Floor drains shall be supplied by building installer.

C. Water line drain valve shall be supplied by building installer.

2.11 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS - ELECTRICAL:

- A. Electrical rough-in, installation and trim shall be supplied by building installer.
1. All underground and/or overhead service to building shall be as specified in the final site plan.
 2. Electric meter base and all rough wiring, switches, plugs and circuit breakers shall be as shown on final plans. The building supplier does not supply the meter base and meter.
 3. Building installer is responsible for all necessary wire, connectors, grounding, conduit etc. to install the components and meet national and local code. The installation of these components shall comply with all state and/or local codes.
- B. Electrical outlets and switches are by building installer.

2.12 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS - OTHER MATERIALS & EQUIPMENT:

- A. Unless otherwise specified, the following products and materials are NOT supplied by Romtec.
1. All items not listed in Romtec Products.
 2. Any item listed as supplied by “installer”, “contractor”, “owner”, or “others”.
- B. Unless specified in the plans or submittals, Romtec does not supply the following:
1. Building installation
 2. Asphalt paving
 3. Masonry pavers
 4. Sidewalks

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5. Landscaping
6. Site grading
7. Cast-in-place concrete foundations, footings, interior slabs and exterior/entry slabs
8. Concrete slab sealer
9. Mortar
10. Concrete grout
11. Rebar
12. Latex epoxy paint
13. Caulk for siding
14. Plumbing & electrical rough in, installation and trim
15. Branch circuit breakers
16. Switches & outlets
17. Typical fasteners; for example, roofing nails, staples, etc.
18. Fasteners not included in product packaging
19. Gutters and downspouts
20. Fire alarm and fire suppression equipment
21. Lighting equipment not attached to the building
22. Clear coat finish for all decking, glulam beams, posts, and extensions
23. All other items indicated on final plans or required by building codes which are not specifically stated as supplied by Romtec.

2.13 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS -
DELIVERY, STORAGE, AND HANDLING:

- A. The building installer will be responsible for all equipment and labor required for off-loading of the building onsite.
- B. The building installer will assume responsibility for adequate protection of materials from weather, damage, and pilferage or all warranties, expressed or implied may be voided.

PART 3 – EXECUTION

3.01 SPECIAL INSPECTION:

- A. If required, special inspection shall be owner supplied.
- B. If special inspection is required per the building department or other regulatory agencies, then the building supplier can assist but NOT provide this service.

3.02 INSTALLATION:

- A. All components to be installed according to the plan sets and/or manufacturer's instructions.

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3.03 OPERATION & MAINTENANCE MANUALS:

- A. Upon installation, do not throw away the Operations & Maintenance manuals that are provided by some manufacturers in their packaging. Requests for additional copies from the building supplier will result in subsequent charges.

END OF SECTION

SECTION 13 34 23
PRE-ENGINEERED TRASH ENCLOSURE

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. The work shall include furnishing the sealed architectural, structural, mechanical, and electrical plan sets as well as the structural, mechanical, and electrical building components as a complete, pre-designed packaged building as shown on drawings and as specified herein.

1.02 SCOPE:

- A. Packaged building and all associated design and engineering, with all listed components supplied by Romtec, Inc., hereafter designated as the building supplier. The building supplier shall be a single source design, engineering, and manufacturer who shall supply the packaged building and meet all the following scope requirements.

- B. The contractor is responsible for building installation, hereafter designated as the building installer. Building installer work will generally include: site preparation and grading, excavations for structures, backfill and/or structural backfill, foundation and pad construction, and building construction.

Note: Romtec Inc. does not serve as the building installer. Romtec Inc. is only the packaged building supplier.

- C. The packaged building should be the latest standard product of a building supplier regularly engaged and having at least ten (10) years of experience in packaged building engineering, design, supply, and construction.
- D. The building supplier must meet or exceed the product specification which was prepared using the Romtec Inc. building as a guide and example.
- E. Alternate building suppliers shall demonstrate that they have designed, engineered, produced, delivered, and constructed at minimum ten (10) other functioning site built buildings of similar type. Project completion date and a reference contact from the owner of each project must be provided.
- F. Alternate building suppliers must also disclose all instances of any prior municipal or landscape architect's rejection of the same or similar product as an "or equal" to the specified basis of design building package.
- G. Contractors wanting to propose an "or equal" building supplier other than Romtec Inc. are required to submit a complete submittal package with full

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sealed plan sets, calculations, and all pre-engineered structural items, ten (10) calendar days prior to the bid opening date. Any products proposed as “or equal” that are not as specified must be specifically listed and accompanied by the manufacturer’s data sheets for review. This will be approved or denied prior to the bid opening. Incomplete submittals will be rejected and returned to the bidder.

- H. The building and its concrete footings, foundation, and slab are to be engineered by the building supplier to meet site specific conditions including wind and snow loading, local frost depth, and ground conditions.
- I. Footings are to be dug by the building installer and poured on site to meet local code for permanent structures. A prefabricated, modular mat placed on compacted base is not an accepted equal to a site specific, site poured, engineered foundation.
- J. Typical fasteners such as nails, staples, and screws shall be supplied by building installer. Atypical fasteners shall be supplied by building supplier.
- K. Building is to be designed and constructed on site to meet local codes and approvals for permanent structures. Any building that is temporary, permanently relocatable, prefabricated modular, an offsite constructed product, or pre-cast is not an accepted equal to permanent, on site, conventional construction.
- L. No outside entity approval will override the local building authority’s codes and inspections. Seals meant for modular homes and production plant certifications will not be allowed in lieu of sealed plans from a licensed engineer and conventional inspection during construction.
- M. The Romtec building package has been quoted with the specific product colors noted below. Changes to these color selections may result in a price increase.
- N. Building sidings, treatments, and roofing are to be as specified. Precast buildings with painted textures are not to be considered architecturally equivalent.
- O. Within one (1) week of contract award, the building supplier shall submit the packaged building preliminary Scope of Supply and Design Submittal (SSDS), including the building plan view and elevation drawings.
- P. The SSDS is reviewed by the necessary parties and returned to the building supplier with any revisions to the contractual language, product data sheets, and/or building plan view and elevation drawings. Once the design is approved, the building supplier will provide a sealed plan set stamped by an

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engineer licensed in the state that the building is located for building department review.

- Q. One full round of sealed plan revisions are to be provided by the building supplier in the design and engineering services before additional fees apply.
- R. The building supplier shall submit complete, code compliant building plans including plans, elevations, sections, and details, under seal of a National Kitchen and Bathroom Association (NKBA) certified technical designer.
- S. The building supplier shall submit complete structural calculations meeting code loads, design loads, and seismic design under seal of a professional Engineer with current license in the state of California.
- T. Once submittal approval is received, three (3) wet stamped sets of plans and structural calculations shall be issued. Any additional plan sets and structural calculations can be obtained for a fee.
- U. The building supplier does not provide a final site plan.
- V. The reviewing authority reserves the right to review or reject all submittals at their sole discretion.
- W. All work and materials shall comply with the latest industry building codes and regulations for the state of California.
- X. Americans with Disabilities Act Accessibility Guidelines (ADAAG) will be followed in design, manufacture, and construction.
- Y. The specific supplier is indicated for each item. Building supplier, building installer, and owner supplied components are listed as such. Products not listed as building supplier or building installer supplied, are to be owner supplied.

1.03 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. The building supplier work shall include the design of the architectural, mechanical, structural, and electrical components that will be required for this building.
- C. The building will be designed as a complete, packaged building to be delivered to the job site to be constructed on site by the contractor.
- D. The building supplier will provide complete submittal documentation in the pre-engineered building suppliers standard submittal format for review.

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- E. The following sections shall be included in the building supplier's Scope of Supply and Design Submittal. Incomplete submittals will be rejected and returned to the bidder.
1. INTRODUCTION
 2. BUILDING SUPPLIER PRODUCTS & SERVICES
 3. PRODUCTS & SERVICES NOT SUPPLIED BY BUILDING SUPPLIER
 4. WARRANTY & LIMITATIONS
 5. PROJECT DESIGN
 6. PRODUCT DATA SHEETS
- F. The building supplier will provide the building plan view and elevation with the Scope of Supply and Design Submittal (SSDIS) electronically for review and approval.
1. The building supplier will revise the SSDS per the review comments.
 2. Once the design is approved, the building supplier will provide a sealed plan set stamped by an Engineer licensed in California for building department review.
 3. The building supplier will provide (2) sealed plan sets.
Note: Pricing allows for one revision in response to comments. Should additional revisions be requested, Romtec will provide a change order for the additional design work.
 4. The plan set standard size is 11" x 17".
Note: If a larger plan set size is required it will result in a price increase.
- G. The building supplier to supply O&M manuals if requested.

1.04 DELIVERY, STORAGE, AND HANDLING:

- A. The building supplier freight shall be based on delivering the product on a 48' to 53' flatbed or van truck and trailers, or as close as they can legally get to the site. Overall dimensions of the truck and trailers shall be the following: 70' overall length, 102" wide and 168" high.
- B. The building package to arrive on organized pallets that are shrink wrapped and separated into stages for ease of installation. Bill of material stating stages of components to be included.
1. Stage 1 pallets to include components such as block, frames, vents, beams, connectors, trusses, etc.
 2. Stage 2 pallets to include filler wall material, windows, skylights, roofing, etc.
 3. Stage 3 pallets to include siding material, tile, doors etc.

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- 4. Stage 4 pallets to include toilets, sinks, drinking fountains, electrical fixtures, accessories, etc.

1.05 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS -
DELIVERY, STORAGE, AND HANDLING:

- A. The building installer will be responsible for all equipment and labor required for off-loading of the building onsite.
- B. The building installer will assume responsibility for adequate protection of materials from weather, damage, and pilferage or all warranties, expressed or implied may be voided.

1.06 WARRANTY:

- A. The building and all its associated components will be warranted against defects in materials and workmanship for a period of not less than one (1) year from date of final acceptance. Acceptance is defined as the date of the delivery of the building and all its associated components or the date that the building and all its associated components are ready to deliver whichever comes first.

1.07 MAINTENANCE:

- A. The building supplier does not supply maintenance for the packaged building.

1.08 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2: PRODUCTS

2.01 MANUFACTURERS:

- A. Romtec, Inc.,

18240 North Bank Rd. Roseburg, OR. 97470

Tel: 541-496-3541; Fax: 541-496-0803; Email: cdooley@romtec.com Web:
www.Romtec.com

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- B. Requests for substitutions will be considered in accordance with provisions of Section 1.

2.02 BUILDING DESCRIPTION:

- A. Refer to plans for quantities, dimensions, locations, and installation methods for the materials and items described in this section. The building supplier reserves the right to make substitutions of equivalent materials and items without notice.
- B. Building dimensions shall match what is indicated on drawings.

2.03 WALLS:

- A. The following building to meet Buy America requirements.
- B. Concrete Masonry Units (CMU) shall be supplied by building supplier.
 - 1. Walls shall be constructed of 8"W x 16"L x 8"H smooth-face mortar joint concrete masonry units (concrete blocks) with sealant.
 - 2. Blocks shall be manufactured to ASTM C90 designation for load bearing concrete masonry units.
Note: The Building installer may be required to notch CMU block for bond beams, cut blocks to make the required shapes and/or grind block for fixture mounting.
 - 3. Block color to be Gray.
- C. Rain Guard anti-graffiti coating supplied by building supplier.
- D. Exterior finish to be cedar board and batten siding with cobblefield stone veneer accent supplied by building supplier.
- E. Steel framed gates with cedar inlay shall be supplied by building supplier.
 - 1. Double gate on the front and single gate on the back.
 - 2. Steel is primed and painted black.

2.04 ROOFING:

- A. The following roof components shall be supplied by building supplier.
 - 1. Steel truss and post roof system.
 - 2. Steel components are primed and painted black.
 - 3. Tongue & groove decking shall be 2x6 V-edge deck boards, select deck Douglas fir.

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- B. Roofing shall be Fabral, 26-gauge, Horizon 16, standing seam panels, with 16 in. coverage width.
 - 1. Roofing package shall include inside and outside foam closures, matching trim (eaves, gables and ridge) and fasteners, sheet metal flashing (all sides), and 30# felt (under metal).
 - 2. Roofing color to be selected by the owner from the manufacturers standard color chart.

2.05 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS - CAST IN-PLACE CONCRETE

- A. All equipment, labor, trades and materials shall be supplied by building installer.
 - 1. Includes all materials and labor for foundations/footings, interior slabs, exterior/entry slabs, and sidewalks.
- B. Engineered fill shall be $\frac{3}{4}$ " minus crushed aggregate around footings, foundations, and slabs as required.
- C. Slab vapor barrier shall be 6-mil continuous plastic under the concrete slab.
- D. The foundation shall be installed as designed with all cast in-place concrete poured to dimensions specified in final plans.
 - 1. Footings will be built to 24" depth.
 - 2. Minimum compressive strength of 3000 psi at 28 days, 4+/-1" slump, with max $\frac{3}{4}$ " aggregate, cured in accordance with ACI 308.
 - 3. Slabs shall have a fine broom finish with joints required in flat work as shown on plans.
 - 4. Steel rebar shall be installed as specified in final plans.
- E. Concrete slab sealer shall be a water-based transparent curing, sealing and dust proofing compound with two (2) coats to be applied per manufacturer's instructions.
- F. Refer to drawings for sidewalks and entry slabs.
 - 1. Minimum concrete compressive strength of 2500 psi at 28 days.
 - 2. Remesh or rebar reinforcement shall be used in sidewalks.
 - 3. All sidewalks shall be finished with a fine broom with control joints installed per engineer's specification.

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2.06 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS -
STRUCTURE:

- A. Masonry (concrete) grout shall be supplied by building installer.
 - 1. Grout shall have a minimum compressive strength of 2500 psi at 28 days, 9+/-1" slump, with max ½" aggregate.
 - 2. Fine or coarse grout may be used in accordance with 2009 UBC.
 - 3. All CMU must be fully grouted and may not be wetted.
- B. Rebar in walls shall be supplied by building installer.
 - 1. All walls have # 4 and # 5 rebar, see plans for spacing.
 - 2. All rebar used in building must meet ASTM A615 manufacturing standards and is to be placed per plans.
- C. Interior floors to be sealed concrete finish supplied by building installer.
- D. Sealant for all exposed wood shall be supplied by building installer.
- E. Floor drain shall be supplied by building installer.

2.07 BUILDING INSTALLER AND/OR OWNER SUPPLIED PRODUCTS - OTHER
MATERIALS & EQUIPMENT:

- A. Unless otherwise specified, the following products and materials are NOT supplied by Romtec.
 - 1. All items not listed in Romtec Products.
 - 2. Any item listed as supplied by "installer", "contractor", "owner", or "others".
- B. Unless specified in the plans or submittals, Romtec does not supply the following:
 - 1. Building installation
 - 2. Asphalt paving
 - 3. Masonry pavers
 - 4. Sidewalks
 - 5. Landscaping
 - 6. Site grading
 - 7. Cast-in-place concrete foundations, footings, interior slabs and exterior/entry slabs
 - 8. Concrete slab sealer
 - 9. Mortar
 - 10. Concrete grout
 - 11. Rebar

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12. Latex epoxy paint
13. Caulk for siding
14. Typical fasteners; for example: roofing nails, staples, etc.
15. Fasteners not included in product packaging
16. Irrigation Equipment
17. Gutters and downspouts
18. Fire alarm and fire suppression equipment
19. Lighting equipment not attached to the building
20. Clear coat finish for all decking, glulam beams, posts, and extensions
21. All other items indicated on final plans or required by building codes which are not specifically stated as supplied by Romtec.

PART 3 – EXECUTION

3.01 SPECIAL INSPECTION:

- A. If required, special inspection shall be owner supplied.
- B. If special inspection is required per the building department or other regulatory agencies, then the building supplier can assist but NOT provide this service.

3.02 INSTALLATION:

- A. All components to be installed according to the plan sets and/or manufacturer's instructions.

3.03 OPERATION & MAINTENANCE MANUALS:

- A. Upon installation, do not throw away the Operations & Maintenance manuals that are provided by some manufacturers in their packaging. Requests for additional copies from the building supplier will result in subsequent charges.

END OF SECTION

SECTION 21 13 13
WET-PIPE FIRE SPRINKLER SYSTEM

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

- A. Work includes, but is not necessarily limited to, the following work areas:
1. Design and installation of complete wet-pipe automatic fire sprinkler system including all interior areas, exterior soffits, combustibile concealed spaces, and provisions for future tenant improvements in tenant lease areas as indicated on drawings.
 2. Compilation of record drawings by installing contractor, including all field changes.
 3. Connection of interior fire sprinkler system to site fire service lateral, at point of connection shown on architectural and civil site plans.
 4. Test valves, drain lines, and all other inspection components.
 5. All coring, drilling, notching and chasing required for piping installation, as approved by Architect and Structural Engineer.
 6. Local audible alarm and monitoring panel and connection points for central station monitoring.
 7. Fees, permits, inspections and tests.
 8. Meetings and correspondence with project team members and local authorities having jurisdiction, to confirm specific requirements for this project, including:
 - a. Location and methods of discharging water from test and drain connections.
 - b. Zoning and signaling requirements for alarm, detection and monitoring systems.

1.02 RELATED WORK:

- | | |
|-------------------------|------------------|
| A. General Requirements | Division 01 |
| B. Painting | Section 09 91 00 |

1.03 REFERENCES:

- A. In addition to complying with all pertinent standards, codes and regulations, comply with all requirements of:
1. San Diego County General Services Department policies and regulations
 2. San Diego County Fire Authority policies and regulations
 3. NFPA 13, 24, 25 and 72 (adopted editions)

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4. Underwriters Laboratories (UL) and FM Global (FM) listed products.
5. ICC Evaluation Service product listings.

1.04 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 - Submittal Procedures
- B. Shop Drawings/Calculations
 1. Within 30 days after award of Contract, submit complete shop drawings to the Architect for review. A complete submittal shall include the following:
 - a. Principal dimensions, including tie-in dimensions to underground lateral at service entry location, building system riser and details of construction.
 - b. Sizes, types and locations of sprinklers, piping, valves, test connections, fittings, grooved couplings, braces and hangers.
 - c. Location of all switches, bells and electrical connections for alarm system, as described in this specification.
 - d. Location of all beams, soffits, skylights and other structural and/or architectural features which may affect or impact the design or installation of fire protection system. Include reflected ceiling plans, where applicable.
 - e. Details of structural connections for all hangers, seismic bracing and piping restraints. As required, submit proposed connections to project Structural Engineer for review.
 - f. Hydraulic calculations, formatted to meet the data requirements of NFPA 13 Chapter 23, and acceptable to all authorities having jurisdiction. Computer programs, which automatically locate the hydraulically most remote area of gridded systems, shall only be accepted if calculations include calculation worksheets or peaking summary sheets for at least two shifted design areas.
 - g. Materials list describing all major system components, including but not limited to, backflow prevention devices, valves, piping, fittings, grooved couplings, hangers, bracing, sprinkler heads and appurtenances.
- C. Plans shall be submitted to San Diego County Fire Authority for review and approval. Furnish at least 3 sets of all documents bearing approval stamp of serving fire agency on drawings, calculations, data sheets, and other documentation, requiring such approval. Submittals described in this section may be scanned copies of the wet-stamped originals.
- D. Maintenance Manual: Submit maintenance manual fully describing maintenance schedules, replacement parts, and other operation requirements.

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- E. Guarantee: Contractor shall guarantee fixed fire protection system, for a period of two years after date of final inspection, from leaks and other failures from materials and workmanship. Guarantee shall include repair of damage to Owner and/or tenants.

1.05 QUALITY ASSURANCE:

- A. Qualifications of Fabricator and Installers
 - 1. For actual fabrication and installation of sprinkler systems, use only personnel who are thoroughly trained and experienced with the products involved, and in the recommended methods of their installation. There shall be at least one experienced journeyman or equivalent supervising the installation at all times.
 - 2. In the acceptance or rejection of the sprinkler system, no allowance will be made for lack of supervision on the part of installing technicians.
 - 3. Installing contractor shall have a California C-16 license.
- B. Qualifications of Designer or Engineer of Record: Piping design and all hydraulic calculations shall be prepared by the installing contractor or an engineer licensed in the state of California and experienced in designs for similar systems.

1.06 COORDINATION:

- A. Coordinate work with that specified in other sections before start of installation. Any work found to be in conflict with other trades as a result of neglected coordination shall be removed and reinstalled in new locations designated by the Architect at no additional expense to the Owner.
- B. Contractor shall contact the Architect and obtain necessary information to design fire sprinkler system to fit into allotted spaces without interfering with work by other trades.
- C. Coordinate with Plumbing section for size and location of drain receptors, for draining and testing fire sprinkler risers and systems. All drains shall discharge into receptors furnished by plumbing contractor, and routed to sanitary sewer or approved location. Contractor shall be responsible for compliance with any drainage requirements and/or pollution prevention standards.

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1.07 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – DESIGN AND MATERIALS

2.01 DESIGN CRITERIA:

- A. Coverage and Scope
 - 1. Design all storage, mechanical and utility areas for Ordinary Hazard, Group 2. System shall discharge a minimum density of .20 gpm/sq. ft. over the most remote 1500 sq. ft. Standard spray sprinklers shall be spaced at 130 sq. ft. maximum area per sprinkler.
 - 2. All other areas, including unoccupied concealed and void spaces may be designed for Light Hazard. System shall be designed to discharge the appropriate density for adjacent occupied areas. Sprinklers shall be spaced as appropriate for type of construction.
- B. System shall be designed using point of connection as shown on drawings, and as described in this specification.
- C. Flow Tests
 - 1. Water supply data shall be as furnished by fire pump manufacturer. Allow for a 5% degradation in pump performance (as allowed by NFPA 20 and NFPA 25) over the life of the pump. Data used for system design must conform to actual on-site conditions at time of final inspection. This information is shall be verified at the time of final acceptance testing.

2.02 MATERIALS AND PRODUCTS:

- A. All material installed shall be approved and/or listed for fire protection use by the referenced authorities, codes and standards. All material shall be new and without field modifications.

2.03 SPRINKLERS:

- A. General: All sprinklers shall be of similar make and appearance. All heads shall have the same bulb or link and finish except where otherwise required by exposure to heat sources, freezing temperatures, corrosive environment, etc.

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B. Interior Finished Ceilings and Exterior Soffits

1. Furnish recessed standard spray pendent, bulb or fusible link type, with white, factory-painted finish.
2. Escutcheons shall be matching white-painted finish and be listed for installation with selected sprinklers.
3. Corrosion-resistant finish shall be installed at exterior areas, with matching escutcheon. Color and finish of all corrosion-resistant sprinklers shall be UL/FM approved and be coordinated with Architect.

C. Concealed Areas, Unfinished Ceilings, and Service Areas

1. Provide standard spray upright or pendent, with rough brass finish.
2. Where required, escutcheons shall be two-piece, style #401 with chrome finish at mechanical, electrical and storage room ceilings.

D. Sidewall Sprinklers

1. Sidewall sprinklers, equivalent to 2.3 (B) may be used in exterior and interior applications, subject to Architect's approval.
2. Provide horizontal or vertical standard spray sidewall head with white, factory-painted finish.
3. Escutcheons shall be matching white-painted finish and be listed for installation with selected sprinklers where such listing applies.

E. Temperature Ratings and Response Type

1. Sprinklers below finished ceilings, and in all other occupied areas shall have a temperature rating of Ordinary (155-165 ° F), except as noted below.
2. Sprinklers in unventilated concealed spaces, and at shell piping systems above and below mezzanines, shall have a temperature rating of Intermediate (200-212 ° F), unless otherwise required by code.
3. All sprinklers in Light Hazard areas shall be listed, quick-response type.

2.04 HANGERS AND SUPPORTS:

- A. Furnish hangers and restraints listed by UL/FM and as required by NFPA 13 for fire sprinkler systems. Shop-fabricated supports shall be designed to meet requirements of NFPA 13, and must be certified by a registered professional engineer.
- B. Provide earthquake bracing in accordance with UL/FM, NFPA 13 and ASCE 7. Locations of all bracing shall be clearly shown on shop drawings. All bracing shall be assembled, calculated and installed per NFPA 13, Section

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9.3.5. All calculations shall be shown on shop drawings or included in the materials submittal package.

- C. Size all anchors and fasteners per NFPA 13. All lag screws, bolts and drive screws shall be installed as required by codes and accepted good practices. Pilot holes shall be drilled in wood framing members prior to driving principal anchor. Under no circumstances shall threaded fasteners or bolts be hammered or pounded into framing.
- D. All fasteners and/or anchors proposed for use in concrete construction shall be specifically listed and approved for use on fire sprinkler systems in seismic zones. Powder-driven studs shall not be used unless all system components including installation tool and pins are listed.

2.05 INTERIOR SPRINKLER PIPE AND FITTINGS:

- A. General: All pipe and fittings shall be new, acceptable to authorities having jurisdiction, per all applicable standards and codes, and free from damage and distortion.
- B. Product Characteristics
 - 1. Black steel, Schedule 40, ASTM A-53/135/795, for all piping with threaded joints and fittings.
 - 2. Black steel, Schedule 10, ASTM A-53/135/795, for all piping with non-threaded joints and fittings.
 - 3. Threaded fittings shall be of cast or malleable iron, class 125 or 150, conforming to ANSI B16.3 and ANSI B16.4.
 - 4. Flanged fittings shall be provided where required. Flanges shall be of cast iron, class 125, conforming to ANSI B16.1.
 - 5. Welded fittings shall be of wrought steel, conforming to ANSI B16.9.
 - 6. One-piece reducing fittings shall be used wherever a change is made in pipe size. Bushings shall not be used, except where fittings of the required size are not available.
 - 7. Grooved thinwall steel pipe connections shall be made using a UL/FM approved ductile iron coupling, with rubber gasket. Installation shall be per manufacturer's instructions.
 - 8. All piping shall be joined with welded, threaded or grooved fittings. Fittings for hole-cut connections will not be accepted for new construction.

2.06 ACCESSORY CABINET:

- A. Provide metal sprinkler cabinet for a reserve supply of sprinkler heads, as required by NFPA 13. Include one suitable head wrench for each type of sprinkler installed. Stock shall include all types and temperature ratings installed. Locate as directed by Architect.

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2.07 SIGNS:

- A. Provide metal signs, permanently marked to show function, for all valves, controls and related assemblies. Locate as required by codes and authorities having jurisdiction. Where signs are necessary to identify valves or assemblies in hidden or void spaces, locate as directed by Architect.

2.08 PROTECTION OF SPRINKLERS:

- A. Provide UL/FM listed guards for sprinkler heads located in areas susceptible to mechanical damage.

2.09 ESCUTCHEON PLATES:

- A. Provide chrome plated escutcheons where piping penetrations are made through finished walls and ceilings. Plates shall be painted to resist corrosion when exterior installation is required.

2.10 LOCAL ALARM COMPONENTS:

A. Alarm Bell

- 1. Provide 10" diameter, UL/FM approved bell with identification sign, rated 120VAC, with standard mounting hardware.
- 2. Locate where required by authorities having jurisdiction, and as acceptable to Architect.

B. Water Flow Switch

- 1. Provide UL/FM approved, 12 or 24 VDC or 120VAC, with two sets of Form C, single pole, double throw contacts, and adjustable retard feature.
- 2. Retard shall be set by Contractor so as to prevent false alarms, and still allow audible alarm within 30 seconds.

2.11 CENTRAL STATION SUPERVISION:

- A. Furnish valve supervision, as required by authorities having jurisdiction, at all valves controlling fire protection water supplies, and any required underground conduit thereto.
- B. Provide UL/FM approved tamper switch, Model PIVSU-A1, or OSYSU-A1, or UL/FM listed equivalent, 120VAC with one set of Form C, single pole, double-throw contacts.
- C. Flow and tamper connections shall be furnished and zoned as required by serving fire department.

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2.12 FIRE DEPARTMENT CONNECTION:

- A. Provide single clapper, 4" x 2 1/2" two-way, Siamese fire department connection. Finish and model shall be as required by serving fire department. Provide check valve per Section 2.14B.

2.13 VALVE COMPONENTS:

A. Control Valve

1. Provide ductile iron body, bronze disc, non-rising stem gate valve with approved indicator post.
2. Post shall be listed with valve where required and be field painted as required by serving fire department.
3. Ductile iron body, double disc, bronze-mounted OS&Y or butterfly gate valve, located at the fire pump discharge main.

B. Check Valves

1. Check valves shall be iron body, bronze mounted, horizontal swing check. As acceptable to authorities having jurisdiction, iron body, bronze, disk wafer check may be used.
2. Check valve shall be U.L/F.M. approved for fire protection use, and recommended by the manufacturer for direct bury where such installation is to be required.
3. Iron body, bronze disk threaded or grooved swing check may be installed at Fire Department Connection, and located as acceptable to serving fire department.

C. Interior Drain/Test Valves

1. Furnish listed combination test and drain valve with integral pressure relief bypass, rated minimum 175psi working pressure.
2. For auxiliary drainage, furnish brass, rubber disc, angle or globe pattern, with screwed ends, rated 200psi WOG.

2.14 VALVE CHART:

- A. Provide chart in enclosed frame, indicating all valve locations and system functions.

2.15 UNDERGROUND PIPE AND FITTINGS:

- A. General: All pipe and fittings shall be new, acceptable to authorities having jurisdiction, comply with all applicable standards and codes, and free from damage and distortion.

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B. Product Characteristics

1. Horizontal piping shall be Polyvinyl chloride Pipe (PVC), conforming to AWWA C900 and shall be plain end or gasket bell end, Pressure Class 150 (DR 18) with cast- iron-pipe-equivalent OD.
2. Fittings shall be gray-iron or ductile-iron conforming to AWWA C110, and shall have cement-mortar lining conforming to AWWA C104, standard thickness. Fittings with push-on joint ends shall conform to the same requirements as fittings with mechanical-joint ends, except that bell design shall be modified, as approved, for push-on joint suitable for use with PVC plastic pipe specified in this paragraph.
3. Piping shall be installed so that no mechanical joints are located below structural footing or slab on grade. Service entry shall be made with a listed one-piece stainless steel riser sweep, UL/FM approved for fire sprinkler systems.
4. All hardware installed below-grade, including studs, bolts, nuts, washers, thrust-restraint rods, etc. shall be stainless steel conforming to UNS 31600 (formerly AISI Type 316). Hex- head bolts shall conform to ASTM F593, Alloy Group 2, Condition CW1/CW2 (depending on size). Hex nuts shall conform to ASTM F594, Alloy Group 2, Condition CW1/CW2 (depending on size). T-bolts shall be stamped to show conformance with UNS 31600.
5. All metallic fittings and hardware shall be coated with non-oxide grease or other approved corrosion inhibitor, and encased in polyurethane wrap or sleeves

PART 3 – EXECUTION

3.01 JOB SITE CONDITIONS:

A. Inspection

Prior to all work of this section carefully inspect the installed work of other sections, and verify that all such work is complete to the point where this portion of the work may properly commence in accordance with all submittals, designs, and applicable codes.

B. Discrepancies

In the event of a discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies and/or omissions have been fully reviewed and clarified.

3.02 FABRICATION:

A. General

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1. All pipe, fittings, and materials shall be prepared by qualified personnel, trained and experienced with the products involved, and the recommended methods of preparation.
2. All pipe cuts, threads, and grooves shall be made according to applicable codes, standards and accepted good practices.
3. Pipe shall be free of damage, flaws and burrs. Threads and grooves shall not be excessively shallow or deep.
4. Fittings shall be made onto the pipe no tighter than necessary. Contractor shall replace cracked or broken fittings, without exception.
5. Excess dope and oils shall be removed before shipment to job site.

B. Welding

1. Welding methods shall comply with NFPA 13 and AWS B2.1. Contractor shall be responsible for all welded joints and any qualifying procedures for welders and related personnel.
2. Holes in pipe for outlets shall be cut to full inside diameter of fitting, prior to welding in place. Holes shall be free of slag and welding residue, and of smooth continuous bore. Fittings shall not penetrate internal diameter of run piping. Holes shall be cut by hole-saw, plasma device or rotary bit. Torch-cutting of holes is strictly prohibited.
3. All welded pipe shall be subject to inspection by serving Fire Department before it is installed. Provide documentation of acceptance, as required, at time of project closeout.

3.03 INSTALLATION:

- A. All installations shall be per referenced standards. Follow manufacturer's directions and recommendations in all cases as required for all approvals and warranty enforcement.
- B. All cutting of structure shall be subject to approval by the Architect. Beams, decks and other structural components shall not be cut or altered in any way unless previously approved.
- C. Provide flexible couplings where required to provide expansion capability, and for earthquake protection per NFPA 13. Provide sway bracing as required by coupling locations.
- D. Entire sprinkler system shall be installed in such a manner so that it can be drained in accordance with NFPA 13. Drains shall be located at suitable points as approved by Architect. No primary or auxiliary drain shall be located in any public area or electrical room. All drains shall discharge into dedicated receptors.

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- E. No work shall be covered or enclosed until inspected, tested, and approved by Architect and/or authority having jurisdiction. Should any work be concealed before inspection, the Contractor shall, at Contractor's expense, uncover such work and after it has been inspected, tested and approved, provide for all repairs as may be necessary to restore work to original and proper condition.
- F. Sprinklers at finished ceilings shall form a symmetrical pattern and shall be located at the exact centerline of 2' square ceiling tiles and "Second Look" tile modules. Where 2' x 4' ceilings occur, heads shall be centered in the 2' direction with escutcheons to be at least 6" clear of ceiling T-bars.
- G. Sprinkler layout shall accommodate lighting and HVAC register locations. Coordination with the work of these sections is the responsibility of Contractor.
- H. Provide 1" outlets for drops to future tenant ceilings in all lease areas not fully improved as a part of this contract. Where required, furnish temporary sprinkler protection using bushings or 1" sprig nipples with reducing fittings. Deflector distances of temporary sprinklers in lease areas shall be in accordance with NFPA 13. The use of baffles to install sprinklers at non-compliant deflector distances will not be accepted.
- I. Piping shall be installed as high and tight to structure as reasonably possible, with allowance for required clearances to install 1" plugs for future tenant sprinklers and satisfy all deflector distance and obstruction requirements of NFPA 13.
- J. Without exception, no piping shall be run under or through any skylight or skylight well. Any additional upright or pendent sprinklers, which may be required by skylight locations, shall be the responsibility of this contractor.
- K. All penetrations of wall and floor assemblies shall be suitably sleeved, patched and/or sealed in order to preserve fire rating, where applicable.
- L. Location of control valves, fire department connection, and inspector's test shall be as required by authorities having jurisdiction, and as approved by Architect.
- M. Local alarm bell shall be located so that it can be easily heard and seen by passersby and fire department personnel. Locate on exterior wall, 10'-0" above finished grade, on address side of building as approved by Architect.
- N. Provide wood or metal floor pans under and around pipe cutting/threading machines, in designated work areas, to protect floor surfaces from damage and discoloration.

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- O. Paint all fire sprinkler piping risers, drops and other components exposed to view in final construction as directed by Architect and per Section 09 90 00.
- P. Underground pipe and fittings shall be installed per NFPA 24, and applicable local codes and standards. Trenching, back-filling, depth of bury and size, shape and location of all thrust blocks shall be acceptable to all jurisdictional agencies.
- Q. Point of connection for underground fire services shall be at point of connection shown on civil drawings. Location, size, and pipe type shall be as shown on civil plans. Underground pipe and fittings shall be installed per NFPA 24, and applicable local codes and standards. Trenching, back-filling, depth of bury and size, shape and location of all thrust blocks shall be acceptable to all jurisdictional agencies.

3.04 FIELD QUALITY CONTROL:

A. Testing

- 1. Perform all tests as required by NFPA 13, and all authorities having jurisdiction. Maintain an accurate record of all tests and inspections on the job site, including date of test and inspecting agency.
- 2. Before connection of interior system to underground main, underground piping shall be hydrostatically tested, flushed and accepted by authorities having jurisdiction. Provide documentation of acceptance by jurisdictional authority. All required health and bacterial tests shall be the responsibility of Contractor.

3.05 COMPLETION:

A. Closeout

- 1. Upon completion and approval of system, and prior to occupancy, provide instruction to the Owner, or Owner's representative, in all details of system operation and maintenance. Prepare and submit maintenance and operation manual.
- 2. Provide three copies of final inspection and certification as prescribed by Owner's Insurance Underwriter, and other authorities having jurisdiction.
- 3. Furnish three copies of NFPA 13 Contractor's Material and Test Certificate for underground and overhead piping.
- 4. Provide three (3) hard copies of system "As-Built" drawings to the Owner or Owner's representative. Drawings shall show actual installation details including all piping and equipment locations, room or facilities modifications, etc. Furnish electronic copy of all documents on CD or DVD.
- 5. Submit three copies of guarantee.

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B. Clean Up

1. Equipment, appurtenances, fixtures and exposed piping shall be clean, and all excess dope and oil shall be removed. Sprinkler heads shall be cleaned without the use of any solvents.
2. Upon completion of work, remove all surplus material, debris, and equipment associated with or used in the execution of this work. Sweep work and storage areas, as required, to remove metal shavings and oily residue.

END OF SECTION

**SECTION 22 14 29.16
SUBMERSIBLE STORMWATER PUMPS**

PART 1 – GENERAL

1.01 SUMMARY

- A. Furnish all labor, materials, equipment and incidentals required to provide the Subdrain Pump Station submersible pumps as specified herein and on the project plans.
- B. Provide and test pumps, electric motors, motor frame, guiderail system, anchor bolts, and appurtenances as indicated and specified for the Subdrain Pump Station.
- C. The pumps shall be able to be removed from the top of the manhole (without the need for personnel to enter the manhole) with the use of a specially designed discharge elbow and guiderail system.

1.02 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with the General Provisions and as specified herein.
 - 1. Data regarding pump and motor characteristics and performance:
 - a. Provide guaranteed performance curves showing they meet specified requirements for head, capacity, and horsepower efficiency.
 - 1) For units of same size and type, provide curves for a single unit only.
- B. Dimensional drawings and data for accessory items including guiderail, guiderail brackets, discharge elbow and other system components.
- C. Operating and Maintenance Manuals.
 - a. Submit materials for inclusion in Operating and Maintenance Manuals. Include manufacturer's instructions for equipment installation, start-up, operation, preventative maintenance, servicing, and troubleshooting procedures. Include parts list for maintenance and servicing.
- D. Field inspection reports.
- E. Field testing reports.

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1.03 QUALITY ASSURANCE

- A. Unit Responsibility: All equipment shall be of new and of current manufacture. The pump, mechanical seals, motor units, guiderails, guiderail brackets, pump discharge elbow, anchor bolts, float switches, and control and monitoring unit shall be supplied by the same manufacturer or supplier in order to achieve standardization of operation, maintenance, spare parts, manufacturer's service and warranty. The pump supplier and the Contractor shall assume full responsibility for the completeness of the pumping system. The pump manufacturer shall be the source of information on all respective pumping equipment furnished per this section of the Specifications.
- B. Each set of pumps to be of the same type and the product of one manufacturer.
- C. Pumps to be manufacturer's standard cataloged product.

1.04 MANUFACTURER QUALIFICATIONS

- A. Manufacturer's Qualifications: The manufacturer shall be experienced in manufacturing solids handling pumping equipment similar to those indicated for this Project and that have a record of successful in-service performance. Manufacturer must have at least fifty (50) similar facilities in operation and have a history of providing this equipment for at least twenty (20) years. Upon request, submit evidence of previous experience.

1.05 WARRANTY

- A. The equipment shall be warranted for a period of one (1) year from substantial completion, to be free from defects in workmanship, design or material. If the equipment should fail during the warranty period due to a defective part(s), it shall be replaced, and the unit(s) restored to service at no expense to the County.
- B. This warranty shall not deprive the County of other rights the County may have under other provisions of the Contract Documents and is in addition to and runs concurrent with the warranties made under the requirements of Contract Documents.

1.06 MANUFACTURER'S SERVICE

- A. Coordinate the work schedule of the manufacturer's service personnel during construction, testing, start-up and acceptance.
- B. Provide services of a factory trained Service Engineer, specifically trained on the type of equipment specified. Submit qualifications of Service Engineer for approval. One person-day is an 8-hour day on-site. The minimum person-day requirements specified are exclusive of travel time and do not relieve

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Contractor of his obligation to provide enough service to place equipment in satisfactory operation and in accordance with the Manufacturer's instructions and warranty requirements. All person-days not used during the project shall be credited back to the County.

- C. Minimum Person-Day Requirements (assume separate visits required for each work phase):
 - 1. Installation, start-up, and testing of pumps: 1 person-days
- D. Time and materials used to correct defective equipment at no additional cost to the County and in addition to time periods specified above.

1.07 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Submersible pumps shall be Myers, WHR Series, or approved equal.

2.02 DESIGN CRITERIA

- A. Each pump shall have a minimum capacity of 150 GPM at a total head of 17 feet and motor size shall be 1 horsepower, 3 phase 60 Hz for operation at 208 volts. Shut-off head shall be at least 30 feet.

2.03 CONSTRUCTION

- A. Pump
 - 1. Pump shall be of the submersible type with recessed impeller to give complete unobstructed volute opening for passing of solids. Pump shall pass 2" diameter solids.
 - 2. Discharge of pump shall be provided with bolt on 3" NPT flange so that 3" pipe size may be used.
- B. Motor

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1. Pump motor shall be of the submersible type rated 1 horsepower as required. Motor shall operate at 1750 RPM and shall be for 208 volts three phase.
2. Stator winding shall be of the open type with Class A (105°C) insulation for operating in clean dielectric oil that lubricates bearings and seals and cools the winding. Stator shall be pressed into housing for the best alignment and heat transfer.
3. Common motor pump shaft shall be of 416 stainless steel and shall be heat shrunk into the die cast motor rotor. Rotor shaft shall be supported by a lower ball bearing to take thrust and radial loads and by an upper bronze sleeve bearing to take radial load only.
4. Three phase motor shall be protected by 3 leg overload element in control box. Overload shall be of the quick trip ambient compensated type and shall have a manual reset button.
5. Motor to be a completely assembled unit with end plate for mounting in volute case. Complete motor and pump impeller to be removable as a unit from the volute casing.

C. Coatings

1. All iron castings shall be pretreated with phosphate and chromic rinse and shall be painted with a high quality, lead free, alkyd enamel air dry paint. All fasteners to be 302 stainless steel.

D. Seals

1. Motor shall be protected by two mechanical seals mounted in tandem with a seal chamber between the seals. Seal chamber shall be oil filled to lubricate seal face and to transmit heat from shaft to outer shell. Seal face shall be carbon and ceramic and lapped to a flatness of one light band.
2. A leak detection sensor shall detect and send a signal water leaked in between the two mechanical seals.

E. Impeller

1. Shall be cast iron and of the recess type. Pump-out vane shall be used on back shroud. Impeller shall be dynamically balanced. Impeller to be threaded on shaft and held in position with locknut.
2. Impeller and motor shall have top lift-out of case so that the assembly can be removed without disturbing any piping.

F. Pump Case

1. The volute case shall be of cast iron and shall be provided with bolt-on flange so the 3" pipe size may be used.

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G. Cord

1. The cord shall be potted into a steel connector with polyurethane resin for leak proof seal. A cord nut and rubber grommet shall clamp the cord into the bushing. Cords shall withstand a pull of 100 pounds.

2.04 ACCESSORIES

A. Discharge Elbow

1. The pump shall be fitted with a 3" vertical pump base discharge elbow.
2. The discharge elbow shall be constructed of ductile iron with a fusion bonded epoxy coating.
3. Fasteners and other hardware shall be stainless steel.

B. Guiderails

1. Guiderails shall be 1-inch in diameter minimum, or as shown on the Drawings.
2. Guiderails, brackets, and components shall be constructed of Type 316 Stainless Steel.

2.05 CONTROLS

A. Control Strategy

1. The pumps shall alternate operation to equalize pump wear.
2. The pumps shall turn ON and OFF based on the levels shown on the Drawings using float switches.
3. Alarm Conditions:
 - a. High-High Water Level (HHWL) as shown on the Drawings
 - b. Low-Low Water Level (LLWL) as shown on the Drawings
 - c. Pump High Temperature/Pump Motor Overload
 - d. Pump Seal Leak
 - e. Pump Failure

B. Control Panel:

1. The pump control panel shall UL/cUL listed and shall consist of the following features.
 - a. NEMA 4X enclosure for outdoor use
 - b. Red alarm beacon provides 360° visual check of alarm condition
 - c. Alarm horn provides audio warning of alarm condition
 - d. Exterior alarm test/normal/silence switch allows horn and light to be tested and horn to be silenced in an alarm condition; alarm automatically resets once alarm condition is cleared
 - e. Horn silence relay

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- f. IEC motor contactor controls pump by switching electrical lines
 - g. Multi-tap transformer (208/240/480 VAC primary) provides 120V control/alarm voltage
 - h. Motor protective switch provides adjustable overload, branch circuit protection and pump disconnect
 - i. Hand/Off/Auto (HOA) switch for manual pump control
 - j. Green pump run indicator light
 - k. Alarm and control fuses/indicators
 - l. Float switch terminal block
 - m. Input power terminal block
 - n. Ground lugs
 - o. Elapsed time meter
 - p. Event (cycle) counter
2. The control panel shall be as manufactured by SJE Rhombus, or equal.

PART 3 – EXECUTION

3.01 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Packaging shall be as required to prevent damage during shipment and unloading.
- B. Handle all equipment and materials very carefully. Damaged equipment and materials will not be acceptable. Protect all bolt threads, etc. from damage and corrosion. Protect all factory applied coatings from damage during shipment, unloading, storage and installation.
- C. All material and equipment shall be covered or stored in a manner which will prevent entry of deleterious matter. Power cables shall be covered or stored in a manner which will protect them from dirt and abrasion.

3.02 INSTALLATION

- A. Install in a manner and to the tolerances recommended by the equipment manufacturer.
- B. Support piping independent of pump.
- C. Check and align unit components in accordance with the manufacturer's written recommendations.
- D. Make all electrical connections in conformance with requirements with the Electrical Plans and Specifications.

3.03 START-UP AND FIELD TESTS

- A. Verify that structures, pipes and equipment are compatible.
- B. Perform initial pump prime and ensure that pump operates as described above.
- C. Adjust as required to achieve optimum operation.
- D. Field test using job supplied flow meters and pressure gauges to demonstrate mechanical integrity and compliance with hydraulic performance criteria in this spec and with shop performance tests and vibration limitations. The tests shall demonstrate that the equipment operates in the manner intended. The Contractor is responsible for completing the work.
- E. Demonstrate that the completed installation meets specified requirements and that all controls and safety shutdowns are operational. Adjust as required to place equipment in proper operating condition.

3.04 MANUFACTURER'S FIELD SERVICES

- A. Retain factory trained pump and motor manufacturer's representatives with demonstrated ability and experience in the installation and operation of the pumps, and motors and accessories to perform the services listed below:
 - 1. Provide written recommendations for technical assistance to Contractor during installation of pumping units.
 - 2. Assist in initial start-up, adjustments and field testing.
 - 3. Instruct County's personnel in the operation and user.
 - 4. Provide written recommendations for the correction of any defective or faulty Work before and after acceptance by County. The Contractor is responsible for completing the work.
- B. The manufacturer shall test operate the pumps in the presence of the County and shall verify the equipment conforms to the specified requirements. The manufacturer representative shall re-visit the jobsite as often as necessary until all deficiencies related to the pump and motors specified in this specification are corrected and the installation and operation is satisfactory to the County.
- C. Perform all tests in the presence of the County and the pump manufacturer's representative.
- D. Submit report on pump performance from the pump manufacturer's representative.

END OF SECTION

**SECTION 26 00 00
ELECTRICAL**

PART 1 – GENERAL

1.01 SUMMARY

- A. This section includes materials, installation, and testing of the electrical system and lighting components for the Lakeside Equestrian Facility.

1.02 RELATED WORK

- A. One-Year Guarantee: General Provisions
- B. Permits and Licenses: General Provisions
- C. Submittals: 01300

1.03 SUBMITTALS

- A. Submit shop drawings in accordance with Section 01300.
- B. In submitted catalog cuts, cross out items shown that are not pertinent to this project. Where catalog cuts list manufacturer's standard options, cross out those options not intended to be provided and clearly highlight those options that are to be provided.

1.04 REGULATORY AGENCIES AND STANDARDS

- A. Electrical work shall comply with the NEC as amended by the CEC and local city code where applicable.

1.05 QUALITY CONTROL

- A. Materials, appliances, equipment, and devices shall conform to the applicable UL standards. The label of, or listing by, UL is required for all electrical equipment.

1.06 ELECTRIC UTILITY SERVICE

- A. Provide for and perform all coordination with the electric utility company to obtain electric service for the project as shown on the Single Line Diagram drawings. Preliminary coordination with the electric utility company has been performed and the drawings include underground service conduits, and transformer pad locations per utility company requirements. Contractor to contact the electric utility company and perform all remaining coordination to include and construct all facilities in the

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project required to obtain the electric service for the project as required by the serving utility company.

1.07 POWER FOR CONSTRUCTION

- A. Provide for or purchase power for construction in accordance and as outlined in respective specification sections and General Conditions.

1.08 LOCATION

- A. General: Use equipment, materials, and wiring methods suitable for the types of locations in which they are located as defined below.
- B. Definitions of Types of Locations:
 - 1. Wet Locations: Locations exposed to the weather, whether under a roof or not, unless otherwise designated in the drawings.
 - 2. Corrosive Locations: As defined on the Drawings.

1.09 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Similar materials and equipment shall be the product of a single manufacturer.
- B. Provide only products which are new, undamaged, and in the original cartons or containers.
- C. Materials and equipment shall be the standard products of manufacturers regularly engaged in the production of such material and shall be the manufacturer's current design.
- D. Materials and equipment shall be suitable for storage, installation, and operation at an ambient temperature of 0°C to 40°C except where more stringent conditions are stated in individual equipment specifications.
- E. Electrical equipment and panels shall be factory finished with manufacturer's standard primer and enamel topcoats, unless stated otherwise in the individual equipment specifications. Provide 1 pint of the equipment manufacturer's

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touchup paint per 500 square feet of painted surface for repair of damaged enamel topcoats.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Provide modifications for a safe and properly operating installation in accordance with the equipment manufacturer's recommendations.
- B. The Contract Documents indicate the desired locations. Field determine exact location based on physical size and arrangement of equipment, finished elevations, and obstructions.
- C. Work or equipment not indicated or specified which is necessary for the complete and proper operation of the electrical systems shall be accomplished without additional cost to the COUNTY.
- D. Accomplish work required to pierce any waterproofing after the part piercing the waterproofing has been set in place. Seal and make watertight the openings made for this purpose.
- E. Install equipment and material piercing fire walls and fire-resistant or fire-stopped walls, partitions, ceilings, and floors in a manner so the rating remains equivalent.
- F. Seal weathertight equipment or components exposed to the weather.

Protect equipment outlets and conduit openings with factory-made plugs or caps whenever work is not in progress at that point.

END OF SECTION

SECTION 26 01 26
MAINTENANCE TESTING OF ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section includes general requirements for electrical field testing and inspecting. Detailed requirements are specified in each Section containing components that require testing. General requirements include the following:
 - 1. Qualifications of testing agencies and their personnel.
 - 2. Suitability of test equipment.
 - 3. Calibration of test instruments.
 - 4. Coordination requirements for testing and inspecting.
 - 5. Reporting requirements for testing and inspecting.

1.02 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.03 QUALITY ASSURANCE

- A. Testing Agency Qualifications: As specified in each Section containing electrical testing requirements and in subparagraph and associated subparagraph below.
 - 1. Testing Agency's Field Supervisor for Power Component Testing: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Division 16 power component Sections.
- B. Test Equipment Suitability: Comply with NETA ATS, Section 5.2.
- C. Test Equipment Calibration: Comply with NETA ATS, Section 5.3.

1.04 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – NOT USED

PART 3 – EXECUTION

3.01 GENERAL TESTS AND INSPECTIONS

- A. If a group of tests are specified to be performed by an independent testing agency, prepare systems, equipment, and components for tests and inspections, and perform preliminary tests to ensure that systems, equipment, and components are ready for independent agency testing. Include the following minimum preparations as appropriate:
 - 1. Perform insulation-resistance tests.
 - 2. Perform continuity tests.
 - 3. Perform rotation test (for motors to be tested).
 - 4. Provide a stable source of single-phase, 208/120-V electrical power for test instrumentation at each test location.
- B. Test and Inspection Reports: In addition to requirements specified elsewhere, report the following:
 - 1. Manufacturer's written testing and inspecting instructions.
 - 2. Calibration and adjustment settings of adjustable and interchangeable devices involved in tests.
 - 3. Tabulation of expected measurement results made before measurements.
 - 4. Tabulation of "as-found" and "as-left" measurement and observation results.

END OF SECTION

SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

1.02 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.04 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.05 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.

1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

1.06 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 CONDUCTORS AND CABLES

- A. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.

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- B. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN-2-THWN-2.

2.02 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.03 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

PART 3 – EXECUTION

3.01 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

3.02 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type THHN-2-THWN-2, single conductors in raceway.
- B. Exposed Feeders: Type THHN-2-THWN-2, single conductors in raceway.

3.03 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 16130 "Raceways and Boxes" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

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- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

3.04 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.05 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 16075 "Electrical Identification."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.06 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Performing NETA tests on all conductors and cables can be expensive. Consider limiting testing to a certain group of conductors, such as service entrance and feeder conductors, or to those conductors feeding critical equipment and services. To require all conductors and cables to be tested, delete options in first subparagraph below.
 - 2. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 - 3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- B. Test and Inspection Reports: Prepare a written report to record the following:
 - 1. Procedures used.
 - 2. Results that comply with requirements.

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3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- C. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes grounding and bonding systems and equipment.

1.02 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. As-Built Data: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:
 - 1. Ground rods.
- C. Qualification Data: For testing agency and testing agency's field supervisor.
- D. Field quality-control reports.

1.04 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with UL 467 for grounding and bonding materials and equipment.

1.05 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.02 CONDUCTORS

- A. Insulated Conductors: wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

2.03 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- D. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.04 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet.

PART 3 – EXECUTION

3.01 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

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B. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.02 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.03 GROUNDING SEPARATELY DERIVED SYSTEMS

- A. Generator: Install grounding electrode(s) at the generator location. The electrode shall be connected to the equipment grounding conductor and to the frame of the generator.

3.04 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
1. Feeders and branch circuits.
 2. Lighting circuits.
 3. Receptacle circuits.
 4. Single-phase motor and appliance branch circuits.
- C. Flexible raceway runs.

3.05 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.

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2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Section 02584 "Underground Ducts and Utility Structures," and shall be at least 12 inches deep, with cover.
 1. Test Wells: Install at least one test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.
- D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- E. Grounding and Bonding for Piping:
 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

3.06 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure

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- grounding terminal. Make tests at ground rods before any conductors are connected.
- a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
 - 4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Report measured ground resistances that exceed the following values:
- 1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
- F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION

SECTION 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY OF WORK

- A. Section Includes:
 - 1. Metal conduits, tubing, and fittings.
 - 2. Boxes, enclosures, and cabinets.

1.02 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 DEFINITIONS

- A. ARC: Aluminum rigid conduit.
- B. GRC: Galvanized rigid steel conduit.
- C. IMC: Intermediate metal conduit.

1.04 SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.05 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 METAL CONDUITS, TUBING, AND FITTINGS

- A. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. GRC: Comply with ANSI C80.1 and UL 6.
- C. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
 - 1. Comply with NEMA RN 1.
 - 2. Coating Thickness: 0.040 inch minimum.
- D. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- E. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
 - 1. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch with overlapping sleeves protecting threaded joints.
- F. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.02 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.
- C. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- D. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb. shall be listed and marked for the maximum allowable weight.
- E. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- F. Device Box Dimensions: 4 inches by 2-1/8 inches by 2-1/8 inches deep.
- G. Gangable boxes are prohibited.

PART 3 – EXECUTION

3.01 INSTALLATION – WOOD

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.
- C. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- D. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- E. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- F. Device Box Dimensions: 4 inches by 2-1/8 inches by 2-1/8 inches deep.
- G. Gangable boxes are prohibited.

3.02 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. .Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- E. Support conduit within 12 inches of enclosures to which attached.
- F. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

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- G. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- H. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- I. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- J. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- K. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- L. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- M. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- N. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- O. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Where otherwise required by NFPA 70.
- P. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

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1. Use LFMC in damp or wet locations subject to severe physical damage.
 2. Use LFMC in damp or wet locations not subject to severe physical damage.
- Q. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- R. Locate boxes so that cover or plate will not span different building finishes.
- S. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- T. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.03 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Warning labels and signs.
5. Equipment identification labels.
6. Miscellaneous identification products.

1.02 RELATED WORK

- A.** Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 ACTION SUBMITTALS

- A.** Product Data: For each electrical identification product indicated.
- B.** Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C.** Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.04 QUALITY ASSURANCE

- A.** Retain IEEE C2 in first paragraph below for projects with electrical utility work, including underground and overhead distribution and medium-voltage cabling. By reference, IEEE C2 requires compliance with ANSI Z531.1 through ANSI Z531.5. See Evaluations for additional description of the scope of these standards.
- B.** Comply with NFPA 70.
- C.** Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D.** Comply with ANSI Z535.4 for safety signs and labels.
- E.** Retain paragraph below if retaining self-adhesive products in Part 2. See Editing Instruction No. 1 in the Evaluations.

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- F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.05 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

1.06 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 POWER AND CONTROL RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- C. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.
- D. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter

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sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

- E. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

2.02 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.
- B. Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.
- C. Self-Adhesive, Self-Laminating Polyester Labels: Preprinted, 3-mils thick flexible label with acrylic pressure-sensitive adhesive that provides a clear, weather- and chemical-resistant, self-laminating, protective shield over the legend. Labels sized to fit the cable diameter such that the clear shield overlaps the entire printed legend.
- D. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of cable it identifies and to stay in place by gripping action.

2.03 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Self-Adhesive, Self-Laminating Polyester Labels: Preprinted, 3-mils thick flexible label with acrylic pressure-sensitive adhesive that provides a clear, weather- and chemical-resistant, self-laminating, protective shield over the legend. Labels sized to fit the conductor diameter such that the clear shield overlaps the entire printed legend.
- C. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

2.04 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.

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- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

2.05 EQUIPMENT IDENTIFICATION LABELS

- A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

2.06 CABLE TIES

- A. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength at 73 deg F , According to ASTM D 638: 12,000 psi .
 - 3. Temperature Range: Minus 40 to plus 185 deg F .
 - 4. Color: Black.

2.07 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

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- F. Attach plastic raceway and cable labels that are not self-adhesive type with clear vinyl tape with adhesive appropriate to the location and substrate.

3.02 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl label. Install labels at 10-foot maximum intervals.
- B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
 - 1. Power.
- C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
 - 1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.
 - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
 - b. Colors for 240/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - c. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- D. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive vinyl labels with the conductor or cable designation, origin, and destination.
- E. Control-Circuit Conductor Termination Identification: For identification at terminations provide self-adhesive vinyl labels with the conductor designation.
- F. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
 - 1. Comply with 29 CFR 1910.145.
 - 2. Identify system voltage with black letters on an orange background.
 - 3. Apply to exterior of door, cover, or other access.

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- G. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- H. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
 - 1. Labeling Instructions:
 - a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch high letters on 1-1/2-inch high label; where two lines of text are required, use labels 2 inches high.
 - b. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
 - 2. Equipment to Be Labeled:
 - a. Identification labeling of some items listed below may be required by individual Sections or by NFPA 70.
 - b. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be engraved, laminated acrylic or melamine label.
 - c. Enclosures and electrical cabinets.
 - d. Motor-control centers.
 - e. Enclosed switches.
 - f. Enclosed controllers.
 - g. Monitoring and control equipment.
 - h. UPS equipment.

END OF SECTION

**SECTION 26 05 73
POWER SYSTEM STUDIES**

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section includes computer-based, arc flash hazard study, fault-current and overcurrent protective device coordination studies, and the setting of these devices.

1.02 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.03 SUBMITTALS

- A. Product Data: For computer software program to be used for studies.
- B. Qualification Data:
 - 1. For arc flash study, short circuit and coordination-study specialist; qualification data shall demonstrate a minimum of five years of experience producing studies for similar scope of work projects.
 - 2. For testing agency; qualification data shall demonstrate a minimum of five years of experience testing circuits breaker for similar scope of work projects.
- C. Other Action Submittals:
 - 1. Short Circuit and Coordination-study input data, including completed computer program input data sheets and single line diagram of existing services and new distribution.
 - 2. Short Circuit and Coordination-study report.
 - 3. Equipment evaluation report.
 - 4. Arc flash hazard study report.
 - 5. Setting report.
 - 6. Recommendations
 - 7. Final approved study in PDF format on CD

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1.04 QUALITY ASSURANCE

- A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are not acceptable.
- B. Coordination-Study Specialist Qualifications: An organization experienced in the application of computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
- C. Testing Agency Qualifications: An organization experienced in the setting of adjustable trip circuit breakers and testing of circuit breaker trip functions.

1.05 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 COMPUTER SOFTWARE DEVELOPERS

- A. Computer Software Developers: Subject to compliance with requirements, provide computer software programs developed by one of the following:
 - 1. EDSA Micro Corporation.
 - 2. Electrical Systems Analysis, Inc.
 - 3. SKM Systems Analysis, Inc.

2.02 COMPUTER SOFTWARE PROGRAM REQUIREMENTS

- A. Comply with IEEE 399.
- B. Analytical features of fault-current-study computer software program shall include "mandatory," "very desirable," and "desirable" features as listed in IEEE 399, Table 7-4.
- C. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices.

1. Optional Features:
 - a. Arcing faults.
 - b. Simultaneous faults.
 - c. Explicit negative sequence.
 - d. Mutual coupling in zero sequence.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. All adjustable trip circuit breaker are to be coordinated.
- B. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices not submitted for approval may not be used in study.

3.02 FAULT-CURRENT STUDY

- A. Source Impedance: Utility company's fault-current contribution as indicated.
- B. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project and use approved computer software program to calculate values. Include studies of system-switching configurations and alternate operations that could result in maximum fault conditions.
- C. Calculate interrupting duties on the basis of maximum available fault current.
- D. Calculations to verify interrupting ratings of overcurrent protective devices shall comply with the following:
 1. Low-Voltage Circuit Breakers: IEEE 1015 and IEEE C37.50.
 2. Low-Voltage Fuses: IEEE C37.46.
 3. Circuit Breakers: IEEE C37.13.
- E. Study Report: Enter calculated X/R ratios and interrupting (5-cycle) fault currents on electrical distribution system diagram of the report.
- F. Equipment Evaluation Report: Prepare a report on the adequacy of overcurrent protective devices and conductors by comparing fault-current ratings of these devices with calculated fault-current momentary and interrupting duties.

3.03 COORDINATION STUDY

- A. Gather and tabulate the following input data to support coordination study:
 - 1. Product Data for overcurrent protective devices specified in other Division 16 Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
 - 2. Impedance of utility service entrance.
 - 3. Electrical distribution system diagram showing the following:
 - a. Circuit-breaker and fuse-current ratings and types.
 - b. Transformer kilovolt amperes, primary and secondary voltages, connection type, impedance, and X/R ratios.
 - c. Generator kilovolt amperes, size, voltage, and source impedance.
 - d. . Indicate conduit material, sizes of conductors, conductor insulation, and length.
 - e. Busway ampacity and impedance.
 - f. Motor horsepower designation.
- B. Perform coordination study and prepare a written report using the results of fault-current study and approved computer software program. Comply with IEEE 399.
- C. Comply with NFPA 70 for overcurrent protection of circuit elements and devices.
- D. Transformer Primary Overcurrent Protective Devices:
 - 1. Device shall not operate in response to the following:
 - a. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
 - b. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.
 - 2. Device shall protect transformer according to IEEE C57.12.00, for fault currents.
- E. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and conductor melting curves in IEEE 242. Verify adequacy of phase conductors at maximum three-phase bolted fault currents, equipment grounding conductors, and grounding electrode conductors at maximum ground-fault currents.
- F. Coordination-Study Report: Prepare a written report indicating the following results of coordination study:
 - 1. Tabular Format of Settings Selected for Overcurrent Protective Devices:
 - a. Device tag.

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- b. Circuit-breaker sensor rating; and long-time, short-time, and instantaneous settings.
 - c. Fuse-current rating and type.
- 2. Coordination Curves: Prepared to determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between series devices, including power utility company's upstream devices. Show the following specific information:
 - a. Device tag.
 - b. Voltage and current ratio for curves.
 - c. Three-phase and single-phase damage points for each transformer.
 - d. No damage, melting, and clearing curves for fuses.
 - e. Cable damage curves.
 - f. Transformer inrush points.
 - g. Maximum fault-current cutoff point.
- 3. Completed data sheets for setting of overcurrent protective devices.

3.04 ARC FLASH HAZARD STUDY

- A. Perform an arc flash hazard study after the short circuit and protective device coordination study has been completed based upon IEEE standard 1584 "IEEE Guide for Performing Arc Flash Hazard Calculation".
- B. The study shall be calculated by means of the computer software package. Pertinent data, rationale employed, and assumptions in developing the calculations shall be incorporated in the introductory remarks of the study.
- C. The study shall be in accordance with applicable NFPA 70E, OSHA 29-CFR, part 1910 Sub part S and IEEE 1584 Standards.
- D. Determine the following:
 - 1. Flash Hazard Protection Boundary in inches.
 - 2. Limited Approach Boundary.
 - 3. Restricted Boundary.
 - 4. Prohibited Boundary.
 - 5. Incident Energy Level.
 - 6. Required Personal Protective Equipment Class.
 - 7. Type of Fire Rating Clothing.
- E. Produce an Arc Flash Warning label based on the results of the incident energy study. Install a warning label (orange ≤ 40 cal/cm²) or danger label (red > 40 cal/cm²) approximately 3"X4" (Brady multi color or equal) for every point in the system as specified in accordance with ANSI Z535.4-2002. The label must be suitable for indoor or outdoor environments for at least 3 years

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and contain listing items 1 - 7 above. Also include the large “Warning” or “Danger” on the top; “Arc Flash and Shock Hazard” appropriate PPE required; equipment/bus name, system operating voltage, and date of issue.

- F. Produce Bus Detail sheets that listed the items D 1 - 7 from above and the following traditional items:
 - 1. Bus Name.
 - 2. Upstream Protective Device Name, Type and Settings.
 - 3. Bus Line to Line Voltage.

- G. Produce Arc Flash Evaluation Summary Sheet listing the following additional items:
 - 1. Bus Name.
 - 2. Upstream Protective Device Name, Type and Settings.
 - 3. Bus Line to Line Voltage.
 - 4. Bus Bolted Fault
 - 5. Protective Device Bolted Fault Current.
 - 6. Arcing Fault Current.
 - 7. Protective Device Trip/Delay Time.
 - 8. Breaker Opening Time.
 - 9. Solidly Grounded Column.
 - 10. Equipment Type.
 - 11. Gap.
 - 12. Arc Flash Boundary.
 - 13. Working Distance.
 - 14. Incident Energy.
 - 15. Required Protective Fire Rated Clothing Type and Class.

3.05 OVERCURRENT PROTECTIVE DEVICE SETTING

- A. Testing: Engage a qualified testing agency to perform the following device setting and to prepare test reports.
 - 1. After installing overcurrent protective devices and during energizing process of electrical distribution system, perform the following:
 - a. Verify that overcurrent protective devices meet parameters used in studies.
 - 2. Adjust devices to values listed in study results.

END OF SECTION

SECTION 26 24 13
SWITCHBOARDS

PART 1 – GENERAL

1.01 SUMMARY OF WORK:

A. Section Includes:

1. Service and distribution switchboards rated 600 V and less.
2. Disconnecting and overcurrent protective devices.
3. Accessory components and features.
4. Identification.

1.02 RELATED WORK

- A.** Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 SUBMITTALS

- A.** Product Data: For each type of switchboard, overcurrent protective device, transient voltage suppression device, ground-fault protector, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
- B.** Shop Drawings: For each switchboard and related equipment.
1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings.
 2. Detail enclosure types for types other than NEMA 250, Type 1.
 3. Detail bus configuration, current, and voltage ratings.
 4. Detail short-circuit current rating of switchboards and overcurrent protective devices.
 5. Include descriptive documentation of optional barriers specified for electrical insulation and isolation.
 6. Include evidence of NRTL listing for series rating of installed devices.
 7. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 8. Include schematic and wiring diagrams for power, signal, and control wiring.
- C.** Seismic Qualification Certificates: Submit certification that switchboards, overcurrent protective devices, accessories, and components will withstand

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seismic forces defined in Division 16 Section "Vibration and Seismic Controls for Electrical Systems." Include the following:

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- D. Field Quality-Control Reports:
1. Test procedures used.
 2. Test results that comply with requirements.
 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- E. Operation and Maintenance Data: For switchboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section "Operation and Maintenance Data," include the following:
1. Routine maintenance requirements for switchboards and all installed components.
 2. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers qualified as defined in NEMA PB 2.1 and trained in electrical safety as required by NFPA 70E.
- B. Testing Agency Qualifications: Member company of NETA or an NRTL.
- C. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- D. Source Limitations: Obtain switchboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- F. Comply with NEMA PB 2.
- G. Comply with NFPA 70.

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H. Comply with UL 891.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver switchboards in sections or lengths that can be moved past obstructions in delivery path.
- B. Handle and prepare switchboards for installation according to NECA 400.

1.06 PROJECT CONDITIONS

- B. Installation Pathway: Remove and replace access fencing, doors, lift-out panels, and structures to provide pathway for moving switchboards into place.
- C. Environmental Limitations:
 - 1. Do not deliver or install switchboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above switchboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 - 2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Not exceeding 104 deg F.
 - b. Altitude: Not exceeding 6600 feet.
- D. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 - 1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of electric service.
 - 2. Indicate method of providing temporary electric service.
 - 3. Do not proceed with interruption of electric service without Construction Manager's written permission.
 - 4. Comply with NFPA 70E.

1.07 COORDINATION

- A. Coordinate layout and installation of switchboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace

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clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

- B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.

1.08 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices that fail in materials or workmanship within specified warranty period.

- 1. Warranty Period: Five years from date of Substantial Completion.

1.09 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS:

2.01 MANUFACTURED UNITS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. Front-Connected, Front-Accessible Switchboards:
 - 1. Main Devices: Panel mounted.
 - 2. Branch Devices: Panel mounted.
 - 3. Sections front and rear aligned.
- C. Seismic Requirements: Fabricate and test switchboards according to IEEE 344 to withstand seismic forces.
- D. Enclosure Finish for Indoor Units: Factory-applied finish in manufacturer's standard gray finish over a rust-inhibiting primer on treated metal surface.

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- E. Outdoor Enclosures: Type 3R.
 - 1. Finish: Factory-applied finish in manufacturer's standard color; undersurfaces treated with corrosion-resistant undercoating.
 - 2. Enclosure: Downward, rearward sloping roof; for each section, with provisions for padlocking.
 - 3. Power for Space Heaters, Ventilation, Lighting, and Receptacle: Include a control-power transformer within the switchboard. Supply voltage shall be 120-V ac.
- F. Barriers: Between adjacent switchboard sections.
- G. Cubical Space Heaters: Factory-installed electric space heaters of sufficient wattage in each vertical section to maintain enclosure temperature above expected dew point.
 - 1. Space-Heater Control: Thermostats to maintain temperature of each section above expected dew point.
 - 2. Space-Heater Power Source: Transformer, factory installed in switchboard.
- H. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.
- I. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.
- J. Buses and Connections: Three phase, four wire unless otherwise indicated.
 - 1. Phase- and Neutral-Bus Material: Hard-drawn copper of 98 percent conductivity, silver-plated, or tin-plated, high-strength, electrical-grade aluminum alloy.
 - 2. Ground Bus: 1/4-by-2-inch- hard-drawn copper of 98 percent conductivity, equipped with mechanical connectors for feeder and branch-circuit ground conductors.
 - 3. Main Phase Buses and Equipment Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
 - 4. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with mechanical connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.
- K. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.
- L. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components including instruments and instrument transformers.

2.02 DESIGN REQUIREMENTS

- A. Seismic Performance: Switchboards shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

2.03 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.
1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
 3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
 - a. Instantaneous trip.
 - b. Long- and short-time pickup levels.
 - c. Long- and short-time time adjustments.
 - d. Ground-fault pickup level, time delay, and I²t response.
 4. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor material.
 - c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.

2.04 ACCESSORY COMPONENTS AND FEATURES

- A. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

2.05 IDENTIFICATION

- A. Service Equipment Label: NRTL labeled for use as service equipment for switchboards with one or more service disconnecting and overcurrent protective devices.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Receive, inspect, handle, and store switchboards according to NECA 400.
- B. Examine switchboards before installation. Reject switchboards that are moisture damaged or physically damaged.
- C. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install switchboards and accessories according to NECA 400.
- B. Equipment Mounting: Install switchboards on concrete base, 4-inch nominal thickness.
 - 1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 - 2. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 - 3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 4. Install anchor bolts to elevations required for proper attachment to switchboards.
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from switchboard units and components.
- D. Operating Instructions: Frame and mount the printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.
- E. Install filler plates in unused spaces of panel-mounted sections.
- F. Install overcurrent protective devices, transient voltage suppression devices, and instrumentation.

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1. Set field-adjustable switches and circuit-breaker trip ranges.
- G. Comply with NECA 1.

3.03 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with requirements for identification specified in Division 16 Section "Electrical Identification."
- B. Switchboard Nameplates: Label each switchboard compartment with a nameplate complying with requirements for identification specified in Division 16 Section "Electrical Identification."
- C. Device Nameplates: Label each disconnecting and overcurrent protective device and each meter and control device mounted in compartment doors with a nameplate complying with requirements for identification specified in Division 16 Section "Electrical Identification."

3.04 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Acceptance Testing Preparation:
1. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit.
 2. Test continuity of each circuit.
- C. Tests and Inspections:
1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 3. Perform the following infrared scan tests and inspections and prepare reports:
 - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switchboard. Remove front panels so joints and connections are accessible to portable scanner.
 4. Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 5. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

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- D. Switchboard will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.05 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.
- B. Set field-adjustable circuit-breaker trip ranges as specified in Division 16 Section "Overcurrent Protective Device Coordination."

3.06 PROTECTION

- A. Temporary Heating: Apply temporary heat, to maintain temperature according to manufacturer's written instructions, until switchboard is ready to be energized and placed into service.

3.07 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain switchboards, overcurrent protective devices, instrumentation, and accessories.

END OF SECTION

**SECTION 26 24 16
PANELBOARDS**

PART 1 - GENERAL

1.01 SUMMARY OF WORK:

- A. This Section includes the following:
 - 1. Lighting and appliance branch-circuit panelboards.

1.02 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.03 SUBMITTALS

- A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
 - 2. Detail enclosure types and details for types other than NEMA 250, Type 1.
 - 3. Detail bus configuration, current, and voltage ratings.
 - 4. Short-circuit current rating of panelboards and overcurrent protective devices.
 - 5. Include evidence of NRTL listing for series rating of installed devices.
 - 6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 - 7. Include wiring diagrams for power, signal, and control wiring.
- C. Qualification Data: For qualified testing agency.
- D. Seismic Qualification Certificates: Submit certification that panelboards, overcurrent protective devices, accessories, and components will withstand seismic forces. Include the following:
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

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2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

E. Field Quality-Control Reports:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

F. Panelboard Schedules: For installation in panelboards.

G. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section "Operation and Maintenance Data," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.

1.04 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Comply with NEMA PB 1.
- E. Comply with NFPA 70.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Remove loose packing and flammable materials from inside panelboards; install temporary electric heating (250 W per panelboard) to prevent condensation.
- B. Handle and prepare panelboards for installation according to NECA 407.

1.06 PROJECT CONDITIONS

- A. Environmental Limitations:

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1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete.
2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Not exceeding 23 deg F to plus 104 deg F.
 - b. Altitude: Not exceeding 1000 feet.
- B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by AGENCY or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of electric service.
 2. Do not proceed with interruption of electric service without Construction Manager's written permission.
 3. Comply with NFPA 70E.

1.07 COORDINATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.

1.08 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices that fail in materials or workmanship within specified warranty period.
 1. Warranty Period: Five years from date of Substantial Completion.

1.09 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 22 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 - PRODUCTS

2.01 DESIGN REQUIREMENTS

- A. Seismic Performance: Panelboards shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
 - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
- B. Fabricate and test panelboards according to IEEE 344 to withstand seismic forces.
- C. Enclosures: Surface-mounted cabinets.
 - 1. Rated for environmental conditions at installed location.
 - a. Wet or Damp Indoor Locations: NEMA 250, Type 4X Stainless Steel.
 - 2. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
 - 3. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components.
 - 4. Directory Card: Inside panelboard door, mounted in transparent card holder.
- D. Incoming Mains Location: Top and bottom.
- E. Phase, Neutral, and Ground Buses:
 - 1. Material: Hard-drawn copper, 98 percent conductivity.
 - 2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
- F. Conductor Connectors: Suitable for use with conductor material and sizes.
 - 1. Material: Hard-drawn copper, 98 percent conductivity.
 - 2. Main and Neutral Lugs: Mechanical type.
 - 3. Ground Lugs and Bus-Configured Terminators: Compression type.
- G. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- H. Panelboard Short-Circuit Current Rating: Fully Rated for fault duty indicated.

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2.02 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Mains: Circuit breaker or lugs only.
- D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.03 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with series-connected rating to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - 2. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
 - c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.

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- d. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.

2.04 ACCESSORY COMPONENTS AND FEATURES

- A. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Receive, inspect, handle, and store panelboards according to NECA 407.
- B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.
- C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install panelboards and accessories according to NECA 407.
- B. Mount top of trim 90 inches above finished floor unless otherwise indicated.
- C. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- D. Install overcurrent protective devices and controllers not already factory installed.
 - 1. Set field-adjustable, circuit-breaker trip ranges.
- E. Install filler plates in unused spaces.
- F. Arrange conductors in gutters into groups and bundle and wrap with wire ties.
- G. Comply with NECA 1.

3.03 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Division 16 Section "Electrical Identification."
- B. Create a directory to indicate installed circuit loads; incorporate AGENCY's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

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- C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Division 16 Section "Electrical Identification."

3.04 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Panelboards will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.05 ADJUSTING

- A. Adjust moving parts and operable component to function smoothly and lubricate as recommended by manufacturer.

3.06 PROTECTION

- A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer's written instructions.

END OF SECTION

SECTION 26 27 26
WIRING DEVICES

PART 1 - GENERAL

1.01 SUMMARY OF WORK

A. Section Includes:

1. Receptacles, receptacles with integral GFCI, and associated device plates.
2. Weather-resistant receptacles.
3. Snap switches.

1.02 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

1.05 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

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1.06 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

1.07 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 22 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Provide products from one of the following Manufacturers or equal:
 - 1. Hubbell
 - 2. Leviton
- B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.02 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

2.03 STRAIGHT-BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.

2.04 GFCI RECEPTACLES

- A. General Description:
 - 1. Straight blade, non-feed-through type.
 - 2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.
 - 3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

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- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:

2.05 TOGGLE SWITCHES

- A. Comply with NEMA WD 1, UL 20, and FS W-S-896.
- B. Switches, 120/277 V, 20 A:
 - 1. Single Pole:

2.06 WALL PLATES

- A. Single and combination types shall match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: Type 302 stainless steel 0.04-inch-(1-mm-) thick,
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum.

2.07 FINISHES

- A. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: Stainless Steel.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
 - 1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 - 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
 - 1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.

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2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
- D. Device Installation:
1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
 6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
 8. Tighten unused terminal screws on the device.
 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
- E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

3.02 GFCI RECEPTACLES

- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.03 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."

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- B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.04 FIELD QUALITY CONTROL

- A. Tests for Convenience Receptacles:
1. Line Voltage: Acceptable range is 105 to 132 V.
 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions remove malfunctioning units and replace with new ones, and retest as specified above.
- B. Wiring device will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION

**SECTION 26 00 50
LIGHTING**

PART 1 - GENERAL

1.01 SUMMARY OF WORK:

- A. This Section includes the following:
 - 1. Building mounted interior and exterior lighting fixtures.
 - 2. Pole mounted exterior lighting fixtures.

1.02 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.03 SUBMITTALS

- A. Product Data: For each type of lighting fixture scheduled, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:
 - 1. Physical description of fixture, including dimensions and verification of indicated parameters.
 - 2. LED's and Driver
- B. Wiring Diagrams: Power, signal, and control wiring.
- C. Source quality-control test reports.
- D. Warranties: Special warranties specified in this Section.

1.04 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

1.05 WARRANTY

- A. Special Warranty for LED lighting fixtures: Manufacturer's standard form in which manufacturer agrees to repair or replace units that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period for LED driver light engine, and housing: 10 years from date of Substantial Completion.

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1.06 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Provide products per manufacturer as indicated on the drawings.

2.02 FIXTURES AND COMPENENTS, GENERAL

- A. Metal Parts: Free of burrs and sharp corners and edges.
- B. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
- C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- D. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
 - 1. White Surfaces: 85 percent.
 - 2. Specular Surfaces: 83 percent.
 - 3. Diffusing Specular Surfaces: 75 percent.
 - 4. Laminated Silver Metallized Film: 90 percent.
- E. Plastic Diffusers, Covers, and Globes:
 - 1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - 1) Lens Thickness: At least 0.125 inch minimum unless different thickness is scheduled.
 - 2) UV stabilized.
 - 2. Glass: Annealed crystal glass, unless otherwise indicated.

2.03 FINISHES

- A. Fixtures: Manufacturers' standard, unless otherwise indicated.
 - 1. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.

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2. Metallic Finish: Corrosion resistant.

2.04 SOURCE QUALITY CONTROL

- A. Factory test fixtures and certify results for electrical ratings and photometric data.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Fixtures: Set level, plumb, and square with building structural elements.
B. Fixture Support: As specified on the drawings:

3.02 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.03 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
B. Verify normal operation of each fixture after installation.
C. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.
D. Corroded Fixtures: During warranty period, replace fixtures that show any signs of corrosion.

END OF SECTION

SECTION 31 10 00
SITE CLEARING

PART 1 – GENERAL

1.01 DEFINITIONS

- A. Interfering or Objectionable Material: Trash, rubbish, and junk; vegetation and other organic matter, whether alive, dead, or decaying; topsoil.
- B. Clearing: Removal of interfering or objectionable material lying on or protruding above ground surface.
- C. Grubbing: Removal of vegetation and other organic matter including stumps, buried logs, and roots greater than 2-inch caliper to a depth of 6 inches below subgrade.
- D. Scalping: Removal of sod without removing more than upper 3 inches of topsoil.
- E. Stripping: Removal of topsoil remaining after applicable scalping is completed.
- F. Project Limits: Areas, as shown on plans

1.02 SUBMITTALS

- A. Action Submittals: Drawings clearly showing clearing, grubbing, and stripping limits.

1.03 QUALITY ASSURANCE

- A. Obtain Engineer's approval of staked clearing, grubbing, and stripping limits, prior to commencing clearing, grubbing, and stripping.

1.04 SCHEDULING AND SEQUENCING

- A. Prepare Site only after adequate erosion and sediment controls are in place. Limit areas exposed uncontrolled to erosion during installation of temporary erosion and sediment controls

1.05 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.

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- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

- A. Clear, grub, and strip areas actually needed for waste disposal, borrow, or Site improvements within limits shown or specified.
- B. Do not injure or deface vegetation that is not designated for removal.

3.02 LIMITS

- A. As follows, but not to extend beyond Project limits.
 - 1. Excavation Excluding Trenches: 5 feet beyond top of cut slopes.
 - 2. Trench Excavation: 4 feet from trench centerline, regardless of actual trench width
 - 3. Fill:
 - a. Clearing and Grubbing: 5 feet beyond toe of permanent fill.
 - b. Stripping and Scalping: 2 feet beyond toe of permanent fill.
 - 4. Waste Disposal:
 - a. Clearing: To pavement edge.
 - b. Scalping and Stripping: Not required.
 - c. Grubbing: Around perimeter as necessary for neat finished appearance.
 - 5. Structures: 15 feet outside of new structures.
 - 6. Roadways: Clearing grubbing, scalping, and stripping 30 feet from roadway shoulders
 - 7. Overhead Utilities:
 - a. Clearing and Grubbing: Entire width of easements and rights-of-way.
 - b. Scalping and Stripping: Wherever grading is required.
 - 8. Other Areas: As shown
- B. Remove rubbish, trash, and junk from entire area within Project limits.

3.03 CLEARING

- A. Clear areas within limits shown or specified.
- B. Fell trees so that they fall away from facilities and vegetation not designated for removal.

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- C. Cut stumps not designated for grubbing to within 6 inches of ground surface.
- D. Cut off shrubs, brush, weeds, and grasses to within 2 inches of ground surface.

3.04 GRUBBING

- A. Grub areas within limits shown or specified.

3.05 SCALPING

- A. Do not remove sod until after clearing and grubbing is completed and resulting debris is removed.
- B. Scalp areas within limits shown or specified.

3.06 STRIPPING

- A. Do not remove topsoil until after scalping is completed.
- B. Strip areas within limits to minimum depths shown or specified. Do not remove subsoil with topsoil.
- C. Stockpile strippings, meeting requirements of Section 32 91 13, Soil Preparation, for topsoil, separately from other excavated material.

3.07 PRUNING

- A. Remove branches below the following heights:
 - 1. 13.5 feet above roadways and shoulders.
 - 2. 9 feet above sidewalks.
 - 3. 6 feet above roofs.
- B. Prune as specified in Section 32 93 00, Plants and in plans.

3.08 TREE REMOVAL OUTSIDE CLEARING LIMITS

- A. Remove Within Project Limits:
 - 1. Dead, dying, leaning, or otherwise unsound trees that may strike and damage Project facilities in falling.
 - 2. Trees designated by Plan Sheet C-3.
- B. Cut stumps off flush with ground, remove debris, and if disturbed, restore surrounding area to its original condition.

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3.09 DISPOSAL

A. Clearing and Grubbing Debris:

1. Dispose of debris offsite.
2. Debris may be buried in designated onsite disposal areas to minimum depth of 3 feet below final grade. In lieu of onsite burial, dispose of debris offsite.
3. Burning of debris onsite will not be allowed.
4. When onsite burning is not prohibited by federal, state, or local authorities, debris may be burned onsite. Control burning to prevent fire from spreading.
5. During periods when burning is prohibited by federal, state, or local authorities, debris may be stockpiled until burning ban is rescinded, provided stockpiled material does not constitute a fire hazard or interfere with or delay Work. Stockpiled material shall not remain onsite in excess of 30 days.
6. Dispose of unburned and noncombustible debris offsite.
7. Unburned and noncombustible debris may be buried in designated onsite disposal areas to a minimum depth of 3 feet below existing grade. In lieu of onsite burial, dispose of debris offsite.
8. Woody debris may be chipped. Chips may be sold to Contractor's benefit or used for landscaping onsite as mulch or uniformly mixed with topsoil, provided that resulting mix will be fertile and not support combustion. Maximum dimensions of chipped material used onsite shall be 1/4 inch by 2 inches. Dispose of chips that are unsaleable or unsuitable for landscaping or other uses with unchipped debris.
9. Limit offsite disposal of clearing and grubbing debris to locations that are approved by federal, state, and local authorities, and that will not be visible from Project.

B. Scalpings: As specified for clearing and grubbing debris.

C. Strippings:

1. Dispose of strippings that are unsuitable for topsoil or that exceed quantity required for topsoil offsite.
2. Stockpile topsoil in sufficient quantity to meet Project needs. Dispose of excess strippings as specified for clearing and grubbing.

END OF SECTION

**SECTION 31 23 16
EXCAVATION**

PART 1 – GENERAL

1.01 DEFINITIONS

- A. Common Excavation: Removal of material not classified as rock excavation.
- B. Rock Excavation:
 - 1. General: Removal of solid material which by actual demonstration cannot, in Engineer's opinion, be reasonably loosened or ripped by single-tooth, hydraulically operated ripper mounted on crawler tractor in good condition; and which must be systematically drilled and blasted or broken by power-operated hammer, hydraulic rock breaker, expansive compounds, or other similar means prior to removal.
 - 2. Trench: Removal of solid material which by actual demonstration cannot, in Engineer's opinion, be reasonably excavated with backhoe in good condition and equipped with manufacturer's standard boom, two rippers, and rock points or similar approved equipment; and which must be systematically drilled and blasted or broken by power-operated hammer, hydraulic rock breaker, expansive compounds, or other similar means prior to removal.
 - 3. Term "rock excavation" indicates removal of solid material, as specified above, and does not necessarily correspond to "rock" as implied by names of geologic formations.
 - 4. Removal of boulders larger than 1/2 cubic yard will be classified as rock excavation, if drilling and blasting or breaking them apart with power-operated hammer, hydraulic rock breaker, expansive compounds, or other similar means is both necessary and actually used for their removal.

1.02 SUBMITTALS

- A. Informational Submittals:
 - 1. Excavation Plan, Detailing:
 - a. Methods and sequencing of excavation.
 - b. Proposed locations of stockpiled excavated material.
 - c. Proposed onsite and offsite spoil disposal sites.
 - d. Numbers, types, and sizes of equipment proposed to perform excavations
 - e. Anticipated difficulties and proposed resolutions.
 - f. Reclamation of onsite spoil disposal areas.

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1.03 QUALITY ASSURANCE

- A. Provide adequate survey control to avoid unauthorized over excavation.

1.04 WEATHER LIMITATIONS

- A. Material excavated when frozen or when air temperature is less than 32 degrees F shall not be used as fill or backfill until material completely thaws.
- B. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently for proper compaction.

1.05 SEQUENCING AND SCHEDULING

- A. Demolition: Complete applicable Work specified in Section 02 41 00, Demolition, prior to excavating.
- B. Clearing, Grubbing, and Stripping: Complete applicable Work specified in Section 31 10 00, Site Clearing, prior to excavating.
- C. Dewatering: Conform to applicable requirements of Section 31 23 19.01, Dewatering, prior to initiating excavation.
- D. Excavation Support: Install and maintain, as specified in Section 31 41 00, Shoring, as necessary to support sides of excavations and prevent detrimental settlement and lateral movement of existing facilities, adjacent property, and completed Work.

1.06 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

- A. Excavate to lines, grades, and dimensions shown and as necessary to accomplish Work. Excavate to within tolerance of plus or minus 0.1 foot, except where dimensions or grades are shown or specified as maximum or minimum. Allow for forms, working space, granular base, topsoil, and similar

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items, wherever applicable. Trim to neat lines where concrete is to be deposited against earth.

- B. Do not over excavate without written authorization of Engineer.
- C. Remove or protect obstructions as shown and as specified in Section 01 50 00, Temporary Facilities and Controls, Article Protection of Work and Property.
- D. Use of explosives shall conform to requirement of Section 31 23 16.27, Blasting Controls.

3.02 UNCLASSIFIED EXCAVATION

- A. Excavation is unclassified. Complete all excavation regardless of the type, nature, or condition of the materials encountered.

3.03 CLASSIFIED EXCAVATION

- A. Excavation is classified; see Article Definitions for classifications. Notify Engineer whenever rock is encountered.
- B. Before beginning rock excavation, comply with following requirements:
 - 1. Remove overlying material as common excavation and expose rock surface for examination by Engineer.
 - 2. Demonstrate that removal of remaining material classifies as rock excavation unless waived by Engineer.
 - 3. Assist Engineer with measurement and documentation of rock excavation.
- C. Predrilling and blasting may be allowed prior to removal of overburden if, in Engineer's opinion, top-of-rock line can be clearly defined after excavation. Acceptance of this method will be based on the following demonstration:
 - 1. Predrill, blast, and excavate initial 100-foot long test section.
 - 2. Excavate minimum of two 20-foot long trenches to apparent rock line immediately adjacent to predrilled section for comparison.
- D. In event of disputed quantities, excavate additional correlation trenches to apparent rock as considered necessary by Engineer to resolve dispute. Engineer reserves right to stop predrilling and blasting if, in Engineer's opinion, experience indicates that accurate determination of rock quantities is not possible by this method.

3.04 TRENCH WIDTH

- A. Minimum Width of Trenches:

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1. Single Pipes, Conduits, Direct-Buried Cables, and Duct Banks:
 - a. Less than 4-inch Outside Diameter or Width: 18 inches.
 - b. Greater than 4-inch Outside Diameter or Width: 18 inches greater than outside diameter or width of pipe, conduit, direct-buried cable, or duct bank.
 2. Multiple Pipes, Conduits, Cables, or Duct Banks in Single Trench: 18 inches greater than aggregate width of pipes, conduits, cables, duct banks, plus space between.
 3. Increase trench widths by thicknesses of sheeting.
- B. Maximum Trench Width: Unlimited, unless otherwise shown or specified, or unless excess width will cause damage to existing facilities, adjacent property, or completed Work.

3.05 PIPE BEDDING GROOVES FOR NONPERFORATED DRAIN LINES

- A. Semicircular, trapezoidal, or 90-degree-V.
- B. Excavated or plowed into trench bottom. Forming groove by compaction will not be acceptable.

3.06 EMBANKMENT AND CUT SLOPES

- A. Shape, trim, and finish cut slopes to conform with lines, grades, and cross-sections shown, with proper allowance for topsoil or slope protection, where shown.
- B. Remove stones and rock that exceed 3-inch diameter and that are loose and may roll down slope. Remove exposed roots from cut slopes.
- C. Round tops of cut slopes in soil to not less than a 6-foot radius, provided such rounding does not extend offsite or outside easements and rights-of-way, or adversely impacts existing facilities, adjacent property, or completed Work.

3.07 STOCKPILING EXCAVATED MATERIAL

- A. Stockpile excavated material that is suitable for use as fill or backfill until material is needed.
- B. Post signs indicating proposed use of material stockpiled. Post signs that are readable from all directions of approach to each stockpile. Signs should be clearly worded and readable by equipment operators from their normal seated position.
- C. Confine stockpiles to within easements, rights-of-way, and approved work areas. Do not obstruct roads or streets.

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- D. Do not stockpile excavated material adjacent to trenches and other excavations, unless excavation side slopes and excavation support systems are designed, constructed, and maintained for stockpile loads.
- E. Do not stockpile excavated materials near or over existing facilities, adjacent property, or completed Work, if weight of stockpiled material could induce excessive settlement.

3.08 DISPOSAL OF SPOIL

- A. Dispose of excavated materials, which are unsuitable or not needed for fill or backfill, in designated spoil disposal areas.
- B. Dispose of debris resulting from removal of underground facilities as specified in Section 02 41 00, Demolition, for demolition debris.
- C. Dispose of debris resulting from removal of organic matter, trash, refuse, and junk as specified in Section 31 10 00, Site Clearing, for clearing and grubbing debris.

END OF SECTION

SECTION 31 23 23
FILL AND BACKFILL

PART 1 – GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. ASTM International (ASTM):
 - a. C117, Standard Test Method for Materials Finer Than 75-Micrometers (No. 200) Sieve in Mineral Aggregates by Washing.
 - b. C136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
 - c. D75, Standard Practice for Sampling Aggregates.
 - d. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - e. D1556, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 - f. D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - g. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
 - h. D4254, Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
 - i. D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.02 DEFINITIONS

- A. Relative Compaction:
1. Ratio, in percent, of as-compacted field dry density to laboratory maximum dry density as determined in accordance with ASTM D1557.
 2. Apply corrections for oversize material to either as-compacted field dry density or maximum dry density, as determined by Engineer.
- B. Optimum Moisture Content:
1. Determined in accordance with ASTM Standard specified to determine maximum dry density for relative compaction.

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2. Determine field moisture content on basis of fraction passing 3/4-inch sieve.
- C. Relative Density: Calculated in accordance with ASTM D4254 based on maximum index density determined in accordance with ASTM D4253 and minimum index density determined in accordance with ASTM D4254.
- D. Prepared Ground Surface: Ground surface after completion of required demolition, clearing and grubbing, scalping of sod, stripping of topsoil, excavation to grade, and subgrade preparation.
- E. Completed Course: A course or layer that is ready for next layer or next phase of Work.
- F. Lift: Loose (uncompacted) layer of material.
- G. Geosynthetics: Geotextiles, geogrids, or geomembranes.
- H. Well-Graded:
 1. A mixture of particle sizes with no specific concentration or lack thereof of one or more sizes.
 2. Does not define numerical value that must be placed on coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.
 3. Used to define material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.
- I. Influence Area: Area within planes sloped downward and outward at 60-degree angle from horizontal measured from:
 1. 1 foot outside outermost edge at base of foundations or slabs.
 2. 1 foot outside outermost edge at surface of roadways or shoulder.
 3. 0.5 foot outside exterior at spring line of pipes or culverts.
- J. Borrow Material: Material from required excavations or from designated borrow areas on or near Site.
- K. Selected Backfill Material: Materials available onsite that Engineer determines to be suitable for specific use.
- L. Imported Material: Materials obtained from sources offsite, suitable for specified use.
- M. Structural Fill: Fill materials as required under structures, pavements, and other facilities.

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- N. Embankment Material: Fill materials required to raise existing grade in areas other than under structures.
- O. Standard Specifications: When referenced in this section, shall mean The Greenbook: Standard Specifications for Public Works Construction.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings: Tank manufacturer's recommendations for backfill around each buried tank.
 - 2. Samples:
 - a. Imported material taken at source.
- B. Informational Submittals:
 - 1. Manufacturer's data sheets for compaction equipment.
 - 2. Certified test results from independent testing agency.

1.04 QUALITY ASSURANCE

- A. Notify Engineer when:
 - 1. Structure or tank is ready for backfilling, and whenever backfilling operations are resumed after a period of inactivity.
 - 2. Soft or loose subgrade materials are encountered wherever embankment or site fill is to be placed.
 - 3. Fill material appears to be deviating from Specifications.

1.05 SEQUENCING AND SCHEDULING

- A. Complete applicable Work specified in Section 02 41 00, Demolition; Section 31 10 00, Site Clearing and Section 31 23 16, Excavation prior to placing fill or backfill.
- B. Backfill against concrete structures only after concrete has attained compressive strength, specified in Section 32 13 13, Concrete. Obtain Engineer's acceptance of concrete work and attained strength prior to placing backfill.
- C. Backfill around water-holding structures only after completion of satisfactory leakage tests.
- D. Backfill around buried tanks only after tank is set in position, securely anchored, and ready to be backfilled and Engineer provides authorization to backfill.

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- E. Do not place granular base, subbase, or surfacing until after subgrade has been prepared per Standard Specifications.

1.06 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 SOURCE QUALITY CONTROL

- A. Gradation Tests:
 - 1. As necessary to locate acceptable sources of imported material.
 - 2. During production of imported material, test as follows:
 - a. Granular Fill
 - b. Sand
 - c. Backfill Around Buried Tanks
 - d. Granular Drain Material
 - e. Granular Filter Material
 - f. Base Course Rock
 - g. Foundation Stabilization Rock
 - h. Crushed Rock for Substations:
 - 1) Base Course
 - 2) Finish Grade Rock
 - 3) Access Road Surfacing
 - i. Soil Cover Over Geotextiles
 - j. Soil Cover Over Geomembranes
- B. Samples: Collected in accordance with ASTM D75:
 - 1. During production of imported material, provide Samples as follows:
 - a. Granular Fill
 - b. Sand
 - c. Backfill Around Buried Tanks
 - d. Granular Drain Material
 - e. Granular Filter Material
 - f. Base Course Rock
 - g. Foundation Stabilization Rock
 - h. Crushed Rock for Substations
 - 1) Base Course
 - 2) Finish Grade Rock
 - 3) Access Road Surfacing

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- i. Soil Cover Over Geotextiles
- j. Soil Cover Over Geomembranes
- 2. Clearly mark to show source of material and intended use.

2.02 EARTHFILL

- A. Excavated material from required excavations and designated borrow sites,] free from rocks larger than 3 inches, from roots and other organic matter, ashes, cinders, trash, debris, and other deleterious materials.
- B. Material containing more than 10 percent gravel, stones, or shale particles is unacceptable
- C. Provide imported material of equivalent quality, if required to accomplish Work.

2.03 GRANULAR FILL

- A. 1-inch minus crushed gravel or crushed rock.
- B. Free from dirt, clay balls, and organic material.
- C. Well-graded from coarse to fine and containing sufficient fines to bind material when compacted, but with maximum 8 percent by weight passing No. 200 sieve.

2.04 SAND

- A. Free from clay, organic matter, or other deleterious material.
- B. Gradation as determined in accordance with ASTM C117 and ASTM C136:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1/4-inch	100
No. 4	95 - 100
No. 200	0 - 8

2.05 BACKFILL AROUND BURIED TANKS

- A. As specified for sand.

2.06 GRANULAR DRAIN MATERIAL

- A. As specified in Standard Specifications

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2.07 WATER FOR MOISTURE CONDITIONING

- A. Free of hazardous or toxic contaminants, or contaminants deleterious to proper compaction.

2.08 BASE COURSE ROCK

- A. As specified in Standard Specifications.

2.09 FOUNDATION STABILIZATION ROCK

- A. Crushed rock or pit run rock.
B. Uniformly graded from coarse to fine.
C. Free from excessive dirt and other organic material.
D. Maximum 2-1/2-inch particle size.

2.10 CRUSHED ROCK FOR SUBSTATIONS

- A. Clean, hard, durable crushed rock, free from foreign materials and washed.
B. Gradation as determined in accordance with ASTM C117 and ASTM C136.
C. Base Course:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
2 inches	-100
1-1/2 inches	95 - 100
3/4 inch	55 - 75
1/4 inch	35 - 50
No. 10	4 - 60

- D. Finish Grade Rock:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
2 inches	-100
1-1/2 inches	90 - 100
1 inch	30 - 65
3/4 inch	0 - 15

- E. Access Road Surfacing: Gradation same as for base course.

2.11 SOIL COVER OVER GEOTEXTILES

- A. Free of sharp angular pieces that may damage geotextile.

2.12 SOIL COVER OVER GEOMEMBRANES

- A. Granular material.
- B. Particle Size: Maximum 1/4 inch.
- C. Particle Shape: Rounded.

PART 3 – EXECUTION

3.01 GENERAL

- A. Keep placement surfaces free of water, debris, and foreign material during placement and compaction of fill and backfill materials.
- B. Place and spread fill and backfill materials in horizontal lifts of uniform thickness, in a manner that avoids segregation, and compact each lift to specified densities prior to placing succeeding lifts. Slope lifts only where necessary to conform to final grades or as necessary to keep placement surfaces drained of water.
- C. During filling and backfilling, keep level of fill and backfill around each structure and buried tank even.
- D. Do not place fill or backfill, if fill or backfill material is frozen, or if surface upon which fill or backfill is to be placed is frozen.
- E. If pipe, conduit, duct bank, or cable is to be laid within fill or backfill:
 - 1. Fill or backfill to an elevation 2 feet above top of item to be laid.
 - 2. Excavate trench for installation of item.
 - 3. Install bedding, if applicable.
 - 4. Install item.
 - 5. Backfill envelope zone and remaining trench, before resuming filling or backfilling specified in this section.
- F. Tolerances:
 - 1. Final Lines and Grades: Within a tolerance of 0.1 foot unless dimensions or grades are shown or specified otherwise.
 - 2. Grade to establish and maintain slopes and drainage as shown. Reverse slopes are not permitted.

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- G. Settlement: Correct and repair any subsequent damage to structures, pavements, curbs, slabs, piping, and other facilities, caused by settlement of fill or backfill material.

3.02 BACKFILL UNDER AND AROUND STRUCTURES

- A. Under Facilities: Within influence area beneath structures, slabs, pavements, curbs, piping, conduits, duct banks, and other facilities, backfill with granular fill, unless otherwise shown. Place granular fill in lifts of 6-inch maximum thickness and compact each lift to minimum of 95 percent relative compaction as determined in accordance with ASTM D1557.
- B. Subsurface Drainage: Backfill with granular drain material, where shown. Place granular drain material in lifts of 6-inch maximum thickness and compact each lift to minimum of 90 percent relative density.
- C. Other Areas: Backfill with earthfill to lines and grades shown, with proper allowance for topsoil thickness where shown. Place in lifts of 6-inch maximum thickness and compact each lift to minimum of 90% percent relative compaction as determined in accordance with ASTM D1557 Method.

3.03 BACKFILL AROUND TANKS

- A. Backfill to top of tank, unless otherwise shown, with granular fill and thoroughly water settle by saturating backfill and vibrating saturated backfill with a concrete vibrator inserted through full depth of backfill on 1-foot maximum centers.
- B. Backfill above top of tank with earthfill placed in 8-inch lifts. Compact each lift to minimum 90% percent relative compaction as determined in accordance with ASTM D1557 Method.

3.04 FILL

- A. Outside Influence Areas beneath Structures, Tanks, Pavements, Curbs, Slabs, Piping, and Other Facilities: Unless otherwise shown, place earthfill as follows:
 - 1. Allow for 6-inch thickness of topsoil where required.
 - 2. Maximum 8-inch thick lifts.
 - 3. Place and compact fill across full width of embankment.
 - 4. Compact to minimum 90% percent relative compaction as determined in accordance with ASTM D1557 Method.
 - 5. Dress completed embankment with allowance for topsoil, crest surfacing, and slope protection, where applicable.

3.05 SITE TESTING

A. Gradation:

1. One sample from each 1,500 tons of finished product or more often as determined by Engineer, if variation in gradation is occurring, or if material appears to depart from Specifications.
2. If test results indicate material does not meet Specification requirements, terminate material placement until corrective measures are taken.
3. Remove material placed in Work that does not meet Specification requirements.

B. In-Place Density Tests: In accordance with ASTM D1556. During placement of materials, test as follows:

1. Granular Fill: 3 tests per lift.
2. Sand: 3 tests per lift.
3. Backfill Around Buried Tanks:
4. Granular Drain Material: 1 test per lift
5. Granular Filter Material:
6. Base Course Rock:
7. Foundation Stabilization Rock:
8. Crushed Rock for Substations:
 - a. Base Course:
 - b. Finish Grade Rock:
 - c. Access Road Surfacing:
9. Soil Cover Over Geotextiles:
10. Soil Cover Over Geomembranes:

3.06 SAND BLANKET OVER VAPOR RETARDER

- A. Place sand in manner that avoids damage to underlying vapor retarder.
- B. Moisten sand and thoroughly compact it with a vibratory plate compactor.

3.07 GRANULAR BASE, SUBBASE, AND SURFACING

- A. Place and Compact as specified in Standard Specifications.

3.08 REPLACING OVEREXCAVATED MATERIAL

- A. Replace excavation carried below grade lines shown or established by Engineer as follows:
 1. Beneath Footings: Granular fill.

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2. Beneath Fill or Backfill: Same material as specified for overlying fill or backfill.
3. Beneath Slabs-On-Grade: Granular fill.
4. Trenches:
 - a. Unauthorized Over excavation: Either trench stabilization material or granular pipe base material.
 - b. Authorized Over excavation: Trench stabilization material.
5. Permanent Cut Slopes (Where Overlying Area is Not to Receive Fill or Backfill):
 - a. Flat to Moderate Steep Slopes (3:1, Horizontal Run: Vertical Rise or Flatter): Earthfill.
 - b. Steep Slopes (Steeper than 3:1):
 - 1) Correct over excavation by transitioning between overcut areas and designed slope adjoining areas, provided such cutting does not extend offsite or outside easements and right-of-ways, or adversely impacts existing facilities, adjacent property, or completed Work.
 - 2) Backfilling over excavated areas is prohibited, unless in Engineer's opinion, backfill will remain stable, and over excavated material is replaced as compacted earthfill.

3.09 SUBSTATION SITE SURFACING

A. Base Course:

1. 6-inch layer.
2. Installed after Site grading and substation construction is complete.
3. Compact to at least 95 percent of maximum dry density as determined by ASTM D698, Method.

B. Finish Grade:

1. 4-inch layer.
2. Installed over base course.
3. Finish grade layer shall not be compacted.

3.10 PLACING FILL OVER GEOSYNTHETICS

A. General:

1. Place fill over geosynthetics with sufficient care so as not to damage them.
2. Place fill only by back dumping and spreading only.
3. Dump fill only on previously placed fill.
4. While operating equipment, avoid sharp turns, sudden starts or stops that could damage geosynthetics.

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- B. Hauling: Operate hauling equipment on minimum of 3 feet of covering.
- C. Spreading:
 - 1. Spreading equipment shall be track mounted low ground pressure, D-6 or lighter.
 - 2. Operate spreading equipment on minimum of 12 inches of fill over geosynthetics.
 - 3. Spread fill in same direction as unseamed overlaps to avoid separation of seams and joints.
 - 4. Never push fill downslope. Spread fill over side slopes by pushing up from slope bottom. If access to bottom of slope is unavailable, progressively place fill, beginning at toe of slope and working upslope, with backhoe or dragline operated from top of slope. Limit distance material falls onto the geosynthetics to maximum of 2 feet.
 - 5. Correct wrinkles in geotextiles
 - 6. Maintain proper overlap of unseamed geosynthetics.
 - 7. Avoid overstressing geosynthetics and seams.
- D. Compaction: Compact fill only after uniformly spread to full thickness shown.
- E. Geosynthetic Damage:
 - 1. Mark punctures, tears, or other damage to geosynthetics, so repairs may be made.
 - 2. Clear overlying fill as necessary to repair damage.
 - 3. Repairs to geosynthetics shall be made by respective installers as specified in respective specification section for each geosynthetic.

3.11 ACCESS ROAD SURFACING

- A. Place and compact as specified in Standard Specifications.

END OF SECTION

SECTION 31 25 00
EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.01 SUMMARY

A. This section Includes:

1. The temporary control measures as ordered by the County Project Manager during the life of a contract to control water pollution, soil erosion, and siltation through the use of berms, dikes, dams, sediment basins, fiber rolls, gravel, and other erosion control devices or methods. Contractor to prepare forms and implement erosion and sediment control procedures. The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

1.02 REFERENCE STANDARDS

- A. All references made within these technical provisions to the various standards shown in Section 1.2.B below shall be limited to construction materials, methods, and all work incidental to the item of work only.
- B. The following is a list of standards which may be referenced in this Sections:
 1. The California Stormwater Quality Association Handbook.

1.03 SUBMITTALS

- A. Prior to the start of construction, the Contractor shall submit schedules for accomplishment of temporary and permanent erosion control work, as are applicable for grading, construction, and paving. The Contractor shall also submit a proposed method of erosion and dust control on haul roads, and plant sites. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the County Project Manager.

1.04 QUALITY CONTROL

- A. Standard: Provide materials and construction methods complying with Section 3 "Erosion and Sediment control BMPs" of the "California Stormwater Quality Association Handbook" Fact Sheets. All BMPs are to be installed per manufacturer's installation instructions.

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1.05 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 SILT FENCE

- A. Silt Fence and related materials shall be in accordance with Section 3 "Erosion and Sediment control BMPs" of the "California Stormwater Quality Association Handbook" Fact Sheet SE-1.

2.02 FIBER ROLL

- A. Fiber Roll and related materials shall be in accordance with Section 3 "Erosion and Sediment control BMPs" of the "California Stormwater Quality Association Handbook" Fact Sheet SE-5.

2.03 STREET SWEEPING

- A. Street Sweeping shall be in accordance with Section 3 "Erosion and Sediment control BMPs" of the "California Stormwater Quality Association Handbook" Fact Sheet SE-7.

2.04 STORM DRAIN INLET PROTECTION

- A. Storm Drain Inlet Protection and related materials shall be in accordance with Section 3 "Erosion and Sediment control BMPs" of the "California Stormwater Quality Association Handbook" Fact Sheet SE-10.

2.05 STABILIZED CONSTRUCTION ENTRANCE AND EXIT

- A. Stabilized Construction Entrance and Exit shall be in accordance with Section 3 "Erosion and Sediment control BMPs" of the "California Stormwater Quality Association Handbook" Fact Sheet TC-1.

PART 3 – EXECUTION

3.01 CONSTRUCTION DETAILS

- A. The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the accepted schedule. Temporary erosion and pollution control measures will be

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used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during construction practices, but are not associated with permanent control features on the project.

- B. Where erosion is likely to be a problem, demolition should be scheduled and performed so that park improvements and permanent erosion control features can follow immediately thereafter, if the project conditions permit. Otherwise, temporary erosion control measures may be required between successive construction stages.
- C. In the event that temporary erosion and pollution control measures are required due to the Contactor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or are ordered by the County Project Manager, such work shall be performed by the Contractor at his/her own expense .
- D. The erosion control features installed by the Contractor shall be acceptably maintained by the Contactor during the construction period.

3.02 STORM WATER MANAGEMENT

- A. The Contractor shall refer to and provide storm water management in accordance with Special Conditions.

3.03 CONTRACTOR QUALITY CONTROL

- A. The Contractor shall be responsible for developing and implementing a Contractor Quality Control Program including but not limited to inspection and testing to assure compliance with the requirements of this section and in accordance with Special Conditions Section 1D-21.

3.04 FIBER ROLLS

- A. Fiber roll installation shall follow all recommendations of the San Diego County BMP Manual, as noted on the Drawings.
- B. Fiber rolls shall be installed adjacent to all construction related improvements and at the perimeter of construction fencing.
- C. Fiber roll installation shall be approved by the County Project Manager.

END OF SECTION

SECTION 32 05 23
CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS

PART 1 – GENERAL

1.01 SUMMARY

- A. Work Included: Furnish all labor, materials, equipment, tools, and necessary incidentals for the complete installation of all walkways, pavements, bands, ramps, and sport courts as shown on the drawings and as specified herein.
- B. Complete all concrete work with required finishes indicated.

1.02 SUBMITTAL

- A. Samples of color and texture shall be submitted for approval.
- B. Prepare 12" x 12" panel of each type of paving mix, materials and workmanship proposed for scope of work.

1.03 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Cement: Portland Cement Type II, conforming to ASTM C-150, maximum total alkali not to exceed 0.6%. Use single brand throughout project.
- B. Aggregates: Conform to ASTM C-33, ¾" maximum size.
- C. Sand: Fine, natural sand, well graded, conform to ASTM C-144.
- D. Expansion Joints: Conform to ASTM D-1751, size, height and location as noted on the drawings. Joints shall be impregnated felt unless otherwise specified on drawings. Provide backer bead and sealant as indicated.
- E. Water: Potable quality, clean and free of deleterious material, of neutral pH.
- F. Reinforcing Steel: #3 rebar.

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- G. Concrete Mix:
1. A 5-sack Portland cement mix, $\frac{3}{4}$ inch maximum size aggregate with maximum 4" slump, designed for 2500 psi at 28 days, unless noted otherwise.
 2. All transit ready-mixed concrete shall be mixed and delivered in accordance with the requirement of the Standard Specifications for ready-mixed concrete, ASTM C-94. Furnish batch certificates for each batch discharged.
 3. Post tension slab concrete to be Type 5 Portland Cement and shall conform to ASTM C 150.
- H. Joint Sealant: Two-part polysulfide Class A self-leveling sealant as manufactured by Thiokol, or multi-part polyurethane construction sealant by L.M. Scofield or approved equal. Color as selected by Landscape Architect.
- I. Curing Materials for Walks, Bands, and Pavements: Thompson's C & B curing and bond breaker compound, product of E. A. Thompson Co., Inc. or approved equal water sealer.
- J. Integral Color Admixture:
- K. Integral Color Pigments: ASTM C-979, natural and synthetic iron oxides and chromium oxides. Use only pure pigments without additives. Color shall be Mocha #6058 for areas replacing the decomposed granite. Submit samples.
1. Admixture as manufactured by Davis Colors (844)341-4780 or approved equal. Color shall match existing adjacent concrete, or approved by the County.
 2. Broom Finish Concrete: Broom markings on slabs shall be uniform, using a new Manila hemp bristle broom or equivalent tool. Pattern shall be as indicated on drawings or as approved. Where no color is specified, color shall be natural gray.
- L. Steel Trowel Finish Concrete: Steel trowel finish concrete bands shall be edged with a small radius edger.
- M. Expansion Joints: Install expansion joints where shown and if not shown, at 20' o.c. maximum. Install control joints at 5' o.c. or as shown on plans, and at 8' o.c. maximum in any direction.
- N. Post Tension Tendons: size and spacing per shop drawings by contractor and stamped by contractor's structural engineer.

PART 3 – EXECUTION

3.01 PROTECTION OF EXISTING FACILITIES

- A. The contractor shall protect existing facilities from damage, and discoloration from concrete splash. Adjacent concrete facilities shall be covered during concrete placement to prevent concrete splash and excess concrete from staining the adjacent concrete. After initial placement, strike-off and finishing, the protection shall be removed and the adjacent concrete cleaned.
- B. Vertical existing facilities such as light poles, walls, etc. shall be protected with plastic extending a minimum of three feet above the concrete surface. After initial placement, strike-off and finishing, the protection shall be removed and the vertical surfaces cleaned.

3.02 SUBGRADE

- A. Grade all subgrades to a uniform depth and compact to 95% minimum compaction. Moisten all subgrades prior to pouring concrete.
- B. Cut all footings in undisturbed or compacted soil. Footings shall be dead level.
- C. Place and compact sand and aggregate base as shown on drawings, per soils report and structural engineer's recommendation.
- D. Coordinate and install underground appurtenances under pavements with other work in contract and with other contractors.

3.03 FORMING

- A. Wooden forming shall be of 2" nominal thickness staked at 2' intervals. The maximum gap at the bottom of the forms shall be 1-3/4".
- B. Use only finished lumber or approved material for form work. Set all forms to conform to plans and details and as directed. All edges and lines shall be true vertical, horizontal and curved as shown on drawings.
- C. Moisten all forms prior to placing concrete.

3.04 TOLERANCES

- A. The maximum variation from design elevation shall not exceed +/- 0.02'. In some instances, particularly in critical drainage areas, tolerances may be reduced to zero. Concrete facilities shall be installed to maintain or provide positive drainage. Questions regarding applicable tolerances shall be directed to the Engineer 48 hours in advance of the work.
- B. When shown on the drawings, the concrete shall be set at the design elevations. When existing facilities are to be removed and replaced, they shall

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conform to the existing elevations and grades. Generally, this will be at a straight line.

3.05 PLACING AND FINISHING

- A. The concrete shall be deposited on a moist grade in such a manner as to require as little re-handling as possible. Workmen shall not be allowed to walk in the freshly mixed concrete with boots or shoes coated with earth or foreign substances.
- B. No Portland Cement Concrete shall be placed when the air temperature is 40°F or below.
- C. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

3.06 STRIKE-OFF, CONSOLIDATION AND FINISHING

- A. In general, adding water to the surface of the concrete to assist in finishing operations shall not be permitted.
- B. Before final finishing is completed and before the concrete has taken its initial set, the edges shall be carefully finished with the radius shown on the plans or a radius to match the existing construction.
- C. Concrete shall be thoroughly consolidated against and along the faces of all forms and adjacent concrete. After the forms are removed, excess concrete below the form surface shall be removed to be flush with the form face.
- D. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading. Screed pavement surfaces with a straightedge and strike off.
- E. Commence initial floating using bull floats or derbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Finish surfaces to true planes. Cut down high spots and fill low spots.
- F. Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations.
- G. Sidewalk shall have tooled score marks as designated on the Plans. Sawcutting of score lines is unacceptable. Should the concrete set before score lines are installed, that portion of work shall be rejected. All rejected material shall be removed to the nearest joint line and replaced at the Contractor's expense.

3.07 CONCRETE PROTECTION

- A. The Contractor shall always have materials available to protect the surface of the fresh concrete against rain. These materials shall consist of burlap, curing paper, or plastic sheeting. If plastic sheeting is used, it shall not be allowed to contact finished concrete surfaces.
- B. The Contractor shall also protect the concrete against traffic and vandalism. If the concrete is damaged or vandalized, the Contractor shall make the necessary repairs at its own expense. The repair procedure for damaged or vandalized concrete shall be approved in advance by the Engineer.

3.08 CURING

- A. Concrete shall be cured by protecting it against loss of moisture, rapid temperature change, and mechanical injury for at least three days after placement. White or clear liquid membrane compound shall be used. After finishing operations have been completed, the entire surface of the newly placed concrete shall be covered by the curing medium. The edges of the concrete exposed by the removal of forms shall be protected immediately to provide these surfaces with continuous curing treatment.
- B. The concrete shall be allowed to cure for seventy-two hours prior to placing adjacent asphalt concrete.

3.09 CONCRETE FINISHES

- A. Broom Finish: Tamp fresh concrete with heavy metal grid. Screed with a straight edge to remove all irregularities. Float to a smooth surface, steel trowel and edge to an even hard surface. Using new Manila hemp bristle broom, brush markings on slabs in uniform fashion as shown on drawings.
- B. Steel Trowel Finish: Provide hard, dense, smooth impervious surface, free of defects, by working steel trowels into top surface of concrete.

3.10 COLOR CONCRETE

- A. Prepare design mixtures, proportioned according to ACI 301, to provide normal-weight concrete with the specified properties.
- B. Add air-entraining admixture when work is performed during extreme temperature conditions at manufacturer's prescribed rate.
- C. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

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- D. Color Pigments: Add color pigments to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.
- E. Placement: Place concrete as specified.
- F. Curing: Do not use waterproof paper or plastic sheets to cover color pavement during curing. Apply a wax-based curing compound that is clear or matching colorant as pavement.
- G. Finish: After final floating, apply a hand-trowel finish followed by a broom finish using soft bristle broom, perpendicular to line of traffic, for a fine to medium texture.

3.11 SEALER

- A. Clear Acrylic Sealer: Apply uniformly in two coats in continuous operations according to manufacturer's written instructions. Allow first coat to dry before applying second coat at 90 degrees to the direction of the first coat.
- B. Begin sealing dry surface no sooner than 14 days after concrete placement.
- C. Mix slip-resistant additive thoroughly in sealer before application according to manufacturer's written instructions.

3.12 JOINTS

- A. Place control joints as shown on drawings, or at maximum 10' o.c. where not indicated.
- B. Control joints in sidewalks and bands may be made using a tooled joint, which shall extend a minimum of 1/4 of the depth of the concrete and shall not be less than 1-1/2" in depth.
- C. All joints shall be accurately aligned, of sharp, even width as shown on plans or as specified.
- D. Expansion joints shall be required at a maximum of 40' intervals on sidewalks and bands. Provide expansion joints where new work adjoins existing work, footings, foundations and other in-ground structures.

3.13 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or does not comply with requirements in this Section, in complete section from joint to joint, unless otherwise approved by County Representative.

END OF SECTION

SECTION 32 15 40
STABILIZED DECOMPOSED GRANITE

PART 1 – GENERAL

1.01 SUMMARY OF WORK

- A. Stabilized Aggregate for pedestrian walkways, firelane, driveway, and parking lot surfacing.
- B. Work Included: Furnish all materials as shown on the drawings and as specified herein and stockpile as indicated in the plans.

1.02 REFERENCES

- A. The following standards and definitions are applicable to the work of this Section to the extent referenced herein:
 - 1. ASTM: American Society for Testing and Materials.
 - 2. AASHTO: American Association of State Highway and Transportation Officials.

1.03 SUBMITTALS

- A. Product data: Submit for chemical agents. Include material safety data sheets, Environmental Protection Agency registration number, and manufacturer's instructions for handling, storing, mixing, and application.
- B. Samples
 - 1. Color and texture shall be submitted for approval.
 - 2. Construct a 12' x 24' sample of finished Stabilized Aggregate surface as directed by the Owner's Representative on site.
 - 3. Schedule mock-up construction so that mock-up can be accepted a minimum of 30 days prior to the application of paving surfaces represented by the mock-up.
 - 4. Locate mock-up panel(s) in areas as directed by the Owner's Representative.
 - 5. Continue to construct mock-ups until acceptable mock-up is produced (at no cost to the Owner). Acceptable mock-up shall be standard for texture, color and workmanship.
 - 6. Use same setting bed and joint mixes used in accepted mock-up in final work unless otherwise directed by Owner's Representative.
 - 7. Protect accepted mock-ups from damage until completion and acceptance of the work represented by the mock-up.

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- 8. Remove mock-up panel(s) from the site at completion of the project, unless otherwise instructed by Owner's Representative.
- C. Material Certificates: Signed by suppliers certifying that material complies with requirements.
- D. Sieve Analysis
- E. Maintenance Instructions: Submit copy(ies) of manufacturer's written maintenance instructions in accordance with 01 78 20 – Operation and Maintenance Data.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Installer to provide evidence to indicate successful experience in providing Stabilized Aggregate surface or ability to follow installation instructions.
- B. Mock-ups: Install 4 ft. wide x 10 ft. long mock-up of decomposed granite or 3/8" or 1/4" minus crushed aggregate surfacing with Stabilizer® additive at location specified by owner's representative.
- C. Compaction testing to be provided by contractor, one test per 2,000 square feet of base course.
- D. Manufacturer's technical representative shall visit the site at the start of an installation to ensure the installer understands the correct installation methods to use.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Acceptance at site: Provide load tickets indicating weight and conformance with submittals.
- B. Storage and protection:
 - 1. Protect delivered material from contamination by, or mixing with, other materials.
- C. Handling:
 - 1. Handle, mix, and apply chemicals in accordance with applicable regulations and manufacturer's instructions. When required, use licensed applicator.
 - 2. Store chemicals in accordance with hazardous material regulations.

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1.06 PROJECT/SITE CONDITIONS

- A. Field Measurements: Each bidder is required to visit the site of the work to verify the existing conditions. No adjustments will be made to the Contract Sum for variations in the existing conditions.
 - 1. Where surfacing is indicated to fit with other construction, verify dimensions of other construction by field measurements before proceeding with the work.
- B. Environmental Limitations: Do not install Stabilized Aggregate during rainy conditions or below 40 degrees Fahrenheit and falling.

1.07 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Submit a written warranty executed by the installer agreeing to repair or replace components of Stabilized Aggregate that fail in materials or workmanship within the specified warranty period. Stabilizer Solutions, Inc. does not warranty "Stabilizer®" purchased from a non-approved Stabilizer Solutions, Inc. licensee. Failures include, but are not limited to, the following:
 - 1. Premature wear and tear provided the material is maintained in accordance with manufacturer's written maintenance instructions.
 - 2. Failure of system to meet performance requirements.
- C. Warranty Period: Contractor shall provide warranty for performance of product. Contractor shall warranty installation of product for the time of one year from completion.
- D. Contractor shall provide, for a period of sixty days, unconditional maintenance and repairs as required

1.08 MAINTENANCE

- A. Remove debris, such as paper, grass clippings, leaves or other organic material by mechanically blowing or hand raking the surface as needed. Any plowing program required shall involve the use of a rubber baffle on the plow blade or wheels to lift blade 1/4" off of paving surface.
- B. During the first year, a minor amount of loose aggregate may appear on the surface (1/16 to 1/4"). If material exceeds a 1/4", redistribute material over

STABILIZED DECOMPOSED GRANITE

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entire surface. Water thoroughly to 1" depth and compact with power roller of no less than 1000-lbs. This process shall be repeated as needed.

- C. If cracking occurs, simply sweep fines into cracks, water thoroughly and hand tamp with an 8" to 10" hand tamp.

1.09 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Stabilizer Solutions
- B. Marloc
- C. Soil-Loc
- D. Or Equal

2.02 MATERIALS

- A. Sand and crushed stone shall consist of inert materials that are hard and durable, with stone free from surface coatings and deleterious materials.
1. The sand equivalent shall be in the range of 35-55. The R-value shall be a minimum of 71. ASTM testing shall be used for the sand equivalent and R-value determination.
 2. Dense graded crushed stone base shall be furnished and installed as required and specified to a 6" compacted depth.
 3. Gradation requirements shall be as follows:

U.S. Sieve No.	Percent Passing by Weight
# 1/2"	95 – 100
# 3/8"	90 – 100
# 4	65 – 80
# 8	48 – 63
# 16	40 – 49
# 30	30 – 40

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# 50	20 – 27
# 100	10 – 18
# 200	10 - 12

- B. Chemical control agent: Spectracide (United Industries Corporation), Roundup (Monsanto Company), or equal.
- C. Pre-emergence control agent: Pre-emergent herbicide. Fatam pre-emergent weed control (Dexol) or equal.
- D. Acceptable local supplier list to be provided by Architect
- E. Binder
 - 1. Non-toxic, organic binder that is a colorless and odorless concentrated powder that binds decomposed granite or crushed 3/8" or 1/4" minus aggregate.

PART 3 – EXECUTION

3.01 STOCKPILE

- A. Contractor shall verify exact location with County Project Manager prior to delivery and placement of materials.
- B. Size of pile(s) shall be determined by County Project Manager.

3.02 PREPARATION

- A. Surface preparation:
 - 1. Base shall be 6" compacted layer of the state's DOT recommended crushed granular road base. Make any corrections necessary to base furnished and installed to bring gravel to the elevations shown on the drawing.
 - 2. Pre-soak base material with water and compact to 95% determined by Test Method ASTM D 1557 prior to installing Stabilized Aggregate. Compaction testing to be provided by project owner, one test per 2,000 square feet of base.
 - 3. Although porous, it is recommended to have proper drainage available to ensure no standing water on surface or adjacent to Stabilized Aggregate, including downspouts when placed under roof overhang and surface drains.
 - 4. Before proceeding with installation, notify Owner's Representative in writing of unsuitable site/base conditions.

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3.03 BLENDING

- A. Binder shall be thoroughly pre-mixed per manufacturer instructions. Drop spreading of binder over pre-placed aggregate or mixing by rototilling is not acceptable for vehicular access. Stabilizer shall be mechanically pre-mixed per manufacturer's recommendations using an approved mechanical blending unit that will adequately mix and blend binder with aggregate (Bucket blending is not an approved blending apparatus).
- B. Blend binder and aggregate in dry conditions.

3.04 PLACEMENT

- A. Place the Stabilized Aggregate directly on a prepared base and rake smooth to desired grade and cross section. Place material to enough depth to allow 4" for residential or 5" for commercial after compaction. Installation of Stabilized Aggregate to be installed in lifts. If 3" thick compacted for paths (2) 1.5" lifts. If 4" thick compacted for vehicular (2) 2" lifts. If Stabilized Aggregate is pre-moistened before installation entire 3" or 4" lift may be installed. DO NOT place on filter fabric. Contact manufacturer for installation on slopes greater than 8%.

3.05 WATERING

- A. Water heavily for full-depth moisture penetration of profile. Saturate to total depth. Apply 25 to 45-gallons of water per 1-ton. Application test moisture using a probing device reaching full depth.
- B. Contractor shall wait a minimum of 6 – 72 hours or until such time that the Stabilized Aggregate is able to accept compaction from a 2 to 5 ton roller without separation, plowing or any other physical compromise of the aggregate.
- C. If surface aggregate dries significantly quicker than subsurface material, lightly mist surface before compaction.

3.06 COMPACTION

- A. Compact Stabilized Aggregate to 85% relative compaction by equipment such as; a 2 to 5-ton double drum roller making 3 to 4 passes. Do not begin compaction for 6 hours after placement and up to 72 hours. DO NOT use a vibratory plate compactor or vibration feature on roller, as vibration separates large aggregate particles. If pumping or pancaking of surface occurs, surface is still too wet to roll.
- B. Take care in compacting Stabilized Aggregate when adjacent to planting and irrigation systems. Hand tamping with 8" or 10" hand tamp recommended.

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- C. Lightly spray surface area following compaction. Do not disturb aggregate surface with spray action.

3.07 INSPECTION

- A. Finished surface shall be smooth, uniform and solid. There shall be no evidence of chipping or cracking. Cured and compacted surface shall be firm throughout profile with no spongy areas. Loose material shall not be present on the surface after installation but may appear after use and according to environmental conditions. Surface shall remain stable underneath the loose granite on top with a 'natural' look. Any significant irregularities in Stabilized Aggregate surface shall be repaired to the uniformity of entire installation.

3.08 PROTECTION

- A. Contractor shall furnish and install construction fence around new surface to prevent public access. Maintain in place for a minimum of 12 - 72 hours after installation, or as directed by the Owner' Representative.
- B. Contractor shall notify Owner's Representative to restrict landscape irrigation near surface until drying period is complete. Standing water on surface and adjacent to path shall always be restricted.

3.09 REPAIRS

- A. Excavate damaged area to the depth of the Stabilized Aggregate and square off sidewalls.
- B. If area is dry, moisten damaged portion lightly.
- C. Pre-blend the dry required amount of binder powder with the proper amount of aggregate in a concrete mixer.
- D. Add water to the pre-blended Stabilized Aggregate. Thoroughly moisten mix with 25 to 45 gallons per ton of pre-blended material or to approximately 10% moisture content.
- E. Apply moistened pre-blended Stabilized Aggregate to excavated area to finish grade.
- F. Compact with an 8" to 10" hand tamp or use a larger 1000 lb. roller. Keep traffic off areas for 12 to 48 hours after repair has been completed.

END OF SECTION

SECTION 32 17 23
PAVEMENT MARKINGS

PART 1 – GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. M237, Standard Specification for Epoxy Resin Adhesives for Bonding Traffic Markers to Hardened Portland Cement and Asphalt Concrete.
 - b. M247, Standard Specification for Glass Beads Used in Traffic Paint.
 - c. M248, Standard Specification for Ready-Mixed White and Yellow Traffic Paints.
 - d. M249, Standard Specification for White and Yellow Reflective Thermoplastic Striping Material (Solid Form).
2. ASTM International (ASTM): D4280, Standard Specification Extended Life Type, Nonplowable, Prismatic, Raised, Retroreflective Pavement Markers.
3. Federal Specifications (FS):
 - a. A-A-2886A, Paint, Traffic, Solvent Based.
 - b. TT-B-1325C, Beads (Glass Spheres); Retroreflective.

1.02 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
 - a. Product Data:
 - 1) Paint.
 - 2) Thermoplastic material.
 - 3) Reflective markers.
 - 4) Epoxies, resins, and primers to be used.
 - b. Glass Beads: Proposed gradation.
2. Samples:
 - a. Glass Beads: 2 pounds.
 - b. Portland Cement Concrete Primer: 1 quart.
 - c. Reflective marker(s).
 - d. Thermoplastic Material.

B. Informational Submittals:

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1. Description of proposed methods for removal of drips, overspray, improper markings, paint and thermoplastic material tracked by traffic, and existing markings.
2. Manufacturer's Certificate of Compliance for products specified in this section.
3. Equipment List: Proposed equipment to be used, including descriptive data.
4. Manufacturer's Instructions:
 - a. Application of preformed tape.
 - b. Application of portland cement concrete primer.
 - c. Application of glass beads.
 - d. Application of epoxy resin.
 - e. Installation of reflective markers.

1.03 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 PAINT

- A. Color: White or yellow.
- B. Traffic paint in accordance with Caltrans Standard Plans A24E, A24D, A24A, and A20D.
- C. Homogeneous, easily stirred to smooth consistency, with no hard settlement or other objectionable characteristics during storage period of 6 months.

2.02 THERMOPLASTIC MARKING

- A. Color: White or Yellow.
- B. AASHTO M249.

2.03 RAISED REFLECTIVE MARKERS

- A. Metallic or nonmetallic, or prismatic reflector type, of permanent colors retaining color and brightness under action of traffic.
- B. Rounded surfaces presenting a smooth contour to traffic.

- C. Marker in accordance with ASTM D4280.
- D. Epoxy in accordance with AASHTO M237.

PART 3 – EXECUTION

3.01 SURFACE PREPARATION

- A. Cleaning:
 - 1. Thoroughly clean surfaces to be marked before application of pavement marking material.
 - 2. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water or a combination of these methods.
 - 3. Completely remove rubber deposits, surface laitance, existing paint markings, and other coatings adhering to pavement with scrapers, wire brushes, sandblasting, approved chemicals, or mechanical abrasion.
 - 4. Scrub areas of old pavement affected with oil or grease with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application.
 - 5. Surfaces shall be completely free of dirt and ice, and dry of water at the time of application of materials specified herein.
 - 6. Oil-Soaked Areas: After cleaning, seal with cut shellac to prevent bleeding through the new paint.
 - 7. Reclean surfaces when the Work has been stopped due to rain.
 - 8. Existing Pavement Markings:
 - a. Remove existing pavement markings that may interfere or conflict with newly applied marking patterns, or that may result in a misleading or confusing traffic pattern.
 - b. Do not apply thermoplastic markings over existing preformed or thermoplastic markings.
 - c. Perform grinding, scraping, sandblasting or other operations so finished pavement surface is not damaged.
- B. Pretreatment for Early Painting: Where painting is required prior to 30 days after paving rigid pavements, pretreat with an aqueous solution containing 3 percent phosphoric acid and 2 percent zinc chloride.
- C. New Concrete Pavement:
 - 1. Allow a minimum cure time of 30 days before cleaning and marking.
 - 2. Clean by either sandblasting or water blasting to the following results:
 - a. No visible evidence of curing compound on peaks of textured concrete surface.
 - b. No heavy puddled deposits of curing compound in valleys of textured concrete surface.

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- c. Remaining curing compound is intact, with loose and flaking material completely removed.
 - d. Peaks of textured pavement surface are rounded in profile and free of sharp edges and irregularities.
 - 3. Allow a minimum drying time of 24 hours after water blasting before applying thermoplastic markings.
- D. New Asphalt Pavement: Allow a minimum pavement cure time of 30 days before applying paint.

3.02 PAINT APPLICATION

A. General:

- 1. Thoroughly mix pigment and vehicle together prior to application, and keep thoroughly agitated during application.
- 2. Do not add thinner.
- 3. Apply only when air and pavement temperatures are above 40 degrees F and less than 95 degrees F. Maintain paint temperature within these same limits.
- 4. Apply only when surface is dry.
- 5. Do not apply when conditions are windy to the point of causing overspray or fuzzy line edges.
- 6. Provide guidelines and templates to control paint application.
- 7. Take special precautions in marking numbers, letters, and symbols.
- 8. Sharply outline edges of markings and apply without running or spattering.

B. Rate of Application:

- 1. Reflective Markings: Apply evenly, 105 plus or minus 5 square feet per gallon.
- 2. Glass Bead Application:
 - a. Apply immediately following application of paint.
 - b. Use evenly distributed drop-on application method.
 - c. Rate: 6 pounds per gallon of paint.
- 3. Nonreflective Markings: Apply paint evenly to pavement surface at a rate of 105 plus or minus 5 square feet per gallon.
- 4. On new pavement or new asphalt surface treatments, apply two coats of paint at a uniform rate of 210 square feet per gallon.

C. Drying:

- 1. Provide maximum drying time to prevent undue softening of bitumen and pickup, displacement, or discoloration by traffic.
- 2. If drying is abnormally slow, discontinue painting operations until cause is determined and corrected.

- D. Protection:
 - 1. Protect markings from traffic until paint is thoroughly dry.
 - 2. Protect surfaces from disfiguration by paint spatters, splashes, spills, or drips.
- E. Cleanup: Remove paint spatters, splashes, spills, or drips from the Work and staging areas including areas outside the immediate Work area where spills occur.

3.03 THERMOPLASTIC MARKING APPLICATION

- A. Following specified surface preparation, prime and apply marking and glass beads to provide a reflectorized strip as shown on Drawings.
- B. Application Temperatures:
 - 1. Pavement Surface: Minimum 40 degrees F and rising.
 - 2. Thermoplastic: Minimum 375 degrees F, maximum 425 degrees F.
- C. Primer:
 - 1. On portland cement concrete and existing asphalt pavements, apply epoxy resin primer/sealer according to thermoplastic manufacturer's recommendations.
 - 2. All primer/sealer to dry prior to applying thermoplastic.
- D. Thermoplastic Marking:
 - 1. Extrude or spray in a molten state, free of dirt or tint at a minimum thickness of 0.125 inch; maximum thickness of 0.190 inch.
 - 2. Apply centerline, skipline, edgeline, and other longitudinal type markings with a mobile applicator.
 - 3. Apply special markings, crosswalks, stop bars, legends, arrows, and similar patterns with a portable, extrusion-type applicator.
- E. Glass Bead Application:
 - 1. Immediately after marker application, mechanically apply such that the beads are held by and imbedded in the surface of the molten material.
 - 2. Application Rate: 1 pound per 20 square feet of compound.
- F. Cool completed marking to ambient temperature prior to allowing vehicular traffic.

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3.04 INSTALLATION OF RAISED REFLECTIVE MARKERS

- A. Apply epoxy to cleaned and prepared pavement area per manufacturer's instructions.
- B. Apply marker to epoxy before epoxy has a chance to set.
- C. Align markers carefully, projecting no more than 3/4 inch above level of pavement.
- D. Spacing:
 - 1. Solid Longitudinal Lines: As shown in Drawings.
 - 2. Broken Centerlines: As shown in Drawings.

END OF SECTION

**SECTION 32 33 00
SITE FURNISHINGS**

PART 1 – GENERAL

1.01 SUMMARY

- A. Work Included: Provide all material, labor, equipment and services necessary for the furnishing and installation of all site furniture and site equipment items, as shown on the drawings and as specified below. The work includes, but is not limited to:
 - 1. Concrete Picnic Tables
 - 2. Concrete Trash/Recycle Bins

1.02 ACCEPTANCE

- A. Prior to the purchase of the items, the Contractor shall supply the Landscape Architect with vendor information, photos and samples of the finishes for approval. No materials for this section shall be purchased until such approval is granted.

1.03 CERTIFICATION

- A. Delivery schedules shall be verified and certified in writing to the Landscape Architect within 10 days after project commences.

1.04 QUALITY ASSURANCE

- A. Workmanship and Materials: All workmanship and materials within this Section shall conform strictly to the manufacturer's specifications installation instructions and guarantees.

1.05 SUBMITTALS

- A. General: Submittals to be in accordance with the requirements of the Standard Specifications. Review or acceptance, as specified, by the Landscape Architect is required prior to commencement of work.
- B. Catalog Cuts: Submit for each pre-manufactured item.
- C. Shop Drawings: Submit shop drawings when required in the list of items below.

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1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Site furnishings and equipment shall be delivered and unloaded at job site in such a manner that no damage occurs to the product during hauling, handling or unloading, storage and installation.

1.07 SUBSTITUTIONS, ADDITIONS AND DELETIONS

- A. Submit proposals for substitutions in writing to the Landscape Architect. Acceptance by the Landscape Architect is required prior to proceeding with the work under this Section.

1.08 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 GENERAL

- A. All site furniture and site equipment items shall be as indicated on the drawings.

2.02 PRODUCTS

- A. Concrete Picnic Tables (8' Long):
- B. Concrete Trash/Recycle Bins
 - 1. Quick Crete Products – P.O. Box 639, 731 Parkridge Avenue, Norco, CA
Quickcrete.com
 - 2. Dura Art Stone – 11010 Live Oak Avenue, Fontana, CA 92337
(626) 577-6000
Duraartstone.com
 - 3. San Diego Precast Concrete – 9702 Prospect Avenue, Santee, CA 92071
(619)449-6810

PART 3 – CONSTRUCTION

3.01 LAYOUT OF SITE FURNISHINGS/EQUIPMENT

- A. Layout site furniture according to the locations shown on the drawings, and as required by the Project Manager
- B. Set site furnishings level and true to line, in correct relationship to adjacent materials and structures.
- C. Secure site furnishings permanently in place to prevent removal or tampering.
- D. Adjustments: The Project Manager reserves the right to make adjustments in the locations of the site furniture without additional cost to the Contractor.
- E. Install per manufacturer's specifications.
- F. Quantity of furnishings shall be as specified on plans.

3.02 PROTECTION

- A. Protect installed site furniture, if required, during the construction period to prevent damage and wear.

3.03 REPLACEMENT

- A. Replace all defective or damaged site furniture prior to Final Acceptance.

END OF SECTION

SECTION 32 84 00
IRRIGATION SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Piping.
2. Backflow preventers.
3. Pressure reducing valves.
4. Manual valves.
5. Automatic control valves.
6. Transition fittings.
7. Sprinklers.
8. Subsurface drip irrigation systems
9. Deep watering devices
10. Quick couplers.
11. Controllers.
12. Miscellaneous.
13. Boxes for irrigation equipment.

1.02 RELATED WORK:

1. Contract Drawings

1.03 REFERENCES

- A. Standard Specifications for Public Works Construction “Greenbook”, 2018 Edition.
- B. County of San Diego Water Efficient Landscape Design Manual (WELDM).
- C. San Diego Regional Standard Drawings, Latest Edition.
- D. San Diego Water Agency Standards (SDWAS), Latest Edition.

1.04 DEFINITIONS

- A. Circuit/Lateral Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.
- B. Main/Mainline Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

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- C. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

1.05 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Record Drawings: Provide full sized record drawings of new irrigation mainline, valves and quick couplers dimensioned in two directions from fixed objects such as sidewalks, curbs, light poles and fire hydrants. Provide, to the satisfaction of the Owner, two sets of half scale color controller charts with each valve control zone identified with a unique color and the matching valve ID box colored the same. Charts shall be laminated and sealed in plastic. Deliver all to the Owner.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers that include a certified irrigation installer qualified by the California Landscape Contractors Association.
- B. Controller Certification: Prior to commencement of the maintenance period, Contractor shall contact the irrigation controller manufacturer and request an inspection and certification of the controller and communication system for proper operation, programming and remote web access for programming and monitoring.
- C. Guarantee: Contractor shall furnish a written guarantee in accordance with the general conditions for a period of one (1) year from the date of final acceptance and conclusion of the maintenance period. Guarantee shall cover the complete Contractor installed portion of the irrigation system, including defective materials or workmanship, settling of the backfill in trenches and repairs and/or replacement of any material damaged thereby or there from.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.08 PROJECT CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 - 1. Notify Owner no fewer than three days in advance of proposed interruption of water service.
 - 2. Do not proceed with interruption of water service without Owner's written permission.

1.09 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 DESIGN CRITERIA

- A. Work shall comply with applicable potable water irrigation standards. All work, materials, and installation shall conform to the codes, requirements and details of Lakeside Water District and the WELDM.
- B. Irrigation zone control shall be automatic operation with new automatic control valves and new controller.
- C. Location of Sprinklers and Specialties: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as fence posts, signs and light standards. Maintain 100 percent irrigation coverage of all new irrigation areas.
- D. D. Irrigation Boxes and Controller – Prior to irrigation trench excavation, stake proposed locations for all irrigation boxes and the controller for approval by the Inspector or Landscape Architect.
- E. E. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:
 - a. Irrigation Main Piping: 200 psig
 - b. Circuit Piping 150 psig

2.02 PIPES, TUBES, AND FITTINGS

1. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes. All pipe materials shall be in accordance with Lakeside Water District standards.
2. BRASS/BRONZE PIPE, NIPPLES, FITTINGS AND APPURTENANCES: Brass pipe, nipples and fittings shall conform to ASTM B 43, regular wall thickness. Threads shall conform to ANSI B1.20.1. All bronze appurtenances specified herein shall conform to ASTM B 62.
3. PVC Pipe: ASTM D 1785, PVC 1120 compound, Schedule 40.
 - a. PVC Socket Fittings: ASTM D 2466, Schedules 40 for circuit (non-pressure) piping and 80 for main (pressure) piping.
 - b. PVC Threaded Fittings: ASTM D 2464, Schedule 80.
 - c. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.

2.03 PIPING JOINING MATERIALS

1. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
2. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

2.04 BACKFLOW PREVENTERS

A. Reduced Pressure Principle Backflow Preventers:

1. Manufacturers: Per the plans, or equal, subject to compliance with requirements and approval of Lakeside Water District, provide products by one of the following:
 - a. Febco.
 - b. Hammond.
 - c. Watts.
 - d. Zurn.
2. Description:
 - a. Standard: ASSE 1013, SDWAS Standard Specification Section 15112, and SDWAS Approved Materials List.
 - b. Body Material: Brass, lead-free.
 - c. Pressure Rating: Hydrostatic test pressure of 350 psi, working pressure of 175 psi.
 - d. End Connections: Threaded
3. Capabilities and Characteristics
 - a. Size: As indicated on the plans.
 - b. Design Flow Rate: As indicated on the plans.

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- c. Design Inlet Pressure: As indicated on the plans.
- d. Design Outlet Pressure Setting: As indicated on the plans.

2.05 PRESSURE-REDUCING VALVES

A. Water Regulators:

- 1. Manufacturers Per the plans, or equal, subject to compliance with requirements, provide products by one of the following:
 - a. Febco.
 - b. Wilkins.
 - c. Watts.
 - d. Zurn.
- 2. Description:
 - a. Standard: ASSE 1003.
 - b. Body Material: Lead-free bronze.
 - c. Pressure Rating: Initial pressure of 300 psig.
 - d. End Connections: Double union FMPT threaded.
 - e. Options: 10 psig to 125 psig spring range.

B. Capacities and Characteristics:

- a. Size: As indicated on the plans.
- b. Design Flow Rate: As indicated on the plans.
- c. Design Inlet Pressure: As indicated on the plans.

2.06 MANUAL VALVES

A. Bronze Globe Valves:

- 1. Manufacturers: Per the plans, or equal, subject to compliance with requirements, provide products by one of the following:
 - a. Febco.
 - b. Apollo.
 - c. Powell.
- 2. Description:
 - a. CWP Rating: 200 psig. Min.
 - b. Body Design: Globe.
 - c. Body Material: Bronze or brass.
 - d. Ends: Threaded.
 - e. Stem: Bronze or stainless steel.
 - f. Warranty: Two-year.

2.07 AUTOMATIC CONTROL VALVES

A. Brass, Automatic Control Valves: As indicated on the Drawings

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- B. Identification: Provide for each control valve a yellow 3-inch by 4-inch, valve identification tags as manufactured by T. Christy Enterprises

2.08 TRANSITION FITTINGS

- A. General Requirements: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined
- B. Plastic-to-Metal Transition Fittings
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:
 - a. LASCO Fittings, Inc.
 - b. NIBCO INC.
 - c. Spears Manufacturing Company.
 - 2. Description: PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-socket or threaded end.
- C. Plastic-to-Metal Transition Unions:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. LASCO Fittings, Inc.
 - b. NIBCO INC.
 - c. Spears Manufacturing Company.
- D. Description: MSS SP-107, PVC four-part union. Include one brass or stainless-steel threaded end, one solvent-cement-joint or threaded plastic end, rubber O-ring, and union nut.

2.09 SPRINKLERS

- A. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.
- B. Plastic, Pop-up Spray Sprinklers and Rotators:
 - 1. As indicated on the Drawings.
 - 2. Description:
 - a. Body Material: Plastic.
 - b. Nozzle: Plastic.
 - c. Pop-up Riser: Plastic, 12-inch.
 - d. Retraction Spring: Stainless steel.
 - e. Internal Parts: Corrosion resistant.
 - f. Inlet: 1/2-inch NPS.

2.10 DEEP WATERING DEVICES

- A. General Requirements: Designed for deep watering of trees indicated at available water pressure.
- B. Deep Watering Devices – As indicated on the plans.
- C. Identification: All deep watering device grates shall be standard potable water model.

2.11 QUICK COUPLERS

- A. As indicated on the Drawings.
- B. Description: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.
 - 1. Locking-Top Option: Provide potable water, yellow colored, vandal-resistant locking feature. Include two matching key(s).

2.12 CONTROLLERS

- A. As indicated on the Drawings.
- B. Description: As indicated on the Drawings.
 - 1. Factory-mounted in a heavy-duty, stainless steel wall, flip-top lid enclosure to be located as indicated on the drawings and approved by the County Project Manager.
 - 2. Provide and install a hard-wired rain sensor on the roof eave as indicated on the Drawings. Sensor wire shall be in Schedule 40 PVC conduit with sweeps to the controller.
 - 3. Provide 5-year communication and data plan for web-based monitoring and programming.
 - 4. Provide a brass flow sensor as indicated on the Drawings.
 - 5. Provide grounding as indicated on the Drawings and as recommended by the manufacturer.

2.13 MISCELLANEOUS

- A. Control Wires
 - 1. Wiring: UL 493 and 83, ASTM B-3 and B-8, Type UF THW, 600 volt rated, single solid-copper conductors; PVC insulation; suitable for direct burial. All control wires shall be in conduit from controller to valve.

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- a. Feeder-Circuit Cables: No. 12 AWG minimum, between building and controllers.
 - b. Low Voltage, Common Circuit Cables: No. 12 AWG minimum, white colored jacket.
 - c. Low-Voltage, Branch-Circuit Cables: No. 14 AWG minimum, black color jacket for circuit wires and red color jacket for spare wires, between controllers and automatic control valves.
 - d. Wire Splicing Materials: Manufacturer's packaged kit consisting of insulating, spring-type connector or crimped joint and epoxy resin moisture seal; suitable for direct burial.
 - e. Conduit: ASTM D 1785, PVC 1120 compound, Schedule 40 pipe and fittings, including sweep ells.
- B. Detectable Warning Tape: Constant pressure potable water lines shall be marked with 3" wide, warning/identification (non-ferrous) marking tape for buried irrigation, blue color with continuous warning "CAUTION WATER MAIN BURIED BELOW." T. Christy or approved equal.
- C. Valve ID Tags: Weather-proof plastic, 3" x 4", yellow in color, with permanently imprinted in black the valve identification number on the back. T. Christy or approved equal.
- D. Swing joint assemblies: As indicated on the Drawings.
- E. Check Valves: All sprinkler heads, bubblers and deep watering devices shall have factory installed check valves. Provide and install additional in-line check valves in an 8-inch diameter valve box, where necessary to prevent low head drainage.

2.14 BOXES FOR IRRIGATION EQUIPMENT

- A. Equipment Boxes:
- 1. For housing master valve, flow sensor, control valves, quick coupling valves, isolation globe valves and control wire pull boxes.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Old Castle.
 - b. Brooks.
 - c. Christy.
 - d. Carson.
 - e. J&R.
 - 3. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.
 - a. Size: As required for valves and service, minimum 12-inches by 18-inches.

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- b. Shape: Rectangular.
 - c. Sidewall Material: Precast concrete, pedestrian rated.
 - d. Cover Material: Cast iron, stainless steel lock and cast "IRRIGATION" lettering.
- B. Gravel: Washed gravel or crushed stone, 1/2-inch in size.
- C. Identification: "IRRIGATION" Factory lettering and painted valve identification.
- D. Gopher Netting: welded wire hardware fabric, 23 AWG wire, #4 mesh, galvanized finish for all irrigation boxes.

PART 3 – EXECUTION

3.01 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earthwork and Grading."
- B. Install warning tape directly above mainline pressure piping, as indicated on the plans.
- C. Provide minimum cover over top of underground piping as indicated on the plans.

3.02 PIPING INSTALLATION

- A. Set stakes to identify locations of proposed irrigation system. Obtain Landscape Inspector and Landscape Architect's approval before excavation.
- B. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved by Owner.
- C. Install piping free of sags and bends.
- D. Install groups of pipes parallel to each other, spaced to permit valve servicing.
- E. Install fittings for changes in direction and branch connections.
- F. Install unions adjacent to valves as indicated on the plans.
- G. Lay piping on solid subbase, uniformly sloped without humps or depressions.
- H. Install PVC piping in dry weather when temperature is above 40 deg . Allow joints to cure at least 24 hours at temperatures above 40 deg F before testing.
- I. Install piping in sleeves under parking lots, roadways, and sidewalks.

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- J. Install sleeves made of Schedule 40 PVC pipe and socket fittings, and solvent-cemented joints.
- K. Install transition fittings for plastic-to-metal pipe connections.

3.03 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints: Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are damaged. Do not use pipe sections that are cracked.
- D. Copper-Tubing Soldered Joints: Apply ASTM B 813 water-flushable flux to tube end unless otherwise indicated. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy (0.20 percent maximum lead content) complying with ASTM B 32.
- E. PVC Piping PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings using primer and cement according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. PVC Pressure Piping: Join schedule number, ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
 - 3. PVC Non-pressure Piping: Join according to ASTM D 2855.

3.04 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION

- A. Equipment Mounting: Install controllers per the Manufacturer's instructions and as indicated on the Drawings.
 - 1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.

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3. Install grounding, power and control wire sweeps as indicated on the Drawings.
4. Pour concrete pad as indicated on the Drawings
5. Mount enclosure and controller per Manufacturer's instructions and details.
6. Connect power, control and grounding wiring per the Manufacturer's instructions and details.

B. Control Wires: Install control wires in conduit as indicated on the Drawings.

1. Provide two spare wires from the controller to each mainline leg.

3.05 VALVE INSTALLATION

A. Globe Valves: As indicated on the Drawings.

B. Automatic Control Valves: As indicated on the Drawings.

3.06 SPRINKLER INSTALLATION

A. Install sprinklers after hydrostatic test and system flush is completed.

B. Locate and install sprinklers as indicated on the Drawings.

3.07 DEEP WATERING DEVICE INSTALLATION

A. Install deep watering devices after hydrostatic test and system flush is completed.

B. Install deep watering devices as indicated on the plans.

3.08 CONNECTIONS

A. Comply with Lakeside Water District requirements for water supply from irrigation water meters and backflow preventers. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.

C. Connect wiring between controller and automatic control valves.

D. Connect wiring between flow sensor and controller.

E. Connect wiring between controller and master valve.

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3.09 IDENTIFICATION

- A. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over constant pressure underground piping during backfilling of trenches as indicated on the Drawings.

3.10 CLEANING

- A. Flush dirt and debris from piping before installing valves, sprinklers, filters, and other devices.

3.11 FIELD QUALITY CONTROL

- A. Tests and Inspections: All tests and inspections shall be observed by the Owner's Representative or the Landscape Architect. Provide a minimum of three working days' notice for tests and inspections.
 - 1. Sleeve and trenching certifications.
 - 2. Mainline Pressure Test: All mainlines in the system, and lateral lines under paving, shall be capped and pressure tested at 125 psig for a period of four hours. Any leaks found shall be corrected and the mainlines retested until there are no leaks.
 - 3. Lateral Line Pressure Test: All laterals shall be pressure tested at design pressure for one hour.
 - 4. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
 - 5. Coverage Test: Operate irrigation system to ensure head to head coverage. Contractor shall adjust all heads and drip lines as necessary to provide head to head coverage, and to keep irrigation water off walls, walks, buildings, driveways or other areas not scheduled to receive irrigation. The Contractor shall provide all materials and perform all work required to correct any inadequacies or coverage at his own cost.
 - 6. The Contractor shall not allow nor cause any of his work to be covered until it has been inspected, tested and approved by the Owner's Representative or the Landscape Architect.
- B. Any irrigation product will be considered defective if it does not pass tests and inspections.

3.12 STARTUP SERVICE

- A. Coordinate with the automatic controller manufacturer's representative.
 - 1. Complete installation and startup check according to manufacturer's written instructions.

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2. Verify that controllers are installed and connected according to the Contract Documents.
3. Verify that electrical wiring and grounding installation complies with code and the manufacturer's submittal.
4. Verify that the controller is fully functional with the Manufacturer's web based central control system.
5. Program the controller per the establishment phase program as indicated on the Drawings. This schedule is based upon average climate conditions and is only a starting point. Adjust the schedule as necessary during the maintenance period to provide water in an effective and efficient manner as required by the plants.
6. Obtain inspection and certification of installation, grounding and operation from the manufacturer's field representative.

3.13 ADJUSTING

- A. Adjust settings of controllers.
- B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.
- C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with, or not more than 1/4 inch above finish grade.
- D. Adjust sprinkler arc and radius to prevent overspray onto buildings, drives, structures or pavements.
- E. Adjust pressure regulating valve to the lowest pressure while allowing optimal performance of the largest and farthest system.
- F. Adjust the irrigation schedule as necessary during the maintenance period to provide water in an effective and efficient manner as required by the plants.

END OF SECTION

SECTION 32 93 00
PLANTS

PART 1 – GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
 2. Standard Specifications for Public Works Construction, 2015 Edition.
 3. County of San Diego Water Efficient Landscape Design Manual, Latest Edition.
 4. San Diego Regional Standard Drawings, Latest Edition.
 5. ANSI Z60.1: American Standard for Nursery Stock, Latest Edition.

1.02 SUMMARY

- A. Section Includes:
1. Plants
 2. Planting soils.
 3. Tree stabilization.
- B. Related Services
1. Division 32 Section “Irrigation”

1.03 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.
- C. Finish Grade: Elevation of finished surface of planting soil.
- D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes

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substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

- E. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- F. Planting Area: Areas to be planted.
- G. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- H. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
- I. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
- J. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.
- K. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- L. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.
- M. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.04 SUBMITTALS

- A. Product Data: For each type of product indicated, including soils.
 - 1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
 - 2. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to the Project.

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3. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to the Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph for scale. For species where more than 50 plants are required, include a minimum of 3 photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.
 4. Organic Mulch: Manufacturer's product data sheet indicating source of material and particle size.
 5. Organic Amendment: Manufacturer's product data sheet indicating pH, salinity, as received/dry bulk density, moisture content, total nitrogen, organic percentage dry weight, organic matter in pounds per cubic yard, particle sizes, half saturation percentage, dilute acid extractable iron and estimated carbon to nitrogen ratio.
 6. Decorative Boulders: Include color photographs in digital format of boulders, three photographs for each of the three sizes of boulders. Each photograph shall be of a different boulder sample, not a different view of the same boulder.
 7. Miscellaneous Materials: Root control barrier, drainpipe and weed control barrier.
- B. Samples for Verification: For each of the following:
1. Organic Mulch: 1-quart volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup
 2. Cobble and Gravel Mulch: 1-gallon volume of each mulch required, in sealed plastic bags labeled with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on the site; provide an accurate indication of color, texture, and makeup of the material.
 3. Weed Control Barrier: 12 by 12 inches.
- C. Soil Composition Tests: Provide commercial test and soil amendment recommendations from an independent testing laboratory. Testing shall include basic soil classification groups, moisture and saturation percentages, Nitrogen-Phosphorus-Potassium (N-P-K) ratio, pH (ASTM D 4972), soil salinity, secondary nutrient groups (calcium, magnesium, sodium) Sodium Absorption Ratio (SAR), micronutrients (zinc, manganese, iron, copper) toxic soil elements (boron, chloride, sulfate) cation exchange and base saturation percentages, and soil amendment and fertilizer recommendations with quantities for plant material being transplanted. Soil required for each test

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shall include a maximum depth of 18 inches of approximately 1 quart volume for each test (verify with laboratory prior to sampling). Provide one sample for each acre of site area or portion thereof. Samples shall contain at least 6-8 cores for each sample area and be thoroughly mixed. Problem areas should be sampled separately and compared with samples taken from adjacent non-problem areas. The location of the sample areas should be noted and marked on a parcel or planting map for future reference.

- D. Field Percolation Test: Immediately following rough grading operation, identify a typical location for one of the largest trees and shrubs and excavate one pit each per the project details. In the presence of the Landscape Architect and/or the Owner's Representative, fill the pit with water to a depth of 12 inches. Within six hours of the time the water has drained from the pit, the Contractor, with the Owner's Representative and project Landscape Architect present, shall again fill the pit with water to a depth of 12 inches. The length of time required for the water to percolate into the soil, leaving the pit empty, shall be measured and recorded in the presence of the Owner's Representative on an hourly basis over a 12-hour period and submitted to the project Landscape Architect. If the water does not completely percolate into the soil within 9 hours, a determination shall be made by the Landscape Architect as to whether a supplemental drainage system will be designed for trees and a soil penetrant will be required for each shrub being planted.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.
1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 2. Personnel Certifications: Certified Landscape Technician - Exterior, with installation, maintenance and irrigation specialty area(s), designated CLT-Exterior.
 3. Pesticide Applicator: State licensed, commercial.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed. Acceptable laboratories are:
1. Waypoint Analytical, Phone (714) 282-8777, Email support@waypointanalytical.com; Test A05-2.
 2. Wallace Laboratories, Phone (310) 615-0116, Email info@wllabs.com; Test: Agronomic Soil Suitability Test.

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3. Perry Laboratory, Phone (831) 722-7606; Email info@perrylaboratory.com; Test H-1-R.
- C. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
- D. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
 1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field- grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
 2. Other Plants: Measure with stems, petioles, and foliage in their normal position.
- E. Plant Material Observation: Landscape Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Notify Landscape Architect of sources of planting materials seven days in advance of delivery to site. Landscape Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
- F. Pre-Installation Conference: Conduct conference at Project site.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Cover plants during shipment with a tarpaulin or other suitable covering to minimize drying.
- C. Bulk Materials:
 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.

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2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 3. Accompany each delivery of bulk fertilizers, gypsum and soil amendments with appropriate certificates.
- D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
- E. Handle planting stock by root ball.
- F. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
1. Do not remove container-grown stock from containers before time of planting.
 2. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.
- G. Cover plants during shipment with a tarpaulin or other suitable covering to minimize drying.

1.07 PROJECT CONDITIONS

- A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.
- B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:
1. Notify Owner no fewer than two days in advance of proposed interruption of each service or utility.
 2. Do not proceed with interruption of services or utilities without Owner's written permission.

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- C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.08 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
 - b. Structural failures including plantings falling or blowing over.
 - c. Faulty performance of tree stabilization.
 - 2. Warranty Periods from Date of final acceptance by the Owner:
 - a. Trees: 365 days.
 - b. Shrubs, Vines, Perennials and other plants: 120 days.
 - 3. Include the following remedial actions as a minimum:
 - a. Immediately remove dead plants and replace.
 - b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
 - c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
 - d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

1.09 MAINTENANCE/ESTABLISHMENT PERIOD

- A. Initial Maintenance/Establishment Period for Trees, Shrubs and Ground Covers: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3 Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.
 - 1. Maintenance Period: Minimum 90 days from date of Substantial Completion until acceptance by the Owner.

1.10 SCHEDULING AND SEQUENCING

- A. Plant Deliveries: Notify Engineer at least 1 day in advance of each delivery.

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- B. Planting Season: Conduct planting during times of year that are normal for such work as determined by accepted local practice.
- C. Plant trees and shrubs after final grades are established and before planting of lawns or grasses.

1.11 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 PLANT MATERIALS

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
 - 1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots will be rejected.
 - 2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.
- B. Provide quantity, size, genus, species, and variety of trees and shrubs indicated; comply with applicable requirements of ANSI Z60.1.
- C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- D. Plants shall not be root bound in their containers nor have roots that are not adequately developed for their container size.
- E. Label each plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific

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name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on Drawings.

- F. If formal arrangements or consecutive order of plants is shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

2.02 INORGANIC SOIL AMENDMENTS

- A. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.
- B. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- C. Aluminum Sulfate: Commercial grade, unadulterated.
- D. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 sieve.

2.03 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter, moisture content 35 to 55 percent by weight; 100 percent passing through 3/8-inch sieve; soluble salt content of <4 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
 - 1. Organic Matter Content: Minimum 50 percent of dry weight.
 - 2. Carbon to Nitrogen Ratio: 35:1 or lower.
 - 3. pH: Between 6 and 8.
 - 4. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

2.04 FERTILIZERS

- A. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
- C. Planting Tablets: Tightly compressed chip type, long-lasting, slow-release, commercial- grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

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1. Size: 5-gram and 21-gram tablets.
 2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.
- D. Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial-grade FeDTPA for ornamental grasses and monocots.

2.05 PESTISIDES

- A. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. All pesticides used near natural water courses or man-made storm water bioswales shall be water safe, non-toxic to aquatic life and use a non-ionic surfactant.
- C. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- D. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.06 HERBICIDE

- A. Selective, pre-emergent, surface-applied for non-hydroseeded areas.
- B. Manufacturers and Products:
1. Eli Lilly and Co.; Surflan.
 2. Thompson-Hayward Chemical Co.; Casoron.

2.07 PLANTING SOILS

- A. Planting Soil for Plants Installed 24 Inches or Less On-Center: Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with the soil amendments by tilling to a minimum depth of six inches as recommended in the Soil Composition Test report.
- B. Plant Backfill Mix: Modify existing, in-place surface soil as recommended in the Soil Composition Test report.

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2.08 GUYING, STAKING, AND WRAPPING MATERIALS

- A. Wood Stake: 2 inches by 2 inches by 10 feet. Upright stakes as indicated on the plans.
- B. Tree Ties: 32-inch long UV resistant vinyl tree support tie as indicated on the plans.

2.09 MISCELLANEOUS PRODUCTS

- A. Root Barrier: DeepRoot Model UB-24-2root barrier by DeepRoot, Phone (415) 781-9700, Email info@deeproot.com.
- B. Tree Drainage Pipe: PVC ASTM D2729 solvent weld drainpipe, 3-inch diameter, solid and perforated. Install filter fabric sleeve on perforated pipe sections.
- C. Filter Fabric: Mirafi 140N needle-punched, nonwoven Geotextile fabric.

2.10 HYDROSEEDING MATERIALS – RETENTION BASINS

- A. Mulch: Conwed Fibers Hydro Mulch 1000.
- B. Fertilizer: 16-16-16
- C. Binder: Ecology Controls M-Binder

2.11 WEED-CONTROL BARRIERS

- A. Nonwoven Geotextile Filter Fabric: Mirafi Mscape needle-punched, nonwoven

2.12 ROCK MULCH.

- A. Free from noxious weed seed and foreign material harmful to plant growth.
- B. Stone Mulch:
 - 1. Round river rock, washed, with no fines.
 - 2. Stone Size: Minimum 1 inch maximum 5 inches.
 - 3. As indicated on the plans.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.
 - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

3.02 LOCATION OF PLANTS

- A. Locate new planting or stake positions as shown, unless obstructions are encountered, in which case notify Engineer.
- B. Locate no planting, except ground cover, closer than 18 inches to pavements, pedestrian pathways, and structures.
- C. Request Engineer observe locations and adjust as necessary before planting begins.

3.03 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

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- C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.
- D. Subsoil Drainage: Furnish plant pits and beds after percolation test results are received.
- E. Planting Soil: Delay mixing of amendments and fertilizer if planting will not follow preparation of planting soil within 2 days. For pit and trench type backfill, mix planting soil prior to backfilling and stockpile at Site.

3.04 PLANTING AREA PREPARATION

- A. For non-retention basin planting areas, loosen soil of planting areas to a minimum depth of 8 inches by ripping and tilling in two directions. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- B. For plantings 24 inches on center or less, apply soil amendments as recommended in the Soil Composition Test report directly to grade before loosening. Delay mixing fertilizer with planting soil if planting will not proceed within two days.
- C. Finish Grading: Grade planting areas in accordance with the project grading plan to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.
- D. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.05 EXCAVATION FOR TREES AND SHRUBS

- A. Planting Pits and Trenches: Excavate planting pits as indicated on the drawings. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
- B. Subsoil and topsoil removed from excavations may be used as planting soil unless otherwise directed by the Landscape Architect or Owner's Representative.
- C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations. Hardpan Layer:

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Drill 6-inch- diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.

- D. Based upon the result of the mandatory Percolation Test, the Landscape Architect will determine a piped tree well drainage system is required. Also notify the Owner and Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.
- E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.06 TREE, SHRUB, AND VINE PLANTING

- A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- C. Scarify plant root ball sides and bottom, tree root balls a minimum of 1-inch deep and shrub root balls a minimum of 1/2-inch deep. Loosen circling or matted roots.
- D. Set container-grown stock plumb and in center of planting pit or trench as indicated on the drawings.
- E. Use planting soil for backfill and add fertilizer tablets per the schedule below when backfill is installed to half the root ball depth.
 - 1. 1 Gallon: 1 21 gram tablet.
 - 2. 5 Gallon: 3 21 gram tablets.
 - 3. 15 Gallon: 4 21 gram tablets.
 - 4. Boxed Trees: 1 21 gram tablet per each 4 inches of box size.
- F. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- G. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- H. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.07 TREE STABILIZATION

- A. Install trunk stabilization as follows unless otherwise indicated:
 - 1. Upright Staking and Tying: Stake trees as indicated on the Drawings.

3.08 ROOT-BARRIER INSTALLATION

- A. Install root barrier where and as indicated on the Drawings.
- B. Align root barrier vertically and run it linearly along and adjacent to the paving or other hardscape elements to be protected from invasive roots.
- C. Install root barrier continuously for a distance of 10 feet in each direction from the tree trunk, for a total distance of 20 feet per tree. If trees are spaced closer, use a single continuous piece of root barrier.
 - 1. Position top of root barrier per manufacturer's recommendations.
 - 2. Do not install root barrier surrounding the root ball of tree.

3.09 GROUND COVER AND PLANT PLANTING

- A. Amend and till the soil as noted above for all plantings spaced 24 inches on center or less.
- B. Set out and space ground cover shrubs and plants as indicated on the drawings in even rows with triangular spacing.
- C. Dig holes large enough to allow spreading of roots.
- D. Use planting soil for backfill and add fertilizer tablets when backfill is installed to half the root ball depth. Install one 5 gram tablet per flatted or liner plant.
- E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.10 HYDROSEEDING – RETENTION BASINS

- A. Hydroseeding: Mix specified seed mix per the plans and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
 - 1. Mix slurry with tackifier.
 - 2. Spray-apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch and seed components are deposited at not less than the specified seed-sowing rate.
 - 3. Protect hydroseeded area until establishment.
 - 4. Areas with less than 80 percent germination at 90 days will be reseeded to the satisfaction of the Owner's Representative.

3.11 PLANTING AREA MULCHING

- A. Install weed-control barriers according to manufacturer's written instructions before mulching areas to receive inorganic cobble and gravel mulch. Do not install weed control barriers in areas to receive organic mulch. Completely cover area to be mulched, overlapping edges a minimum of 12 inches and secure seams with galvanized pins
- B. Mulch backfilled surfaces of planting areas and other areas indicated.
 - 1. Organic Mulch in Planting Areas: Apply 3-inch minimum thickness of organic mulch in individual plant watering basins and over whole surface of non-retention basin planting areas, and finish level with adjacent finish grades. Do not place mulch within 3 inches of tree trunks or plant stems.
 - 2. Gravel Mulch in Planting Areas: Apply 3-inch minimum thickness of gravel mulch over whole surface of planting area as indicated on the Drawings, and finish level with adjacent finish grades. Do not place mulch within 3 inches of tree trunks or plant stems.

3.12 GUYING, STAKING, AND WRAPPING

- A. Support trees immediately after planting to maintain plumb position.
- B. Staking: Support trees with stakes per the plans.

3.13 PLANT MAINTENANCE

- A. Prune only after planting and in accordance with standard horticultural practice to preserve natural character of the plant. Perform in presence of Engineer. Remove all dead wood, suckers, and broken or badly bruised branches. Use only clean, sharp tools. Do not cut lead shoot.
- B. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
- C. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- D. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.14 PESTICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- B. All pesticides used near natural water courses or man-made storm water bioswales shall be water safe, non-toxic to aquatic life and use a non-ionic surfactant.
- C. Pre-Emergent Herbicides (Selective and Non-Selective): Apply to tree, shrub, and ground-cover areas in accordance with manufacturer's written recommendations. Do not apply to seeded areas.
- D. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.15 WEED CONTROL

- A. Maintain a weed-free condition within planting areas. Apply pre-emergent selective herbicide to mulched beds at manufacturer's recommended rate of application.

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3.16 CLEANUP AND PROTECTION

- A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.
- B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- C. After installation and before maintenance turn-over to the Owner, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.17 DISPOSAL

- A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION

SECTION 33 05 39.49
REINFORCED CONCRETE BOX SECTIONS FOR SEWERS AND CULVERTS

PART 1 – GENERAL

1.01 SUMMARY OF WORK

- A. This work consists of constructing, transporting, joining, and finishing precast box culvert installations (normally as alternates to cast-in-place box culverts) according to Plan details and these Specifications.
- B. Precast ends refer to precast wingwalls, parapets, apron sections, toewalls, and baffles for outlets.

1.02 REFERENCES

- A. ASTM C 858 - Standard Specification for Underground Precast Concrete Utility Structures
- B. ASTM C 877 - Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast box Sections
- C. ASTM C 990 - Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
- D. ASTM C 1433 - Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains and Sewers
- E. ASTM C 1504 - Standard Specification for Manufacture of Precast Reinforced Concrete Three-Sided Structures for Culverts, Storm Drains
- F. ASTM C 1504M - Standard Specification for Manufacture of Precast Reinforced Concrete Three-Sided Structures for Culverts, Storm Drains (Metric)
- G. ASTM C 1577 - Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers Designed According to AASHTO LRFD
- H. ASTM C 1675 - Practice for Installation of Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers.
- I. ASTM C 1786 - Standard Specification for Segmental Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers Designed According to AASHTO LRFD
- J. AASHTO M 198 - Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

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- K. AASHTO M 259 - Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers
- L. AASHTO M 259M - Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers [Metric]
- M. AASHTO M 273 - Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers with Less Than Two Feet of Cover Subjected to Highway Loadings
- N. AASHTO M 273M - Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers with Less Than 0.6 m of Cover Subjected to Highway Loadings [Metric]

1.03 SUBMITTALS

- A. Submit manufacturer's catalog data on precast concrete items. Show dimensions of box culvert and location of openings including thicknesses of walls, floor and top slab. Show reinforcing wire and steel. Show materials of construction by ASTM reference and grade.
- B. Submit manufacturer's design calculations and certification signed and sealed by a professional civil or structural engineer registered in the State of California that vault design and construction comply with the specified design load conditions and the referenced ASTM specification (e.g., ASTM C 857 and C 858).
- C. Submit manufacturer's catalog data, descriptive literature, and installation instructions for the waterproofing material.
- D. Submit manufacturer's standard warranty

1.04 QUALITY ASSURANCE

- A. Finishing and Marking
 - 1. Ensure that the precast boxes and precast end components have the following markings made either by indenting into the concrete or with waterproof paint.
 - a. Name or trademark of the manufacturer
 - b. Date of manufacture
 - c. Box sections (span, rise, maximum fill height, minimum cover, and concrete design strength)
 - d. Ensure that the top of each precast box is clearly indented by marking into either the inner or outer surface of the concrete during manufacture.

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- e. Ensure that the word “TOP” is painted on the inside top surface of each box in waterproof paint. Ensure that this marking comes from the manufacturer at the plant.
- f. When so indicated on the Plans, number and match-mark the sections.
- g. Ensure each section bears the Department Inspector’s approval stamp.
- h. The manufacturer shall check all precast components for fit and connections before transporting the components to the project.

1.05 DELIVERY, STORAGE AND HANDLING

A. Delivery

- 1. Deliver materials to the site only after the County’s Representative and the County approve required submittals.
- 2. The Contractor shall observe and document that all pre-cast section delivered to the site have been properly identified with the information.
- 3. Separate damaged materials from undamaged materials and store at locations designated by the County until proper disposition of material is determined by the County and the County’s Representative.
- 4. Separate pieces without proper documentation and store until the County’s Representative approval is received.

B. On-Site Storage

- 1. Store in space allocated by the County.
- 2. Protect from puncture, dirt, grease, water, moisture, mud, mechanical abrasions, excessive heat or other damage.
- 3. Store pre-cast components on level prepared surface (not on wooden pallets). The prepared surface should be graded to drain away from precast components.

C. On-Site Handling

- 1. Use appropriate handling equipment to load, move or deploy.
- 2. The installer is responsible for storage and transporting material from storage area to installation area.

D. Damage

- 1. Damaged precast components will be documented by the County’s Representative.
- 2. Damaged precast components shall be repaired, if approved by the County’s representative, in accordance with these specifications or shall be replaced at no additional cost to the County.

1.06 PAYMENTS

- A. Payment for Work in this section shall be included as part of lump-sum or unit-price bid amount for which such Work is appurtenant.
- B. Refer to Specification Section 01 20 00 – Measurement and Payment for measurement and payment of each bid list item.

PART 2 – PRODUCTS

2.01 DESIGN CRITERIA

- A. Construct precast concrete culverts in accordance with the size, shape, form, details and at locations indicated on the Drawings and specified.
- B. Minimum length of precast box segments is 4 ft and maximum length is 16 feet.
- C. Minimum wall thickness shall be 6 inches
- D. Precast concrete culverts shall comply with ASTM C 858 except as modified herein.
- E. Design live and dead loads shall be in accordance with ASTM C 857. Design precast concrete culverts to withstand site soil conditions and traffic loading of A-16 per Table 1 of ASTM C 857 with a 30% increase due to impact. Soil lateral loads shall be as determined by ASTM C 857. Alternate design by the strength design method shall include a load factor of 1.7 times the lateral earth or hydrostatic pressures.
- F. Design shall also comply with the following restrictions:
 - 1. The maximum reinforcement ratio allowed is one-half the reinforcement ratio that would produce a balanced strain condition.
 - 2. Earth pressure shall be converted to a horizontal pressure using a coefficient of earth pressure at rest of 0.5 and not a coefficient of active earth pressure.
 - 3. Include a live load surcharge of 2 feet of soil in the design of the walls.
- G. Precast culvert construction shall be in the form of monolithic walls or horizontal wall sections; do not use panel walls.
- H. Use pre-cast box culvert ends of the same design as pre-cast box culvert sections

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- I. Use modified connector boxes of the type required for connections to precast ends.
- J. Have the manufacturer of the precast ends galvanize and provide all steel bolts, nuts, steel plates, and anchor bolts.
- K. Joints for precast sections shall be tongue and groove type
- L. Lifting.
 - 1. Cast no more than four handling devices or lifting holes in the top of each box, in each precast wing section, and in each precast apron section.
 - 2. Make holes no more than 2 in. (50 mm) in diameter nor more than 2 in (50 mm) square.
 - 3. Do not cast lifting holes in the sides or bottom of the boxes.
 - 4. Do not lift apron sections or wingwall sections by or through the pipe sleeve insets
 - 5. Lifting holes shall be filled with concrete plug after the box sections are in place.

2.02 SEALANTS AND MORTARS

- A. Fill joints between precast sections with a double layer of plastic sealing compound and make watertight. Plastic sealing compound shall comply with Federal Specification SS-S00210.
- B. Fill with mortar all recesses, lifting inserts, or other cavities not filled with plastic sealing compound. Mortar shall comply with astm c 387, type s cement.
- C. Cement shall be ASTM C 150, Type II

2.03 ADMIXUTRES

- A. If admixtures are not specified in the plans or contract documents, the Contractor must request approval in writing from the Engineer prior to its use. Accelerating admixtures, water-reducing and retarding admixtures, and air entraining admixtures must conform to AASHTO Specifications M-194 Type C or E, M-194 Type D, and M-154 respectively.

2.04 MANUFACTURER

- A. Provide Equipment from one of the following manufacturers or equal:
 - 1. Jensen Precast
 - 2. Oldcastle Precast, Inc.
 - 3. Barger and Sons

PART 3 – EXECUTION

3.01 EXCAVATING AND BACKFILLING FOR CULVERTS

- A. Provide 4-inch minimum thickness Class 2 Aggregate Base over the full width of the culvert base and extend 20 inches beyond the edges of the culvert.
- B. Excavated material may be used for structural backfill provided it conforms to the Standard Specifications for structural backfill material.

3.02 INSTALLATION

- A. Follow the equipment manufacturer's written instructions for installation and adjustment of components.
- B. Pull box sections together with a come-a-long or mechanical puller to provide jointing.
- C. The contractor shall be responsible for making any adjustments and/or modifications to the installation process that may become necessary to ensure that all equipment is properly installed and stored.

3.03 INSPECTIONS AND VERIFICATIONS

- A. The County Representative or an authorized representative will conduct an inspection of the vault fabrication process at the manufacturer's plant prior to the placement of the concrete into the formwork. The inspection will review the quality of materials, the formwork, placement of reinforcing steel, location of openings in the vault, and other construction details as shown in the approved fabrication drawings in the submittal package. If the concrete is placed into the formwork without this prior inspection, the vault will be rejected.
- B. The County Representative or an authorized representative will conduct a second inspection of the vault upon its arrival at the jobsite. The inspection will review the quality of the concrete surfaces, defects that indicate any imperfect concrete mixing and molding, surface defects indicated by honey-combed or open texture and damaged areas.

END OF SECTION

END OF PART 5

APPENDIX A: GEOTECHNICAL REPORT



June 8, 2017
Kleinfelder Project No. 20180057.001A

Mr. Bill Saumier
Senior Project Manager
San Diego County Department of Parks and Recreation
5500 Overland Ave #410
San Diego, California 92123

**SUBJECT: Geotechnical Investigation
Lakeside Equestrian Facility
Willow Road and Moreno Avenue
Lakeside, California**

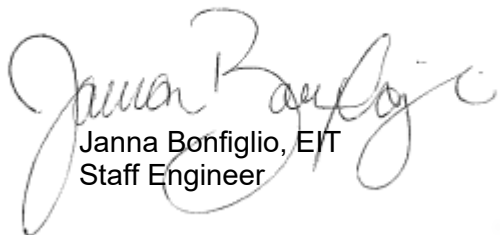
Dear Mr. Saumier,


This report presents the results of our geotechnical engineering investigation and recommendations for design and construction of the proposed Lakeside Equestrian Facility located at the northeast corner of Willow Road and Moreno Avenue in Lakeside, California.

We appreciate this opportunity to be of service and look forward to continue working with you in the future. If you have any questions about this report or need additional services, please contact us at 619.831.4600.

Respectfully submitted,

KLEINFELDER


Janna Bonfiglio, EIT
Staff Engineer


Kevin Crennan, GE 2511
Project Manager




Scott Rugg, CEG 1651
Senior Engineering Geologist





**GEOTECHNICAL INVESTIGATION
LAKESIDE EQUESTRIAN FACILITY
WILLOW ROAD AND MORENO AVENUE
LAKESIDE, CALIFORNIA
KLF PROJECT NO. 20180057.001A**

JUNE 8, 2017

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**ONLY THE CLIENT OR ITS DESIGNATED REPRESENTATIVES MAY USE THIS DOCUMENT AND ONLY FOR THE SPECIFIC
PROJECT FOR WHICH THIS REPORT WAS PREPARED.**

A Report Prepared for:

Mr. Bill Saumier
San Diego County Department of Parks and Recreation
5500 Overland Ave #410
San Diego, California 92123

**GEOTECHNICAL INVESTIGATION
LAKESIDE EQUESTRIAN FACILITY
WILLOW ROAD AND MORENO AVENUE
LAKESIDE, CALIFORNIA**

Prepared by:



Janna Bonfiglio, EIT
Staff Engineer



Scott Rugg, CEG 1651
Senior Engineering Geologist

Reviewed by:



Kevin Crennan, GE 2511
Project Manager



KLEINFELDER
550 West C Street, Suite 1200
San Diego, California 92101
Phone: 619.831.4600
Fax: 619.232.1039

June 8, 2017
Kleinfelder Project No. 20180057.001A

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D	Geotechnical Business Council Insert

1 INTRODUCTION

1.1 BACKGROUND

This report presents the results of Kleinfelder's geotechnical investigation for the proposed Lakeside Equestrian Facility, located at the intersection of Willow Road and Moreno Avenue in Lakeside, California. Based on the provided scope of work and the May 2016 Lakeside Equestrian Facility Concept Plan, we understand that the project primarily consists of two arenas, one covered and one un-covered, livestock corrals, associated dirt and gravel parking lots, a trail staging area, a perimeter track, and other associated ancillary facilities such as hoist pads, a shop and tack room, restroom facilities, and a retention basin.

The purpose of our geotechnical investigation was to evaluate the subsurface conditions at the site, determine potential geologic/seismic hazards, perform geotechnical engineering evaluations, and provide geotechnical recommendations for design and construction. This report presents the results from our subsurface exploration, laboratory testing, geotechnical analyses, and our geotechnical conclusions and recommendations pertaining to the project site.

1.2 SITE DESCRIPTION

The proposed Lakeside Equestrian Facility site is located northeast of the intersection of Willow Road and Moreno Avenue in Lakeside, California. The site location is depicted on Figure 1, Site Vicinity Map.

The approximate coordinates of the project site are:

Latitude: 32.877°N Longitude: -116.920°W

The approximate 13.88-acre project site currently consists of an oval-shaped corral with a perimeter fence at the northwest portion of the site and two rectangular-shaped, fenced-in corrals at the northeast portion. The entrance to the site is located at the west edge and leads to a cleared rectangular-shaped staging area. The staging area is bordered by a loop road that circles around the east, south, west, and central portions of the site. The remainder of the site consists of vegetated land. The site is currently used by ranchers for enclosure and upkeep of cattle.

Based on the provided existing topography plan, the site is relatively flat with approximate surface elevations generally ranging between 404 and 413 feet Mean Sea Level (MSL).

1.3 PROJECT DESCRIPTION

We understand that new construction at the site will include one covered arena and one outside arena, livestock corrals, associated dirt and gravel parking lots, a trail staging area, a perimeter track, and other associated ancillary facilities. The oval-shaped arenas are proposed to be 300 feet in length by 150 feet in width. The outside arena is located at the northwest portion of the site and will have associated bleachers at the southern edge of the arena. The covered arena is located at the east portion of the site and will have associated bleachers at the west edge of the arena. The livestock corrals will be located at the northeast portion of the site and will consist of four rectangular-shaped corrals. A shop room, tack room, and hoist pad will be located east of the livestock corrals. The trail staging area with an associated shade structure will be located at the southeast portion of the site along with a proposed retention basin.

Other site improvements will include the decomposed granite (DG) parking lots located at the west-central and south portions of the site, a perimeter trail that loops around all edges of the site, restroom facilities, and various landscaped/graded areas.

An aerial photograph of the project site and the proposed concept plan with our exploration locations are presented as Figure 2, Existing Site Conditions and Exploration Plan and Figure 3, Proposed Concept Plan and Exploration Plan.

1.4 PURPOSE AND SCOPE OF SERVICES

The purpose of our geotechnical and geologic engineering services is to evaluate the soil and geologic conditions at the site and provide conclusions and recommendations for design and construction of the proposed site development. The scope of services for this study included the following:

- Review of readily available geologic maps and aerial photography;
- Drilling and sampling two borings within the proposed arena areas;
- Drilling and sampling two shallow borings in the proposed retention basin area and performing two percolation tests;
- Excavating and sampling seven test pits throughout the site,
- Performing laboratory testing;
- Preparing a geotechnical engineering report which includes the following:
 - A description of the proposed project including a vicinity map and a site plan showing approximate locations of field explorations;

- Discussion of field exploration methods, logs of borings and test pits, percolation test results, and laboratory test procedures and results;
- Discussion of the site and subsurface conditions, including encountered groundwater levels, and anticipated excavation characteristics;
- Discussion of regional geologic setting and potential geologic hazards at the site including potential faulting and seismicity in the region;
- Seismic design parameters in accordance with the 2016 California Building Code;
- Guidelines for earthwork construction including recommendations for site preparation, temporary slopes, trench excavations, and fill/backfill placement and compaction;
- Recommendations for foundation type(s), including recommended geotechnical parameters for foundation design and estimated settlements;
- Recommendations for slabs-on-grade floor design and construction; and
- Discussion of soil properties affecting steel and corrosion and concrete attack.

The recommendations contained within this report are subject to the limitations presented in Section 5.0.

2 INVESTIGATIVE METHODS

2.1 SUBSURFACE INVESTIGATION

We performed a geotechnical subsurface investigation that consisted of two borings performed in the proposed arena footprint areas, two shallow borings and associated percolation testing performed in the proposed retention basin area, seven test pits performed at accessible areas throughout the site, and laboratory testing. The boring and test pit logs are provided in Appendix A and the laboratory test results are provided in Appendix B. The percolation test results are provided in Appendix C.

2.1.1 Borehole Explorations

The borings, designated as B-1 and B-2, were drilled by Pacific Drilling on April 6, 2017 within the proposed arena footprints. Boreholes were completed using a Fraste Multidrill drill rig equipped with 8-inch outer-diameter hollow-stem augers. The borings were each advanced to a termination depth of 20 feet below the existing ground surface. The approximate borehole locations are shown on Figures 2 and 3.

A staff engineer and an engineering geologist from our office logged the subsurface conditions encountered in the boreholes and collected soil samples for further evaluation and laboratory testing. Selected bulk and relatively intact samples were retrieved from the boreholes, sealed, and transported to our laboratory for further evaluation. A bulk sample was collected from the approximate upper 5 feet of each borehole and thereafter the typical vertical sampling interval for the boreholes was approximately every 5 feet to the total depth explored. We recorded the number of blows to drive a Modified California (Mod-Cal) sampler using a 140-pound automatic hammer dropped 30 inches. Upon completion, boreholes were backfilled with soil cuttings. A summary of the Kleinfelder field exploration program and the logs of the exploratory boreholes are presented in Appendix A.

2.1.2 Test Pit Excavations

Seven test pit excavations, designated at TP-1 through TP-6, were performed on April 6, 2017 by Cut 'n Core using a CAT 430F2 backhoe excavator. The test pits were completed to depths ranging from 4 $\frac{3}{4}$ to 5 feet below ground surface with the exception of test pit TP-4, which encountered an underground metal storage tank at approximately 2 feet below grade. TP-4 was terminated early due to the encountered tank, backfilled, and an offset test pit was performed as TP-4A.

Our field engineer logged the test pits and collected bulk soil samples for further evaluation and laboratory testing. The test pits were backfilled and compacted with excavated soil upon completion in approximate 8-inch-thick loose lifts. The test pit logs from our investigation are given in Appendix A.

2.1.3 Percolation Testing

The percolation tests, designated as PERC-1 and PERC-2, were drilled on April 6, 2017 within the proposed retention basin area. Due to the soil and pre-soak conditions, PERC-1 met the “sandy soil” test standard in accordance with the 2016 County of San Diego BMP Design Manual and therefore PERC-1 was conducted on April 6, 2017. Pre-soak conditions for PERC-2 met the “non-sandy soil” test standard and therefore the percolation test was conducted on April 7, 2017. The percolation tests were performed by our field engineer and an infiltration feasibility study was performed based on our test results in accordance with the BMP Design Manual. The infiltration feasibility study is included in Appendix C and recommendations are provided in Section 4.3.

2.2 LABORATORY TESTING

A laboratory testing program was conducted to substantiate field classifications and evaluate selected physical characteristics and engineering properties of the soils encountered. Moisture content, unit weight, Atterberg Limits (plasticity), sieve analyses, modified proctor compaction, direct shear strength, expansion index (EI), and corrosion tests were performed in general accordance with the applicable ASTM or Caltrans test methods. Results of the laboratory testing program are presented in Appendix B.

3 SITE CONDITIONS

3.1 GEOLOGIC EVALUATION

Our geologic evaluation consisted of reviewing available aerial photographs and geologic maps along with observation of the existing site conditions during our subsurface investigation. The results of the evaluation are included in the following sections.

3.1.1 GEOLOGIC SETTING

San Diego County is located within the southern portion of California's Peninsular Ranges Geomorphic Province (CGS, 2002). This province is characterized as an assemblage of north-to-northwest-trending, high-relief ranges stretching south from the Santa Monica Mountains in Los Angeles, through San Diego County, and well into Baja California, Mexico. Notable regional mountain ranges include the Santa Ana Mountains, the Laguna Mountains, and the Cuyamaca Mountains. The development of this mountainous terrain is closely tied to the transform tectonics of the San Andreas Fault System.

The County encompasses three geomorphic subzones that are set in a series of north-to-northwest trending belts, roughly parallel to the Pacific coastline. From west to east, these zones are composed of a relatively narrow, low-relief coastal plain; a dominant, central, high-relief mountainous zone; and a low-lying desert zone on the east. The project site is located within the western edge of the central mountainous subzone, adjacent to the coastal plain subzone.

The mountainous subzone, which includes the site, is underlain by basement material of Cretaceous to Jurassic age igneous and metamorphic bedrock described above. The coastal plain subzone to the west of the site is underlain by Cretaceous to Tertiary rocks consist of a variety of sandstones, claystones, siltstones and conglomerates which overlie the basement rocks described above.

During the latest Pleistocene, the land surface throughout San Diego County was down-cut and eroded by fluvial processes in response to a world-wide glacially induced drop in sea level. This erosional event resulted in the dissected system of east to west flowing drainages and intervening basins that empty into the Pacific Ocean. Near the coast, these drainages down cut several hundreds of feet below current sea-level elevations. Near the end of the Pleistocene epoch and continuing up to the present, sea-level gradually rose as the continental glaciers receded, which forced in-filling of the eroded drainages with alluvial sediments. Mission Valley which is drained by the San Diego River, is one of the larger of these in-filled drainage features of San Diego

County. The project site is located within the San Vicente Creek Drainage which is a tributary to the upper drainage area of the San Diego River.

The regional geology of the project area is depicted on the Regional Geologic Map (Todd 2004) of Figure 4. We also reviewed other historic geologic maps covering the site by Tan (1992 and 2002) and vintage aerial photography (USDA 1953) as part of our geologic evaluation.

3.1.2 TECTONIC SETTING

California is one of the most tectonically active areas of the United States. This is because it straddles the boundary of two global tectonic plates known as the North American Plate (on the east) and the Pacific Plate (on the west). The main plate boundary fault is defined by the San Andreas fault which crosses through some of the most densely developed areas of both southern and northern California. It stretches northwest from the Gulf of California in Mexico, through the desert region of the Imperial Valley, crossing the San Bernardino region, and traversing up into northern California, where it eventually trends offshore near San Francisco (Jennings, 1994; Jennings and Bryant, 2010). Within southern California, the plate boundary is a complex system of numerous faults known as the San Andreas Fault System (SAFS) that spans a 150-mile-wide zone from the main San Andreas fault in the Imperial Valley, westward offshore of San Diego (Powell et al., 1993; and Wallace, 1990). The major faults east of the site (from east to west) include the San Andreas, San Jacinto, and Elsinore faults. Major faults west of the site include the Rose Canyon-Newport-Inglewood, Palos Verdes-Coronado Bank, San Diego Trough, and San Clemente faults.

One of the most dominant zone of active faulting within the San Diego region is the Rose Canyon Fault Zone (RCFZ). The fault zone extends through the coastal portion of metropolitan San Diego, north from the southern coast of Coronado up through La Jolla where it trends offshore near the La Jolla Shores Beach. North of La Jolla the fault continues north-northwest sub-parallel to the coastline up towards Newport Beach. South of downtown San Diego, the fault zone splits into several splays that underlie San Diego Bay, Coronado, and the ocean floor south of Coronado. The fault zone consists of predominantly right-lateral strike-slip faults but certain segments also display normal, oblique, or reverse components.

The nearest active faults to the site are the Rose Canyon Fault, located approximately 18 miles southwest of the site, and the Elsinore Fault, located approximately 25 miles northeast of the site. An active fault is one which has undergone movement within the last 11,000 years. Further

discussion of faulting and seismicity relative to the site is provided in the Section 4.1.3 of this report and the zone of faulting near the site is depicted on Figure 5.

3.2 SITE GEOLOGY AND SUBSURFACE CONDITIONS

Geologic units observed in the borings and test pits consist of Holocene-age alluvial deposits. The alluvial deposits were found to underlay surficial fill material in test pits TP-4, TP-4A, and TP-6 and borings PERC-1 and PERC-2. Based on the reviewed geologic maps, the alluvial deposits are underlain by Early Cretaceous-age granitoid rocks predominantly consisting of tonalite and granodiorite. The granitoid rock formation was not encountered in our subsurface investigation to a maximum depth of 20 feet below grade.

The aerial extent of these geologic units is depicted on Figure 4. Descriptions of these units are provided in the boring and test pit logs (Appendix A), and generalized descriptions are provided in the subsequent sections below.

3.2.1 Artificial Fill (af)

Artificial fill soils were encountered in test pits TP-4, TP-4A, and TP-6 and borings PERC-1 and PERC-2. Based on a review of historic aerial photographs (USDA 1953), these borings are located near drainage channels that previously existed at the site. Due to the underground tank encountered in test pit TP-4 and the close proximity of these borings and test pits to historic drainage channels, it is likely that the fill was placed during previous developments of the site.

The fill encountered generally consisted of light brown, olive brown, and dark brown silty sand and sandy silt with varying amounts of gravel and debris (fencing, plastic tubing, concrete, and asphalt) and trace amounts of boulders. The thickness of the fill layer ranged from 2 to 5 feet. Test pit TP-6 terminated in the fill layer about 4 $\frac{3}{4}$ feet below ground surface. It is possible that deeper fills may be present between our exploration locations.

We did not obtain nor were we provided information on the placement and compaction of the fill material and thus the fill is considered undocumented.

3.2.2 Young Alluvial Deposits (Qya)

Alluvial deposits of the Holocene age were encountered below the fill materials in tests pits TP-4, TP-4A, and TP-6 and borings PERC-1 and PERC-2, and at the surface of the all the remaining test pits and borings. The alluvial deposits consisted of silt, sandy silt, silty sand, and poorly-graded sand and extended to the termination depths of the borings and test pits. The

alluvial deposits were observed to contain more coarse-grained material at the southern portion of the site. Field N-values of the coarse-grained portions of the alluvial deposits ranged from 2 to 10 blows per foot indicating very loose to medium dense material. Field N-values of the fine-grained portions of the alluvial deposits ranged from 7 to 36 blows/foot and pocket penetrometer values of the fine-grained portions of the alluvial deposits ranged from 0.25 to 2.25 tsf indicating soft to very stiff material.

3.2.3 Groundwater

Groundwater was not encountered in any of our borings or test pits during our investigation to a maximum depth of 20 feet. Based on a review of a groundwater monitoring report for the nearby Lakeside Road Station entitled "Supplemental Groundwater Monitoring Report, Fourth Quarter 2005", dated January 27, 2006 and prepared by Leighton Consulting, Inc., groundwater was reportedly measured at approximate elevations 388 to 392 MSL between October 2004 and November 2005. The Lakeside Road Station site is located approximately 0.5 miles southeast of our project site.

3.2.4 Infiltration

Our review of the Natural Resource Conservation Service (NRCS) Soil Survey Map indicates that the site soils are Vasilia sandy loam. This material is designated as being of the Hydrologic Soils Group "A" which is defined as a well-drained material (very low runoff potential).

Two percolation tests were performed during our investigation. PERC-1 resulted in an unfactored infiltration rate of 0.31 inches per hour and a factored infiltration rate of 0.12 inches per hour. Percolation test PERC-2 resulted in an unfactored infiltration rate of 0.11 inches per hour and a factored infiltration rate of 0.04 inches per hour. The factored infiltration rates assume a Safety Factor of 2.6. Infiltration design and construction recommendations are further discussed in Section 4.3 and an infiltration feasibility study is provided in Appendix C.

4 DISCUSSIONS, ANALYSIS, AND RECOMMENDATIONS

Based on the results of our site investigation, document review, laboratory testing, and data analysis, it is our opinion that the construction of the proposed project is feasible from a geotechnical standpoint provided our recommendations are incorporated into the design and construction of the project. Kleinfelder should be contacted to re-evaluate our recommendations if changes are made to the planned site grading and/or layout. All grading, excavation, and backfill operations should be observed and tested by a representative of Kleinfelder.

Geotechnical engineering discussion, conclusions, and recommendations for the proposed Lakeside Equestrian Facility structures and site improvements are presented in the following sections. These discussions, conclusions, and recommendations are based on the concept plan provided by the County of San Diego Department of Parks and Recreation and the results of Kleinfelder's field explorations, laboratory testing, and engineering analyses.

4.1 POTENTIAL GEOLOGIC HAZARDS

Kleinfelder has reviewed the site with respect to potential geologic hazards. This evaluation is based on review of geologic maps, aerial photographs, our geologic site reconnaissance, and boring, test pits, and laboratory data.

Potential geologic hazards considered in our study include surface rupture, seismic shaking, lurching, liquefaction, seismically induced settlement, seiches and flooding, landslides, and expansive soils. The following sections discuss these hazards and their potential at this site in more detail.

4.1.1 Surface Rupture

As previously discussed in Section 3.1.2, the subject site is not underlain by known active or potentially active faults. The closest active faults to the project site are the Rose Canyon Fault, located approximately 18 miles southwest of the site, and the Elsinore Fault, located approximately 25 miles northeast of the site. The results of our site reconnaissance and review of historical aerial photography did not reveal indications of faults crossing the project site. Based on this data, it is our opinion that the potential for ground rupture due to faulting at the site is low.

4.1.2 Ground Lurching

Ground lurching is defined as movement of low density materials on a bluff, steep slope, or embankment due to earthquake shaking. Steep fill slopes are particularly prone to lurching. Based on the relatively gentle slopes observed on the project site, it is our opinion that the hazard with respect to ground lurching is low.

4.1.3 Seismic Shaking and CBC Seismic Design Parameters

The most significant seismic events likely to affect the project site would be an earthquake with a Moment Magnitude of approximately $M_m=6.9$ (Petersen et al. 2008) resulting from rupture along the Rose Canyon Fault located approximately 18 miles away, or an earthquake with a Moment Magnitude of approximately $M_m=7.4$ (Peterson et el. 2008) resulting from a rupture along the Elsinore Fault located approximately 25 miles away. Ground motion parameters for design were generated using the USGS Earthquake Hazards Program online application for US Seismic Design Maps using the site coordinates presented in Section 1.2 of this report (<http://earthquake.usgs.gov/designmaps/us/application.php>).

Our recommendations for seismic design parameters are in accordance with the 2016 California Building Code (CBC) and 2010 ASCE 7 Minimum Design Loads for Buildings and Other Structures. Based on our subsurface investigation and engineering judgement, we recommend the site be classified as Seismic Site Class D. Site Class D is defined as stiff soil with average shear wave velocities within the upper 100 feet between 600 and 1,200 ft/s, an average field standard penetration resistance between 15 and 50 blows/ft, or an average undrained shear strength between 1,000 psf and 2,000 psf.

Seismic design parameters are based on the Site Class D designation and on the site locations with respect to mapped spectral acceleration parameters SS and $S1$. The recommended seismic design parameters are summarized in Table 1.

Table 1
Recommended 2016 CBC Seismic Design Parameters

Design Parameter	Symbol	Recommended Value	2016 CBC (ASCE 7-10) Reference(s)
Site Class	--	D (stiff soil profile)	Section 1613.3.2 (Section 11.4.2)
Mapped MCE_R (5% damped) spectral acceleration for short periods	S_s	0.911 g	Section 1613.3.1 (Section 11.4.1)
Mapped MCE_R (5% damped) spectral acceleration for a 1-sec period	S_1	0.349 g	Section 1613.3.1 (Section 11.4.1)
Short Period Site Coefficient	F_a	1.136	Table 1613.3.3(1) (Table 11.4-1)
Long Period Site Coefficient (at 1-second period)	F_v	1.703	Table 1613.3.3(2) (Table 11.4-2)
Peak Ground Acceleration	PGA	0.251 g	(Section 11.4.5)
MCE_R Peak Ground Acceleration adjusted for site class effects (S_M at $T=0$)	PGA_M	0.251 g	N/A
MCE_R (5% damped) spectral response acceleration for short periods adjusted for site class ($F_a * S_s$)	S_{MS}	1.035 g	Section 1613.3.3 (Section 11.4.3)
MCE_R (5% damped) spectral response acceleration at 1-second period adjusted for site class ($F_v * S_1$)	S_{M1}	0.594 g	Section 1613.3.3 (Section 11.4.3)
Design spectral response acceleration (5% damped) at short periods ($2/3 * S_{MS}$)	S_{DS}	0.690 g	Section 1613.3.4 (Section 11.4.4)
Design spectral response acceleration (5% damped) at 1-second period ($2/3 * S_{M1}$)	S_{D1}	0.396 g	Section 1613.3.4 (Section 11.4.4)

Notes: MCE_R : Risk-Targeted Maximum Considered Earthquake

4.1.4 Liquefaction and Seismically Induced Settlement

The term liquefaction describes a phenomenon in which saturated, cohesionless soils temporarily lose shear strength (liquefy) due to increased pore water pressures induced by strong, cyclic ground motions during an earthquake. Structures founded on or above potentially liquefiable soils may experience bearing capacity failures due to the temporary loss of foundation support, vertical settlements (both total and differential), and undergo lateral spreading. The factors known to influence liquefaction potential include soil type, relative density, grain size, confinement, depth to groundwater, and the intensity and duration of the seismic ground shaking. The soils most susceptible to liquefaction are loose, saturated sands and sandy silts. Liquefaction is most

prevalent in loose to medium dense sandy and gravelly soils below the groundwater table, but can also occur in non-plastic to low plasticity fine-grained soil in areas of high groundwater.

Our borings were advanced to a depth of 20 feet and alluvial soils are anticipated to extend to significant depths. We did not encounter groundwater during our investigation to a maximum depth of 20 feet below grade. However, we reviewed the January 27, 2006 "Supplemental Groundwater Monitoring Report, Fourth Quarter 2005" prepared by Leighton Consulting, Inc. for the San Diego County Department of Public Works Lakeside Road Station. This groundwater monitoring report reported groundwater at approximate elevations 388 to 392 MSL measured within three monitoring wells between October 2004 and November 2005. The Lakeside Road Station site is located approximately 0.5 miles southeast of our project site.

Based on our experience in the project vicinity, nearby approximate groundwater elevations, as well as the presence of deep loose to medium dense coarse-grained material at the site, we estimate that total liquefaction induced settlements may be on the order of 2 to 4 inches. Based on the depth of groundwater over 20 feet, differential settlements should be significantly less than the total settlements and are not considered a significant hazard to the proposed improvements.

4.1.5 Flood and Seiche Hazards

The Federal Emergency and Management Administration (FEMA) maintains a collection of Flood Insurance Rate Maps (FIRM), which cover the entire United States. These maps identify those areas that may be subject to 100-year and 500-year flood events. According to FEMA FIRM 06073C1393G dated May 16, 2017, a majority of the site is located in flood zone A indicating the site is subject to inundation by a 100-year flood event, however, base flood elevations have not been determined. The northeast corner of the site falls within flood zone AE indicating base flood elevations have been determined for this area. The map indicates that the maximum potential base flood level in zone AE could reach an elevation of approximately 416 feet MSL. The potential flood event is due to San Vicente Creek located approximately 350 feet west of the site.

A seiche is an oscillatory wave that develops in an enclosed or partially enclosed body of water, such as a bay or lake, in response to seismic shaking from an earthquake. Review of recent aerial imagery indicates the presence of a small lake located approximately 700 feet south of the site at an elevation approximately 20 feet lower than our site. Due to the distance away from the site and the lower elevation of the lake, the hazard of seiches is considered relatively low.

4.1.6 Landslides

Landslides are deep-seated ground failures (several tens to hundreds of feet deep) in which a large arcuate or block shaped section of a slope detaches and slides downhill. Landslides can cause damage to structures both above and below the slide mass. Several formations within the San Diego region are particularly prone to landslides. These formations generally have high clay content and mobilize when they become saturated with water. Other factors, such as steep dipping bedding that project out of the face of the slope and/or the presence of fracture planes will also increase the potential for a landslide.

Due to the generally level (flat lying) configuration of the site, a deep-seated landslide hazard here is considered negligible. Hillslopes composed of the granitoid rock with steep slope gradients are located approximately 0.3 miles east of the site. Review of geologic maps (Todd 2004, Tan 1992 and 2002), aerial photography (USDA 1953), and our site reconnaissance did not reveal indication of the relatively nearby hillslopes to be affected by a deep-seated landslide. Based on our review, it is our opinion that the hazard with respect to a deep-seated landslide is low.

4.1.7 Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or concrete slabs supported on grade.

A representative sample of the near-surface soils in boring B-2 was tested in accordance with UBC 18-2, "Expansion Potential". The sample of sandy silt was found to have an Expansion Index (EI) of 5 and is considered representative of the material found on the site. According to the 2016 CBC, soils with an EI of 0 to 20 are considered to have a low expansion potential. Further, Atterberg Limits testing on a near-surface sample from boring B-1 resulted in a liquid limit of 31 percent, a plastic limit of 24 percent, and plasticity index of 7 percent. Based on these results and our visual evaluation of soil variability at the site, we anticipate the near-surface soils at the site have a low expansion potential.

4.2 EARTHWORK

4.2.1 Demolition and Site Preparation

The existing fencing and vegetation in the proposed structure footprints should be removed prior to construction. Prior to initiating grading operations, all existing surficial covering, debris, oversized materials (greater than 6 inches), and other deleterious materials within construction areas should be stripped and completely removed from the project site. If existing undocumented fill soils are encountered within the structure footprints, then the undocumented fill should be completely removed prior to the placing of compacted fill to raise grades. Portions of the existing undocumented fill soils that are suitable for reuse as new compacted fill may be stockpiled at approved areas of the site for future use.

Excavations for removal of any man-made structures within the structure footprints, including buried pipes, utilities, and the existing tank encountered at test pit TP-4 within the covered arena footprint, should be replaced with approved compacted fill. Buried pipes outside of the building area should be capped as a minimum; however, they should be evaluated by Kleinfelder on an individual basis during construction for potential additional measures. Excavations for removal of any man-made structures should be dish-shaped to allow for access of compaction equipment and should be properly compacted in accordance with Section 4.2.4 of this report.

4.2.2 Soil Characteristics

The existing undocumented fill soils are considered unsuitable for structural support of floor slabs and foundations. These soils mainly consist of silty sand and sandy silt with zones of gravel, cobble, and debris (fencing, plastic tubing, concrete, and asphalt). These soils are underlain by alluvial deposits which predominately consists of silt, sandy silt, silty sand, and poorly-graded sand. The excavation of these soils should be possible with conventional heavy-duty excavating equipment. Special handling of oversized material in the existing undocumented fills should be planned.

4.2.3 Remedial Earthwork

As previously discussed, existing undocumented fills and alluvial deposits are considered unsuitable for structural support of floor slabs and foundations for the proposed structures in their current condition. We recommend that the fill soils be completely excavated from within structural footprints, stripped of oversized material, debris, and other deleterious material. The undocumented fill and the upper portion of alluvial soil should be recompacted as engineered fill

to a minimum depth of 3 feet below shallow foundations, concrete slabs and floor slabs and a minimum depth of 12 inches in the DG parking area. These soils should be compacted to a relative compaction of at least 90 percent per ASTM D1557 per Section 4.2.4 of the report.

4.2.4 Engineered Fill

The majority of soils excavated from the site may be used as engineered fill, provided that they are free of oversized materials, organic materials, expansive clay, and deleterious debris. Oversize material in excess of 6 inches in diameter should not be used in structural fill and material larger than 3 inches should not be used within the upper 3 feet of structural (foundations, parking, etc.) subgrades. The upper 6 inches of on-site structural fill below the slab materials should have an expansion index (EI) of less than 20 as evaluated by ASTM D4829. The expansion result on a representative sample of the on-site soils indicates that the on-site soils meet this criterion.

Import materials used as structural fill (if any) should have an expansion index less than 30, a minimum R-value of 20, less than 30 percent of the particles passing the No. 200 sieve, and have a maximum particle size of 3 inches in dimension. Import materials placed within the upper 6 inches below the slab materials should have an expansion index (EI) of less than 20.

Approved on-site and import soils placed as structural fill should be moisture conditioned between optimum and 3 percent above optimum moisture content and compacted to a minimum of 90 percent of the maximum dry density in accordance with ASTM D1557. The maximum lift thickness for fill soils will be dependent on the type of compaction equipment utilized. Approved engineered fill should generally be placed in uniform lifts not exceeding approximately 8 in loose thickness.

Approved engineered fill used in non-structural areas should be moisture conditioned to between 0 and 2 percent above optimum moisture content and compacted to a minimum of 90 percent of the ASTM D1557 maximum dry density.

4.2.5 Subgrade Preparation

Undocumented fill was encountered in test pit TP-4, located in the covered arena footprint, to a depth of 2 feet below grade and in test pit TP-6, located in the DG parking area, to the termination depth of 4 ³/₄ feet below grade. All undocumented fill in structural areas should be completely removed and either replaced and/or recompacted in accordance with Section 4.2.4 of this report. The upper portion of loose and dry alluvial soils should also be removed and recompacted within

structural areas. All undocumented fill and alluvial soil in non-structural areas should be scarified to a depth of 12 inches, moisture conditioned and recompacted. The DG and the upper 12 inches of subgrade in the DG parking area should be compacted to a relative compaction of at least 95 percent per ASTM D1557

All site preparation and fill placement activities should be observed and tested by a representative of our firm. All subgrade areas should be proofrolled/compacted and approved by the Contractor's geotechnical representative prior to the pouring of concrete and placement of new fill.

4.2.6 Temporary Excavations

Shallow, temporary utility trench excavations are anticipated at the site. Additionally, excavations will be required to remove undocumented fill from the building footprints. If very steep or vertical excavations are required in excess of 4 feet in depth, we recommend the sidewalls be laid back or shored in accordance with the U.S. Occupational Safety and Health Administration (OSHA) standards. If necessary, the contractor should be responsible for the structural design and safety of temporary shoring systems and we recommend that this design be submitted to Kleinfelder for review and approval.

For preliminary planning, the on-site fill and alluvial deposits can be classified as OSHA Type C soil for evaluating OSHA sloping requirements. The actual OSHA soil type should be determined by the contractor's competent person in the field at the time of construction based on the exposed conditions observed in the field. Type CB soils should have 1.5H:1V temporary construction excavation slopes up to 20 feet in height. If stability of an excavation becomes questionable during construction, we recommend the excavation should be evaluated promptly by Kleinfelder.

No surcharge loads, such as the weight from construction equipment or soil stockpiles, should be placed within 10 feet from the top of open excavations. Construction personnel should be aware that soil conditions may change rapidly if soil moisture conditions change or if soils that have been disturbed by previous excavations are encountered. All surface water should be diverted away from open excavations.

4.2.7 Pipe Bedding and Trench Backfill

Pipe bedding should consist of granular material having a sand equivalent value of 30 or more. The sand should be placed in a zone that extends a minimum of 3 inches below and 12 inches above the pipe for the full trench width. The bedding material should be compacted to a minimum of 90 percent of the maximum dry density in accordance with ASTM D1557. Trench backfill above

pipe bedding may consist of approved, on-site or import soils placed in lifts no greater than 8 inches in loose thickness and compacted to 90 percent of the maximum dry density. Backfill should not contain material greater than 3 inches in size. Sand cement slurry is an acceptable alternative to soil backfill, provided it contains a minimum of 2 sacks of cement per cubic yard of sand.

4.2.8 Erosion Prevention and Sedimentation Control

The potential for soil erosion is largely impacted by local soil characteristics, vegetative cover, topographic relief, and the frequency and intensity of rainfall and wind. Removal of vegetation and disturbance to surficial soils by construction activities may result in local increases of erosion rates in unprotected areas. As a result, sedimentation may increase in local drainages at site perimeters and slope intersections. Uncontrolled diversion of storm water runoff from the site to unlined drainage channels could result in extensive erosion due to concentrated flow. This is particularly true during and immediately following site grading.

Site development normally increases the amount of impervious area, thus increasing the volume of storm water runoff. Concentration of flow in drainage structures can result in increased flow velocities and erosion potential. Soils on slopes exposed by site development will be subject to erosion by wind and water. This can result in increased turbidity of runoff to the downstream area.

Erosion prevention and sedimentation control is a complex issue and is usually best addressed by sound planning and the use of Best Management Practices (BMPs). Erosion control BMPs are the “best” available technologies that are consistent with conventional local control practices. Implementation is dependent on site conditions and applicability of proven cost-effective methods. The selection and implementation of construction BMPs is dependent on what existing features need to be protected or mitigated.

BMPs for erosion and sediment control are selected to meet the specific objectives based on site conditions, serviceability, and cost. Various BMPs in combination or succession may be needed for a given area. Selection of erosion control BMPs should be based on minimizing disturbed areas, stabilizing disturbed areas, and protecting slopes and channels. It also should be based on retaining sediment on-site and controlling the site perimeter. All implemented BMPs should be regularly monitored and controlled after initial installation, as well as during and after any storm generating runoff, to determine maintenance requirements and the general condition of the installed system.

To reduce soil erosion and sediment transport, protective material such as gravel, crushed stone, and other effective erosion control materials should be used to stabilize exposed soils. Slopes should be provided with temporary drainage and erosion control measures during construction until permanent measures can be installed. Storm water runoff from construction areas should be conveyed to temporary diked detention areas for sediment deposition, then discharged to the existing natural drainage courses with velocities slow enough to prevent further erosion in the drainage courses.

Control of erosion and sedimentation on recently graded construction sites require both vegetative and structural measures. Vegetative species used to control erosion should be selected to accommodate the soil characteristics and climate at the site. Storm runoff control should be provided during and after completion of site grading by using diversion dikes and permanent drainage facilities. Sediment retention structures such as sediment basins, sediment traps, or silt fences should be used to keep eroded material on the site. Straw bales used alone, or in combination with geotextiles, can be effective sediment retention structures when properly installed and maintained.

We recommend the following practices be part of the project:

- Use temporary plant cover, mulching, and/or structures to control runoff and protect areas subject to erosion during construction.
- Minimize soil exposure during the rainy season by proper timing of grading and construction and be prepared to shut down all earthwork if heavy precipitation occurs.
- Have erosion control equipment and materials onsite if needed in an emergency to quickly construct temporary collectors, diversion channels, intercept drains, berm, dikes, or filters.
- Accommodate the surface runoff from all disturbed areas. Prepare drainage-ways that handle concentrated or increased runoff from disturbed areas by using riprap or other lining materials to control erosion.
- Trap sediment-laden runoff in basins to allow soil particles to settle out before flows are released to receiving waters.
- Reduce erosion by limiting the area and time of exposure, and by the provision of diversion channels.

4.2.9 Site Drainage

Final elevations at the site should be planned so that positive drainage is established around structures such that surface water runoff is directed away from building foundations, floor slabs,

parking areas, and other proposed elements of the project. Positive drainage is defined as a slope of 2 percent or more for a distance of 5 feet away from structure. Roof gutters and downspouts should be installed on structures. Downspouts should discharge to controlled drainage systems. Parking areas should be sloped and drainage gradients maintained to carry surface water away from structural foundations.

4.2.10 Construction Observation

The earthwork recommendations presented in this report are based on our understanding of the proposed project and anticipated site conditions. The interpolated subsurface conditions should be evaluated by Kleinfelder personnel in the field during construction. Final project drawings and specifications should be reviewed by Kleinfelder prior to the commencement of construction so that the recommendations given in this report can be re-evaluated based on changes in site grading and configuration. We should continuously observe the clearing/grubbing, earthwork/grading, foundation excavation/preparation, and trench backfilling operations. Such observations are considered essential to identify field conditions that differ from those anticipated, to adjust designs to actual field conditions and to determine that the grading is accomplished in general accordance with the recommendations of this report. Recommendations presented herein are contingent on Kleinfelder performing such services.

4.3 STORMWATER INFILTRATION STUDY

We have evaluated the site in conformance with the 2016 County of San Diego BMP Design Manual for Permanent Site Design, Storm Water Treatment and Hydromodification Management (The Manual). For the purpose of this report, infiltration is defined as the flow of water through the ground surface and percolation is defined as the downward flow of water through the subsurface soil layers. Infiltration may be controlled primarily by factors such as the type and porosity of the surface filtering media, maintenance of these media, surface slopes, surface vegetation, and intensity, duration, and type of precipitation. Percolation may be controlled primarily by the subsurface conditions and properties such as soil grain size, density, layering, porosity, hydraulic head, and proximity the groundwater. Surface drainage and maintenance will largely determine the site's infiltration rate and the amount of water that will infiltration for any given storm. The percolation rate will depend locally on the soil layering and will be controlled by the finer-grained soils.

Borehole percolation testing was the selected method for field infiltration testing at the site. Two percolation tests were performed at two different locations. The percolation tests were performed

in general accordance with those set forth in California Test 750. The tests were performed in drilled boreholes advanced to a depth of 5 feet below existing grade. The measured percolation rates have been converted to an adjusted short term infiltration rate based on the borehole geometry using the Porchet Method (Ritzema, 1994) and are presented in Table 2. These values are converted to long term design infiltration rates by using correction factors based on Form I-8 of the BMP Design Manual.

Table 2
Summary of Adjusted Infiltration Rates

Boring	Tested Depth from Ground Surface (feet)	Adjusted Short Term Infiltration Rate (inch/hour)	Soil Description
PERC-1	0-5	0.31	Silty Sand
PERC-2	0-5	0.11	Sandy Silt

Note that relatively clean water was used to perform the tests above. However, surface runoff water from the site would likely contain silt, clay, and/or other materials that would eventually decrease the percolation rates. The provided field percolation rates in Table 2 do not include reduction factors for long term performance. These values are converted to long term design infiltration rates in the following sections by using correction factors based on Form I-9 of the BMP Design Manual.

Based on visual soil classifications and laboratory sieve analyses of soil samples collected during our field exploration at the percolation test locations, subsurface materials mostly consist of silty sand and sandy silt within the depths of the test. The results are presented on the boring logs and lab results in Appendix A and Appendix B, respectively.

4.3.1 Mitigation Measures

The following bullets present typical considerations (geotechnical and other) for implementation of infiltration systems, along with a discussion of site specific conditions related to these considerations.

- Presence of fill soils below building footprints: The areas of infiltration should be located away from proposed foundation areas. Infiltrated water near building foundations can induce settlement of fill and reduction in bearing pressure below building foundations which can adversely impact the building.

- Presence of shallow rock: Infiltration would be impeded if bedrock is located near the surface. However, shallow rock was not encountered during our investigation and is not a concern.
- Building sites located adjacent to or within landslide hazard areas or hillside grading areas: This site is not located near landslide hazard areas.
- Sites with initial seasonal high groundwater elevation within 10 feet of the invert of a proposed basin: Groundwater was not encountered during our investigation to a maximum depth of 20 feet below grade and is not within 10 feet of the proposed basins.
- Site soils with a potential for liquefaction: Due to the presence of loose granular material at the site, and the assumed groundwater elevation based on nearby groundwater level readings, the site is potentially liquefiable. Infiltration into these granular materials may increase the potential for liquefaction to occur at the site during a seismic event. However, the impact is not significant enough at the site to warrant mitigation measures.
- Site soils with a moderate or high expansion potential: Based on the laboratory test results, the observed site soils appear to have a low expansion potential.
- Sloping sites: Infiltration into sloped areas could result in infiltration into differing subsurface conditions. However, the proposed retention basin is located at a relatively flat portion of the site.
- Sites with soil and/or groundwater contamination: No known contamination is present near the site.

4.3.2 Data Evaluation

The results of the field percolation testing program provide a long-term design infiltration rate based on correction factors contained within Tables D.5-1 and D.5-2 of the 2016 BMP Design Manual. These tables are summarized in Tables 3 and 4 below.

Table 3
Suitability Assessment Related Considerations for Infiltration Facility Safety Factors*

Consideration	High Concern (3 Points)	Medium Concern (2 Points)	Low Concern (1 Point)
Assessment methods (see explanation below)	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates Use of well permeameter or borehole methods without accompanying continuous boring log Relatively sparse testing with direct infiltration methods	Use of well permeameter or borehole methods with accompanying continuous boring log Direct measurement infiltration area with localized infiltration measurement methods (e.g., infiltrometer) Moderate spatial resolution	Direct measurement with localized (double-ring infiltrometer & borehole) infiltration testing methods at relatively high resolution or Use of extensive test pit infiltration measurement methods (Extensive refers to large excavation, filling with water and monitoring drawdown – ideally 30 to 100 square feet)
Texture Class	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site soil variability	Highly variable soils indicated from site assessment, or unknown variability	Soil borings/test pits indicate moderately homogeneous soils	Soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<5 ft below facility bottom	5-15 ft below facility bottom	>15 below facility bottom

*As presented in Table D.5-1 in Appendix D on page D-13 of BMP Design Manual

Table 4
Design Related Considerations for Infiltration Facility Safety Factors*

Consideration	High Concern (3 Points)	Medium Concern (2 Points)	Low Concern (1 Point)
Level of pretreatment/ expected influent sediment loads	Limited pretreatment using gross solids removal devices only, such as hydrodynamic separators, racks and screens AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pretreatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be moderate (e.g., low traffic, mild slopes, stabilized pervious areas, etc.).	Excellent pretreatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops/non-sanded road surfaces.
Redundancy / resiliency	No "backup" system is provided; the system design does not allow infiltration rates to be restored relatively easily with maintenance.	The system has a backup pathway for treated water to discharge if clogging occurs <u>or</u> infiltration rates can be restored via maintenance.	The system has a backup pathway for treated water to discharge if clogging occurs <u>and</u> infiltration rates can be relatively easily restored via maintenance.
Compaction during construction	Construction of facility on a compacted site or increased probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Equipment traffic is effectively restricted from infiltration areas during construction and there is low probability of unintended/ indirect compaction.

*As presented in Table D.5-2 in Appendix D on page D-14 of BMP Design Manual

4.3.3 Design Infiltration Rates

Based on our evaluation of the percolation test data, the soils encountered exhibit infiltration rates for *short-term, non-factored infiltration rates between 0.31 and 0.11 inch/hour*. The long-term design infiltration rate was calculated by using the following correction factors based on Form I-9 of the BMP Design Manual. The completed forms are presented in Appendix C. Long-term design infiltration rates have been estimated for PERC-1 and PERC-2 and the values are presented in Table 5.

Table 5
Design Infiltration Rates*

Boring	Safety Factor	Long Term Design Infiltration Rate (Inch/hour)
PERC-1	2.6	0.12
PERC-2	2.6	0.04

*Form I-8 of each borehole is presented in Appendix C

4.3.4 Recommendations and Conclusions

Based on the testing performed and the correction factors presented above, we recommend a combined safety factor of 2.6 for locations PERC-1 and PERC-2.

Based on the completed Categorization of Infiltration Feasibility Condition Form I-8 contained in the BMP Design Manual, we classify the site as a feasibility screening category of "Partial Infiltration". Partial infiltration is suggested since long term infiltration rates are above 0.01 inches/hour and well below 0.5 inches/hour. The completed Form I-8 worksheets for each percolation test location performed at the site are included in Appendix C of this report.

4.4 FOUNDATIONS

4.4.1 Shallow Foundations

Shallow spread and/or continuous foundations bearing on new structural fill are considered feasible for support of the proposed structures at the site. At the time of this report, finished floor elevations and structural loads have not been provided to us.

The existing undocumented fill at the site is considered unsuitable for support of foundation loads in their current conditions. Therefore, we recommend that the existing fill at the site be completely removed within the structure footprints. We also recommend that the alluvial soils within 3 feet below the bottom of foundation be excavated and recompact within structure footprints.

Shallow foundations bearing on approved structural fill may be designed using an allowable bearing pressure of 2,000 pounds per square foot (psf). This design value can be increased by one-third for short term loads such as those due to wind and seismic forces. Total settlements may be on the order of 1 inch. All footings must have a minimum width and embedment of 1 foot.

Resistance to horizontal loadings can be developed by passive earth pressure on the sides of footings and frictional resistance developed along the footing bottoms. Passive resistance to

lateral earth pressure may be calculated using an equivalent fluid unit weight of 250 pcf for shallow footing embedded in the structural fill or alluvial deposits. A friction coefficient of 0.30 may be applied to vertical dead loads supported by approved structural fill or alluvial deposits. If friction is used in combination with passive pressure, then the friction coefficient should be reduced to 0.15.

Footings may experience a reduction in bearing capacity, or an increased potential to settle, when located in close proximity to existing or future utility trenches. Furthermore, stresses imposed by footings on the utility lines may cause cracking, collapse, and/or loss of serviceability. To reduce this risk, utility excavations should not extend below a 2H:1V plane projected downward from 1 foot above the bottom of the outside edge of the footing. Also, no parallel utility excavations should be made within a lateral distance of 2 feet outside the footing.

Prior to placing reinforcing steel or concrete, footing excavations should be cleaned of all debris, loose or soft soil, and water. All footing excavations should be observed by an engineer or an engineering technician under the direction of the project geotechnical engineer prior to placement of reinforcing steel and concrete to check that the recommendations contained herein are implemented during construction.

4.4.2 Foundations for Canopies and Free-Standing Poles

We understand that the arena located at the east portion of the site will be covered by a canopy supported by canopy pole foundations. No foundation loads have been provided to us at the time of this report, however, due to potential uplift and lateral loads associated with the canopy foundations, it is our experience that Cast-In-Drilled Hole (CIDH) concrete pile foundations are likely preferable to shallow foundations. This foundation system may also be utilized for free standing light poles or sign posts.

Based on the subsurface conditions encountered at the site, we anticipate the canopy pole foundations will primarily bear in the young alluvial deposits. Therefore, we recommend using Class 5 Material as defined by California Building Code, Table 1806.2, 2016 Edition. The presumptive values in Table 1806.2 provide a vertical foundation pressure of 1,500 psf and a lateral bearing pressure of 100 psf/ft. The recommended capacities for the canopy poles are presented in Table 6 below assuming a pile diameter of 18 and 24 inches. Should larger lateral capacities be required, larger diameter piles or deeper embedments may be utilized. The methodology presented in the 2016 CBC Section 1807.3 was used to evaluate the design capacities.

Table 6
Pole Foundation Design Capacities

Pile Diameter (inches)	Embedment Depth (ft.)	Moment (M_g) (kip-ft.)	Vertical Bearing Capacity (psf)	Cohesion (psf)
18	6	7.6	1,500	130
	8	18.1		
	10	35.3		
24	6	10.2		
	8	24.1		
	10	47.1		

Nearby excavations, temporary shoring, or retaining walls may impact the lateral resistance for the canopy pole foundations. Kleinfelder should be notified of any proposed improvements near the proposed canopy pole locations. Additional analyses may be required depending on distance and depth of the improvements.

4.5 CONCRETE SLAB-ON-GRADE FLOORS

Based on the encountered subsurface conditions, we recommend concrete slab-on-grade floors be supported on new structural fill (i.e. all existing undocumented fill soils and the upper 24 inches of alluvial soils have been completely removed and replaced with properly compacted structural fill). The fill should be moisture conditioned to about 3 percent above optimum, and compacted to at least 90 percent the relative compaction per ASTM D1557. Subgrade soil supporting floor slabs should be prepared in accordance with the recommendations in Section 4.2.6 of this report. We recommend a modulus of subgrade reaction, k , of 150 pci to be used in design of the floor slabs on approved, compacted subgrades.

Special precautions should be taken during the placement and curing of all concrete slabs. Excessive slump (high water-cement ratio) of the concrete and/or improper curing procedures used during either hot or cold weather conditions could lead to excessive shrinkage, cracking, or curling of the slabs. High water-cement ratio and/or improper curing may also greatly increase the water vapor permeability of concrete. We recommend that all concrete placement, joint spacing, and curing operations be performed in accordance with the recommended guidelines of the American Concrete Institute (ACI).

Floor slabs for enclosed structures such as restrooms should be underlain by at least 4 inches of clean, coarse sand or fine gravel to provide a capillary moisture break and uniform support to the slab. In cases where the floor may have a vapor/moisture sensitive covering (e.g. tile, linoleum, carpet, wood), may be in a humidity controlled environment, or may likely have one or both of these conditions in the future, we recommend a 10-mil visqueen vapor barrier be utilized between the prepared subgrade and the bottom of the floor slab.

4.6 EXTERIOR CONCRETE FLATWORK

Flatwork and exterior concrete should be supported on at least 12 inches of compacted, low to very low expansive engineered fill. Particles in excess of 3 inches within the upper 12 inches of the subgrade should be removed. The concrete slabs for walkways and sidewalks should have a nominal thickness of 4 inches. The exposed subgrades should scarified to a depth of 6 inches, uniformly moisture conditioned to between optimum and 3 percent above optimum moisture content, and compacted to at least 95 percent relative compaction as per ASTM D1557. Loose or yielding subgrade identified during earthwork operations may require additional remedial measures. Positive drainage should be established and maintained adjacent to flatwork.

4.7 PRELIMINARY CORROSIVE SOIL SCREENING

Preliminary laboratory corrosive soil screening of the on-site soils was performed on a near surface sample from boring B-2 to evaluate the potential effect on concrete and ferrous metals. The results of the testing are presented in Appendix B and indicate a minimum resistivity of 1,900 ohm-cm, a pH value of 8.7, a sulfate concentration of 110 ppm, and a chloride concentration of 43 ppm.

The minimum electrical resistivity tests performed indicated that the soil is considered to be corrosive to buried unprotected metal objects based on the 1984 National Association of Corrosion Engineers (NACE) correlation between soil resistivity and corrosivity towards unprotected ferrous metals presented in Table 7.

Table 7
Electrical Resistivity and Unprotected Ferrous Metals Corrosion Potential

Minimum Electrical Resistivity, ohm-cm	Corrosion Potential
0 to 1,000	Severely Corrosive
1,000 to 2,000	Corrosive
2,000 – 10,000	Moderately Corrosive
Over 10,000	Mildly Corrosive

In general, Caltrans considers the subsurface conditions at a site to be aggressive to below-grade concrete if one or more of the following conditions exist for the representative soil samples taken at the site: chloride concentration is 500 parts per million (ppm) or greater, sulfate concentration is 2,000 ppm or greater, or the pH is 5.5 or less.

The Portland Cement Association (1988), correlates sulfate content to sulfate attack potential as presented in Table 8.

Table 8
Sulfate Attack Potential

Sulfate Content (ppm)	Sulfate Attack Potential
0 to 1,000	Negligible
1,000 to 2,000	Moderate
2,000 – 20,000	Severe
Over 20,000	Very Severe

Based on the Caltrans and Portland Cement Association criteria, the onsite soils may be considered to have a negligible sulfate attack potential and are considered to be not aggressive to below-grade concrete. Based on these test results, Type II cement may be suitable for design of concrete elements.

Preliminary corrosion tests are only an indicator of potential soil aggressivity for the sample tested. We recommend that the corrosion test results be reviewed and evaluated by the project designers considering the proposed improvements and project lifespan requirements. Kleinfelder does not practice corrosion engineering and the purpose of our tests is only to provide a preliminary screening. Additional sampling and testing may be performed after completion of grading for the proposed site improvements. A qualified corrosion engineer should be contacted for detailed evaluation of corrosion potential with respect to construction materials at this site and the proposed design.

5 LIMITATIONS

This report has been prepared for the exclusive use of San Diego County Department of Parks and Recreation and their consultants for specific application to the subject project. The findings, conclusions, and recommendations presented in this report were prepared in accordance with generally accepted geotechnical engineering practice. No warranty, express, or implied is made.

The scope of services was limited to the field exploration program described in this report. It should be recognized that definition and evaluation of subsurface conditions are difficult. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. The conclusions presented herein are based on field explorations, laboratory testing, engineering analyses, and professional judgement.

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining levels of service, which provide information for their purposes at acceptable levels of risk. The client and their consultants should discuss the issues addressed in this report with Kleinfelder, so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk, and expectations for future performance and maintenance.

Recommendations contained in this report are based on our field observations and subsurface explorations, laboratory tests, and our understanding of the proposed construction. It is possible that soil or groundwater conditions could vary between or beyond the points explored. If soil or groundwater conditions are encountered during construction that differ from those described herein, the client is responsible for ensuring that Kleinfelder is notified immediately so that we may re-evaluate the recommendations of this report. If the scope of the proposed construction or locations of the improvements change from those described in this report, then the conclusions and recommendations contained in this report are not considered valid until the changes are reviewed and the conclusions of this report are modified or approved in writing by Kleinfelder.

Our geotechnical scope of services for this subsurface exploration and geotechnical report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this site. Kleinfelder cannot be responsible for interpretation by others of this report or the conditions

encountered in the field. Kleinfelder must be retained so that all geotechnical aspects of construction can be monitored on a full-time basis by a representative from Kleinfelder, including site preparation, preparation of foundations, and placement of engineered fill and trench backfill. These services provide Kleinfelder the opportunity to observe the actual soil and groundwater conditions encountered during construction and to evaluate the applicability of the recommendations presented in this report to the site conditions. If Kleinfelder is not retained to provide these services, we will cease to be the engineer of record for this project and will assume no responsibility for any potential claim during or after construction on this project. If changed site conditions affect the recommendations presented herein, Kleinfelder must also be retained to perform a supplemental evaluation and to issue a revision to our original report.

This report, and any future addenda or reports regarding this site, may be made available to bidders to supply them with only the data contained in the report regarding subsurface conditions and laboratory test results at the point and time noted. Bidders may not rely on interpretations, opinion, recommendations, or conclusions contained in the report. Due to the limited nature of any subsurface study, the contractor may encounter conditions during construction which differ from those presented in this report. In such event, the contractor should promptly notify the owner so that Kleinfelder's geotechnical engineer can be contacted to confirm those conditions. We recommend the contractor describe the nature and extent of the differing conditions in writing and that the construction contract include provisions for dealing with differing conditions. Contingency funds should be reserved for potential problems during earthwork and foundation construction.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance, but in no event later than one year from the date of the report. Land use, site conditions, or other factors may change over time, and additional work may be required with the passage of time. Any party, other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of this report and the nature of the new project, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

Kleinfelder will assume no responsibility or liability whatsoever for any claim, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials. Additional important information about this report is presented in the attached Geotechnical Business Council insert in Appendix D.

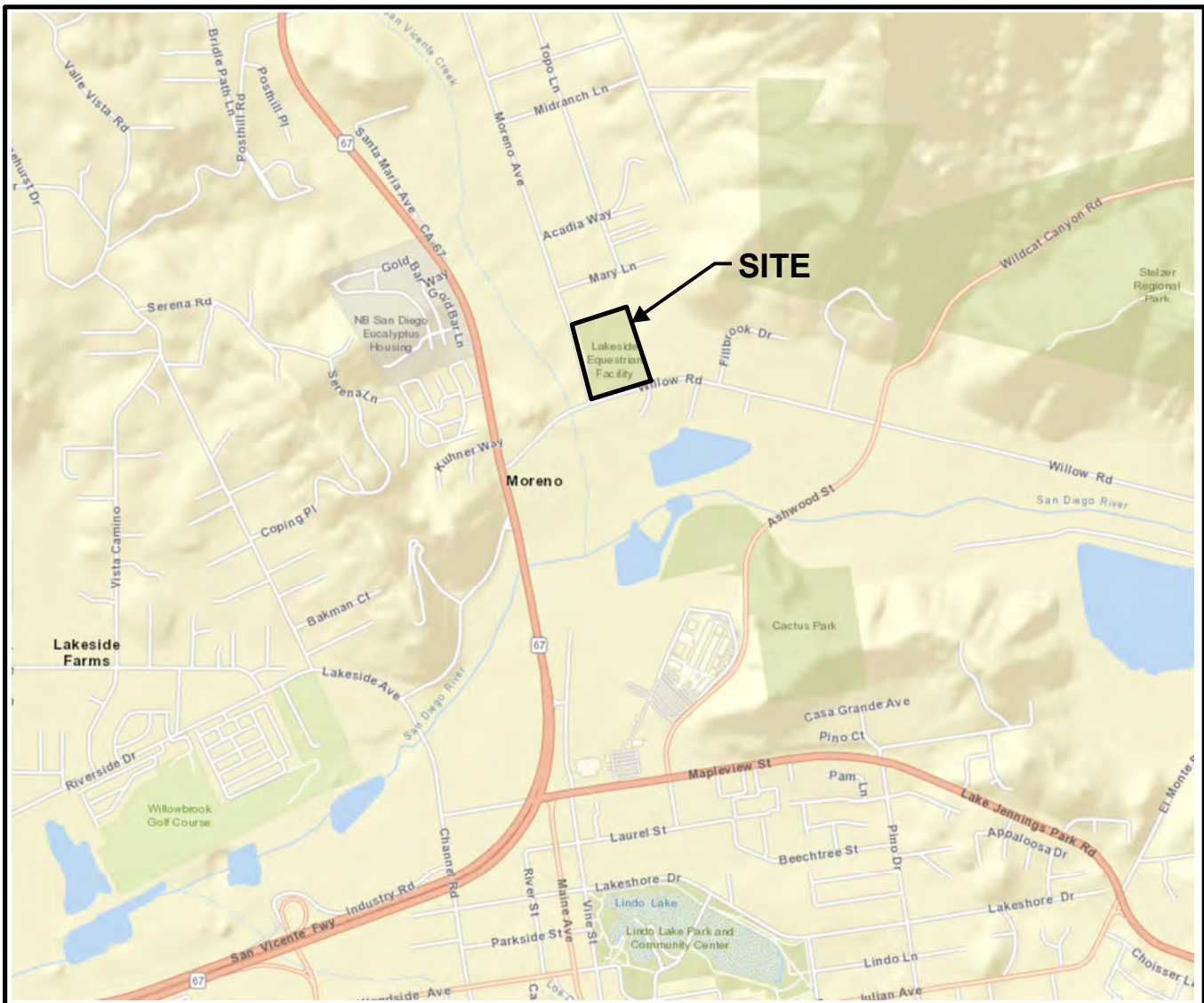
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FIGURES

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PROJECT NO.	20180057
DRAWN:	6/5/2017
DRAWN BY:	JP
CHECKED BY:	JB
FILE NAME:	20180057_vic.mxd

SITE VICINITY MAP

LAKESIDE EQUESTRIAN FACILITY
SAN DIEGO COUNTY PARKS AND RECREATION
WILLOW ROAD AND MORENO AVENUE
LAKESIDE, CALIFORNIA

FIGURE




1

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LEGEND

-  APPROXIMATE LOCATION OF PERCOLATION TEST
-  APPROXIMATE LOCATION OF SOIL BORING
-  APPROXIMATE LOCATION OF TEST PIT



PROJECT NO. 20180057
DRAWN: 6/5/2017
DRAWN BY: JP
CHECKED BY: JB
FILE NAME:
20180057_SITE.mxd

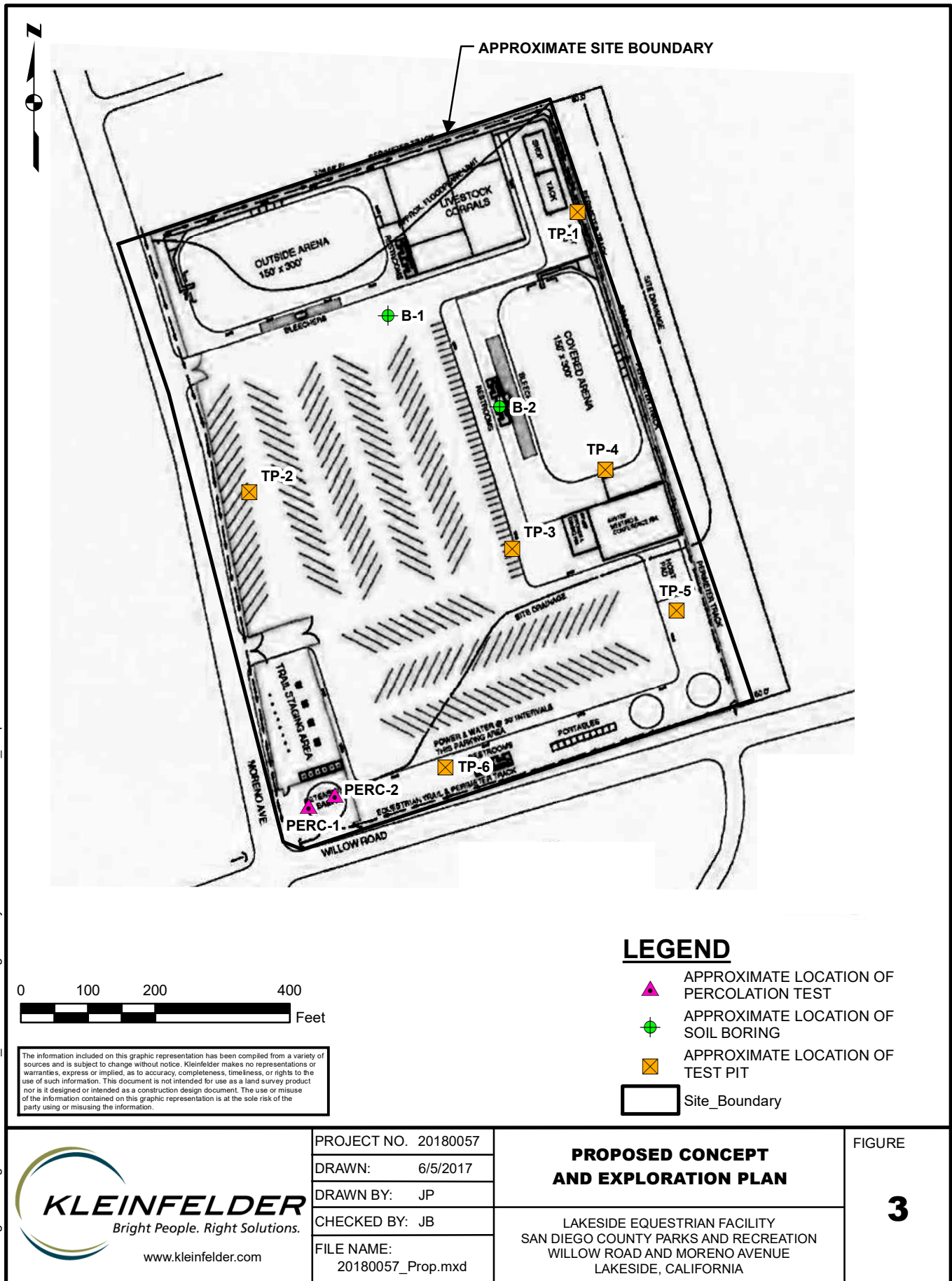
EXISTING SITE CONDITIONS AND EXPLORATION PLAN

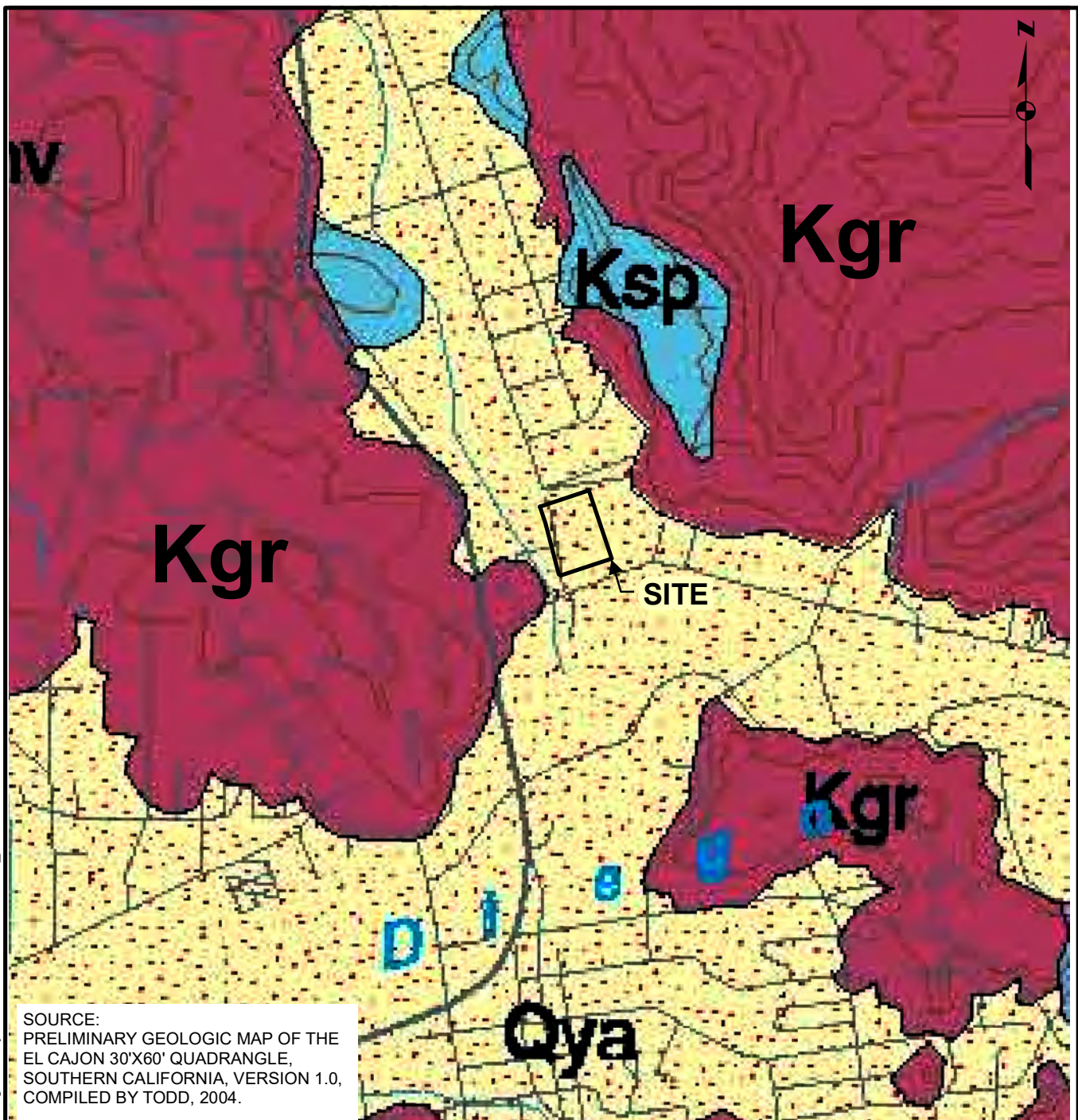
LAKESIDE EQUESTRIAN FACILITY
SAN DIEGO COUNTY PARKS AND RECREATION
WILLOW ROAD AND MORENO AVENUE
LAKESIDE, CALIFORNIA

FIGURE

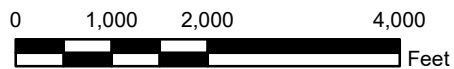
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




SOURCE:
PRELIMINARY GEOLOGIC MAP OF THE
EL CAJON 30'X60' QUADRANGLE,
SOUTHERN CALIFORNIA, VERSION 1.0,
COMPILED BY TODD, 2004.



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LEGEND

-  Qya - YOUNG ALLUVIUM (HOLOCENE)
-  Kgr - GRANITOID ROCKS (EARLY CRETACEOUS)
-  Ksp - SANTIAGO PEAK VOLCANICS (EARLY CRETACEOUS)



PROJECT NO.	20180057
DRAWN:	6/5/2017
DRAWN BY:	JP
CHECKED BY:	JB
FILE NAME:	20180057_GEO.mxd

REGIONAL GEOLOGIC MAP

LAKESIDE EQUESTRIAN FACILITY
SAN DIEGO COUNTY PARKS AND RECREATION
WILLOW ROAD AND MORENO AVENUE
LAKESIDE, CALIFORNIA

FIGURE

4

APPENDIX A

FIELD INVESTIGATION LOGS

APPENDIX A

FIELD INVESTIGATION LOGS

Two borings, seven test pits, and two percolation tests were performed on April 6 and 7, 2017. The approximate investigation locations were determined by measuring from existing site features and are shown on the attached Figures 1 and 2.

The borings, designated as B-1 and B-2, and percolation tests, designated as PERC-1 and PERC-2, were drilled by Pacific Drilling on April 6, 2017. Boreholes were advanced to termination depths of 20 feet below ground surface using a Fraste Multidrill drill rig equipped with 8-inch outer-diameter hollow-stem augers. The percolation tests were each installed at a depth of 5 feet below existing ground surface and offset boreholes were completed at each location to a depth of 10 feet below grade. Our typical vertical sampling interval was approximately five feet. The number of blows required to drive the Modified California sampler was recorded at each sampling location. The samplers and associated rods (threaded) were driven using a 140-pound automatic hammer falling 30 inches. The blow count for each 6-inch interval is recorded on the boring logs. The total number of hammer blows required to drive the SPT sampler the final 12 inches is termed the blow count (or N-value). The blow count values on the boring logs are presented as field values and have not been corrected for the effects such as overburden pressure, sampler size, hammer efficiency, etc.

The test pit excavations, designated as TP-1 through TP-6, were performed on April 6, 2017 by Cut 'n Core using a CAT 430F2 backhoe excavator. The test pits were completed to depths ranging from 2 to 5 feet below ground surface. TP-4 was terminated early due to an encountered obstruction and an offset test pit was performed as TP-4A.

The boreholes and test pits were backfilled using the soil cuttings or excavated soil upon completion of the exploration. An engineer from our office supervised the field operations and logged the borings, percolation tests, and test pits according to the Unified Soil Classification System (USCS). The USCS Soil Classification Chart and key to logs are included as Figures A-1 and A-2. The logs for borings B-1 and B-2 and percolation tests PERC-1 and PERC-2 are included as Figures A-3 through A-6. The logs for test pits TP-1 through TP-6 are included as Figures A-7 through A-13. The boundaries shown between soil types on the logs are approximate as the transition between different soil layers may be gradual. Therefore, variations in the subsurface profile should be anticipated throughout the site. Selected bulk and intact samples were retrieved from the borings and test pits, sealed, and transported to our laboratory for further evaluation and testing

SAMPLER AND DRILLING METHOD GRAPHICS

	BULK / GRAB / BAG SAMPLE
	MODIFIED CALIFORNIA SAMPLER (2 or 2-1/2 in. (50.8 or 63.5 mm.) outer diameter)
	CALIFORNIA SAMPLER (3 in. (76.2 mm.) outer diameter)
	STANDARD PENETRATION SPLIT SPOON SAMPLER (2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)
	HQ CORE SAMPLE (2.500 in. (63.5 mm.) core diameter)
	SHELBY TUBE SAMPLER
	HOLLOW STEM AUGER
	SOLID STEM AUGER
	WASH BORING
	SONIC CONTINUOUS SAMPLER

GROUND WATER GRAPHICS

	WATER LEVEL (level where first observed)
	WATER LEVEL (level after exploration completion)
	WATER LEVEL (additional levels after exploration)
	OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual or differ from those shown.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, ie., GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.

ABBREVIATIONS

WOH - Weight of Hammer
 WOR - Weight of Rod

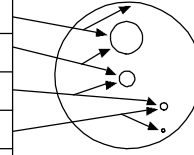
UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

GRAVELS (More than half of coarse fraction is larger than the #200 sieve)	CLEAN GRAVEL WITH <5% FINES	Cu ≥ 4 and 1 ≤ Cc ≤ 3		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		Cu < 4 and/or 1 > Cc > 3		GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
	GRAVELS WITH 5% TO 12% FINES	Cu ≥ 4 and 1 ≤ Cc ≤ 3		GW-GM	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GW-GC	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
		Cu < 4 and/or 1 > Cc > 3		GP-GM	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GP-GC	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
	GRAVELS WITH > 12% FINES			GM	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
				GC-GM	CLAYEY GRAVELS, GRAVEL-SAND-CLAY-SILT MIXTURES
SANDS (More than half of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH <5% FINES	Cu ≥ 6 and 1 ≤ Cc ≤ 3		SW	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		Cu < 6 and/or 1 > Cc > 3		SP	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
	SANDS WITH 5% TO 12% FINES	Cu ≥ 6 and 1 ≤ Cc ≤ 3		SW-SM	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SW-SC	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
		Cu < 6 and/or 1 > Cc > 3		SP-SM	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SP-SC	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
	SANDS WITH > 12% FINES			SM	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES
				SC-SM	CLAYEY SANDS, SAND-SILT-CLAY MIXTURES
FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid Limit less than 50)			ML	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				CL-ML	INORGANIC CLAYS-SILTS OF LOW PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
	SILTS AND CLAYS (Liquid Limit greater than 50)			OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
				MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY

 KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 20180057	GRAPHICS KEY Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	FIGURE
	DRAWN BY: JLB CHECKED BY: KC DATE: 4/13/2017 REVISED: -		A-1

GRAIN SIZE

DESCRIPTION	SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders	>12 in. (304.8 mm.)	>12 in. (304.8 mm.)	Larger than basketball-sized
Cobbles	3 - 12 in. (76.2 - 304.8 mm.)	3 - 12 in. (76.2 - 304.8 mm.)	Fist-sized to basketball-sized
Gravel	coarse 3/4 - 3 in. (19 - 76.2 mm.)	3/4 - 3 in. (19 - 76.2 mm.)	Thumb-sized to fist-sized
	fine #4 - 3/4 in. (#4 - 19 mm.)	0.19 - 0.75 in. (4.8 - 19 mm.)	Pea-sized to thumb-sized
Sand	coarse #10 - #4	0.075 - 0.19 in. (2 - 4.9 mm.)	Rock salt-sized to pea-sized
	medium #40 - #10	0.017 - 0.075 in. (0.43 - 2 mm.)	Sugar-sized to rock salt-sized
	fine #200 - #40	0.0029 - 0.017 in. (0.07 - 0.43 mm.)	Flour-sized to sugar-sized
Fines	Passing #200	<0.0029 in. (<0.07 mm.)	Flour-sized and smaller

**SECONDARY CONSTITUENT**

	AMOUNT	
Term of Use	Secondary Constituent is Fine Grained	Secondary Constituent is Coarse Grained
Trace	<5%	<15%
With	≥5 to <15%	≥15 to <30%
Modifier	≥15%	≥30%

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

CONSISTENCY - FINE-GRAINED SOIL

CONSISTENCY	SPT - N ₆₀ (# blows / ft)	Pocket Pen (tsf)	UNCONFINED COMPRESSIVE STRENGTH (Q _u)(psf)	VISUAL / MANUAL CRITERIA
Very Soft	<2	PP < 0.25	<500	Thumb will penetrate more than 1 inch (25 mm). Extrudes between fingers when squeezed.
Soft	2 - 4	0.25 ≤ PP < 0.5	500 - 1000	Thumb will penetrate soil about 1 inch (25 mm). Remolded by light finger pressure.
Medium Stiff	4 - 8	0.5 ≤ PP < 1	1000 - 2000	Thumb will penetrate soil about 1/4 inch (6 mm). Remolded by strong finger pressure.
Stiff	8 - 15	1 ≤ PP < 2	2000 - 4000	Can be imprinted with considerable pressure from thumb.
Very Stiff	15 - 30	2 ≤ PP < 4	4000 - 8000	Thumb will not indent soil but readily indented with thumbnail.
Hard	>30	4 ≤ PP	>8000	Thumbnail will not indent soil.

FROM TERZAGHI AND PECK, 1948; LAMBE AND WHITMAN, 1969; FHWA, 2002; AND ASTM D2488

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPT-N ₆₀ (# blows/ft)	MODIFIED CA SAMPLER (# blows/ft)	CALIFORNIA SAMPLER (# blows/ft)	RELATIVE DENSITY (%)
Very Loose	<4	<4	<5	0 - 15
Loose	4 - 10	5 - 12	5 - 15	15 - 35
Medium Dense	10 - 30	12 - 35	15 - 40	35 - 65
Dense	30 - 50	35 - 60	40 - 70	65 - 85
Very Dense	>50	>60	>70	85 - 100

FROM TERZAGHI AND PECK, 1948

STRUCTURE

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. thick, note thickness.
Laminated	Alternating layers of varying material or color with the layer less than 1/4-in. thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.

REACTION WITH HYDROCHLORIC ACID

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

PLASTICITY

DESCRIPTION	LL	FIELD TEST
Non-plastic	NP	A 1/8-in. (3 mm.) thread cannot be rolled at any water content.
Low (L)	< 30	The thread can barely be rolled and the lump or thread cannot be formed when drier than the plastic limit.
Medium (M)	30 - 50	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump or thread crumbles when drier than the plastic limit.
High (H)	> 50	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump or thread can be formed without crumbling when drier than the plastic limit.

ANGULARITY

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.



PROJECT NO.: 20180057
DRAWN BY: JLB
CHECKED BY: KC
DATE: 4/13/2017
REVISED: -


SOIL DESCRIPTION KEY

Lakeside Equestrian Facility
Willow Rd and Moreno Ave
Lakeside, California


FIGURE

A-2

PLOTTED: 06/05/2017 09:59 AM BY: JBonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180057.001A
GINT FILE: KLF_gint_master_2017
GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End: 4/06/2017		Drilling Company: Pacific Drilling		BORING LOG B-1											
Logged By: J. Bonfiglio		Drill Crew: Carlos & Rory													
Hor.-Vert. Datum: Not Available - MSL		Drilling Equipment: Fraste Multidrill XL		Hammer Type - Drop: 140 lb. Auto - 30 in.											
Plunge: -90 degrees		Drilling Method: Hollow Stem Auger													
Weather: Sunny		Exploration Diameter: 8 in. O.D.													
Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 412.50 Surface Condition: Bare Earth and Grass	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks	
			Lithologic Description												
			Young Alluvial Deposits (Qya) Poorly graded SAND with Silt (SP-SM): fine to medium-grained sand, trace clay, low plasticity, very dark brown (7.5YR-2.5/3), moist						8.4		100	5.6	31	7	Augered to 5 ft; easy augering Bulk sample S1 at 1-5 ft
410															
	5		Sandy SILT (ML): fine to coarse-grained sand, micaceous, low plasticity, strong brown (7.5YR-3/4), moist, soft	BC=4 6 6 PP=0.5	14"				5.4	97.3					MCAL sample 5 to 6.5 ft Direct Shear= Peak Cohesion: 179 psf Peak Friction Angle: 37.0° Augered to 10 ft
405															
	10		Sandy SILT (ML): fine to coarse-grained sand, micaceous, low plasticity, strong brown (7.5YR-3/4), moist, stiff	BC=3 5 8 PP=1.75	14"						99	55			MCAL sample 10 to 11.5 ft Augered to 15 ft
400															
	15		SILT (ML): trace fine-grained sand, micaceous, low plasticity, strong brown (7.5YR-3/4), moist, very stiff	BC=3 4 6 PP=2.25	10"										MCAL sample 15 to 16.5 ft Augered to 18.5 ft
395															
	20		SILT (ML): trace fine-grained sand, trace clay, micaceous, low plasticity, strong brown (7.5YR-3/4), moist, very stiff	BC=2 3 4 PP=2	14"										MCAL sample 18.5 to 20 ft
390			The boring was terminated at approximately 20 ft. below ground surface. The boring was backfilled with auger cuttings on April 06, 2017.				GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during drilling or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.								
			PROJECT NO.: 20180057		BORING LOG B-1						FIGURE A-3				
			DRAWN BY: JLB												
			CHECKED BY: KC		Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California										
			DATE: 4/13/2017												
REVISED: -								PAGE: 1 of 1							

PLOTTED: 06/05/2017 10:00 AM BY: J.Bonfiglio
OFFICE FILTER: SAN DIEGO
PROJECT NUMBER: 20180057.001A
GINT FILE: KLF_gint_master_2017
GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End: 4/06/2017		Drilling Company: Pacific Drilling		BORING LOG B-2										
Logged By: J. Bonfiglio		Drill Crew: Carlos & Rory												
Hor.-Vert. Datum: Not Available - MSL		Drilling Equipment: Fraste Multidrill XL		Hammer Type - Drop: 140 lb. Auto - 30 in.										
Plunge: -90 degrees		Drilling Method: Hollow Stem Auger												
Weather: Sunny		Exploration Diameter: 8 in. O.D.												
Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS							
			Approximate Ground Surface Elevation (ft.): 412.00 Surface Condition: Bare Earth and Grass	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Lithologic Description											
			Young Alluvial Deposits (Qya) Sandy SILT (ML): fine to medium-grained sand, trace clay, low plasticity, very dark brown (7.5YR-2.5/3), moist											Augered to 5 ft; easy augering Bulk sample S1 at 1-5 ft
410														
	5		Sandy SILT (ML): fine to medium-grained sand, trace clay, low plasticity, very dark brown (7.5YR-2.5/3), moist, medium stiff		BC=8 16 20 PP=0.5 PP=2.0	15"			5.5	95.6				MCAL sample 5 to 6.5 ft
405			Sandy SILT (ML): fine to medium-grained sand, low plasticity, brown (10YR-4/3), moist, very stiff											Direct Shear= Peak Cohesion: 373 psf Peak Friction Angle: 28.5° Expansion Index= 5 Augered to 10 ft
	10													MCAL sample 10 to 11.5 ft
400			SILT (ML): trace fine to medium-grained sand, trace clay, micaceous, low plasticity, very dark brown (7.5YR-2.5/3), moist, soft		BC=6 6 7 PP=0.25	14"								Augered to 15 ft
	15													MCAL sample 15 to 16.5 ft
395			SILT (ML): trace fine to medium-grained sand, trace to some clay, micaceous, low to medium plasticity, very dark brown (7.5YR-2.5/3), moist, medium stiff		BC=5 6 7 PP=0.5	14"			19.3	80.9				Augered to 18.5 ft
	20													MCAL sample 18.5 to 20 ft
			SILT (ML): trace fine to medium-grained sand, trace clay, micaceous, low to medium plasticity, very dark brown (7.5YR-2.5/3), moist, medium stiff		BC=3 4 4 PP=0.5	14"								
390			The boring was terminated at approximately 20 ft. below ground surface. The boring was backfilled with auger cuttings on April 06, 2017.				GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during drilling or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.							
			PROJECT NO.: 20180057		BORING LOG B-2								FIGURE A-4	
			DRAWN BY: JLB											
			CHECKED BY: KC		Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California									
			DATE: 4/13/2017											
REVISED: -												PAGE: 1 of 1		


PLOTTED: 06/05/2017 10:00 AM BY: JBonfiglio


OFFICE FILTER: SAN DIEGO

PROJECT NUMBER: 20180057.001A
KLF_BORING/TEST PIT SOIL LOG

gint FILE: KLF_gint_master_2017
gint TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB


Date Begin - End: 4/06/2017	Drilling Company: Pacific Drilling	BORING LOG PERC-1
Logged By: J. Bonfiglio	Drill Crew: Carlos & Rory	
Hor.-Vert. Datum: Not Available - MSL	Drilling Equipment: Fraste Multidrill XL	
Plunge: -90 degrees	Drilling Method: Hollow Stem Auger	
Weather: Sunny	Exploration Diameter: 8 in. O.D.	
Hammer Type - Drop: 140 lb. Auto - 30 in.		

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 410.00 Surface Condition: Bare Earth and Grass	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks	
			Lithologic Description												
405	5		<u>Artificial Fill (af)</u> Silty SAND (SM): fine to medium-grained sand, low plasticity, strong brown (7.5YR-3/4), moist											Augered to 5 ft; easy augering Bulk sample S1 at 1-5 ft	
			<u>Young Alluvial Deposits (Qya)</u> Silty SAND (SM): fine to medium-grained sand, micaceous, non-plastic, strong brown (7.5YR-3/4), moist, very loose	BC=2 1 1	13"				100	29			MCAL sample 5 to 6.5 ft Augered to 10 ft		
			<u>Poorly graded SAND with Silt (SP-SM):</u> fine to medium-grained sand, micaceous, non-plastic, light olive brown (2.5YR-5/3), moist, medium dense	BC=3 5 5	18"								MCAL sample 10 to 11.5 ft		
395	15	The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on April 06, 2017.													
390	20	<u>GROUNDWATER LEVEL INFORMATION:</u> Groundwater was not observed during drilling or after completion. <u>GENERAL NOTES:</u> The exploration location and elevation are approximate and were estimated by Kleinfelder.													

	PROJECT NO.: 20180057	BORING LOG PERC-1	FIGURE A-5
	DRAWN BY: JLB		
	CHECKED BY: KC	Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	
DATE: 4/13/2017			
REVISED: -			PAGE: 1 of 1

Date Begin - End: 4/06/2017		Drilling Company: Pacific Drilling		BORING LOG PERC-2									
Logged By: J. Bonfiglio		Drill Crew: Carlos & Rory											
Hor.-Vert. Datum: Not Available - MSL		Drilling Equipment: Fraste Multidrill XL		Hammer Type - Drop: 140 lb. Auto - 30 in.									
Plunge: -90 degrees		Drilling Method: Hollow Stem Auger											
Weather: Sunny		Exploration Diameter: 8 in. O.D.											

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 411.00 Surface Condition: Bare Earth and Grass	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks	
															Lithologic Description
410			Artificial Fill (af) Sandy SILT (ML): fine to medium-grained sand, micaceous, low plasticity, very dark brown (7.5YR-2.5/2), moist												Augered to 5 ft; easy augering Bulk sample S1 at 1-5 ft
5			Young Alluvial Deposits (Qya) Poorly graded SAND with Silt (SP-SM): fine to medium-grained sand, micaceous, non-plastic, light olive brown (2.5YR-5/3), moist, loose	BC=2 1 1	13"					100	5.6				MCAL sample 5 to 6.5 ft Augered to 10 ft
405			Poorly graded SAND with Silt (SP-SM): fine to medium-grained sand, micaceous, non-plastic, light olive brown (2.5YR-5/3), moist, medium dense	BC=3 5 5	18"										MCAL sample 10 to 11.5 ft
400			<p>The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on April 06, 2017.</p> <p>GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during drilling or after completion.</p> <p>GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.</p>												
15															
395															
20															
390															

	PROJECT NO.: 20180057	BORING LOG PERC-2	FIGURE
	DRAWN BY: JLB		
	CHECKED BY: KC	Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	A-6
	DATE: 4/13/2017		
REVISED: -			PAGE: 1 of 1

PLOTTED: 06/05/2017 10:00 AM BY: JBonfiglio

Date Begin - End: 4/06/2017	Excavation Company: Cut N Core	TEST PIT LOG TP-1
Logged By: T. Meier	Excavation Crew:	
Hor.-Vert. Datum: Not Available - MSL	Excavation Equip.: CAT Backhoe	
Plunge: N/A	Excav. Dimensions: 12 x 5 ft	
Weather: Sunny		

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION		LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 412.50 Surface Condition: Bare Earth and Grass		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
			Lithologic Description										
			<u>Young Alluvial Deposits (Qya)</u> Sandy SILT (ML): fine to medium-grained sand, micaceous, non-plastic to low plasticity, brown, dry to moist						100	59			

The test pit was terminated at approximately 5 ft. below ground surface.
The test pit was backfilled with excavated material on April 06, 2017.


GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.

GINT FILE: KLF_gint_master_2017
GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 20180057.001A
OFFICE FILTER: SAN DIEGO

PLOTTED: 06/05/2017 10:00 AM BY: JBonfiglio


Date Begin - End:	4/06/2017	Excavation Company:	Cut N Core	TEST PIT LOG TP-2
Logged By:	T. Meier	Excavation Crew:		
Hor.-Vert. Datum:	Not Available - MSL	Excavation Equip.:	CAT Backhoe	
Plunge:	N/A	Excav. Dimensions:	12 x 5 ft	
Weather:	Sunny			

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION		LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 412.00 Surface Condition: Bare Earth and Grass		Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks
			Lithologic Description										
-410			Young Alluvial Deposits (Qya) SILT with Sand (ML): fine to medium-grained sand, micaceous, non-plastic to low plasticity, light brown to brown, dry										
			-olive brown to dark brown, increasing moisture										
5													

The test pit was terminated at approximately 5 ft. below ground surface.
The test pit was backfilled with excavated material on April 06, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during excavation or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.

	PROJECT NO.: 20180057	TEST PIT LOG TP-2	FIGURE
	DRAWN BY: JLB		
	CHECKED BY: KC	Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	A-8
	DATE: 4/13/2017		
	REVISED: -		
			PAGE: 1 of 1

GINT FILE: KLF_gint_master_2017
GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 20180057.001A
OFFICE FILTER: SAN DIEGO

Drilling Company: Cut N Core

Drill Crew: _____

Drilling Equipment: CAT Backhoe

Drilling Method: _____

Exploration Diameter: 11 x 5 in.

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS							
			Approximate Ground Surface Elevation (ft.): 409.00 Surface Condition: Bare Earth and Grass	Sample Type	Blow Counts (EC)= Uncorr. Blows/6 In. Pocket Pen(PP)= 1sf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Lithologic Description											
		<p><u>Young Alluvial Deposits (Qya)</u></p> <p>Sandy SILT (ML): fine to medium-grained sand, brown, dry</p>												R-Value= 75
		<p>Silty SAND (SM): fine to coarse-grained sand, olive brown to dark brown, moist</p>												
405	5	<p>The boring was terminated at approximately 5 ft. below ground surface. The boring was backfilled with excavated material on April 06, 2017.</p>												
		<p><u>GROUNDWATER LEVEL INFORMATION:</u> Groundwater was not observed during drilling or after completion.</p> <p><u>GENERAL NOTES:</u> The exploration location and elevation are approximate and were estimated by Kleinfelder.</p>												
400	10													
395														



PROJECT NO.: 20180057
DRAWN BY: JLB
CHECKED BY: KC
DATE: 4/13/2017
REVISED: -

Lakeside Equestrian Facility
Willow Rd and Moreno Ave
Lakeside, California

A-9

PAGE: 1 of 1



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gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:KLF_STANDA



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PLOTTED: 06/05/2017 10:00 AM BY: JBonfiglio

Date Begin - End: 4/06/2017	Drilling Company: Cut N Core	BORING LOG TP-5
Logged By: T. Meier	Drill Crew:	
Hor.-Vert. Datum: Not Available - MSL	Drilling Equipment: CAT Backhoe	
Plunge: -90 degrees	Drilling Method:	
Weather: Sunny	Exploration Diameter: 9 x 5 in.	

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 412.00 Surface Condition: Bare Earth and Grass	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks	
															Lithologic Description
410			Young Alluvial Deposits (Qya) Sandy SILT (ML): fine to coarse-grained sand, non-plastic to low plasticity, olive brown, dry												
			Silty SAND (SM): fine to medium-grained sand, trace subangular gravel, micaceous, non-plastic, gray brown to dark brown, moist -medium-grained SAND lense at 4 ft												

The boring was terminated at approximately 5 ft. below ground surface. The boring was backfilled with excavated material on April 06, 2017.

GROUNDWATER LEVEL INFORMATION:

Groundwater was not observed during drilling or after completion.

GENERAL NOTES:

The exploration location and elevation are approximate and were estimated by Kleinfelder.



PROJECT NO.: 20180057
DRAWN BY: JLB
CHECKED BY: KC
DATE: 4/13/2017
REVISED: -

BORING LOG TP-5

Lakeside Equestrian Facility
Willow Rd and Moreno Ave
Lakeside, California

FIGURE

A-12

PLOTTED: 06/05/2017 10:00 AM BY: JBonfiglio


Date Begin - End: 4/06/2017	Drilling Company: Cut N Core	BORING LOG TP-6
Logged By: T. Meier	Drill Crew:	
Hor.-Vert. Datum: Not Available - MSL	Drilling Equipment: CAT Backhoe	
Plunge: -90 degrees	Drilling Method:	
Weather: Sunny	Exploration Diameter: 13 x 5 in.	

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 407.00 Surface Condition: Bare Earth and Grass		Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Lithologic Description												
405		<div><div><div>Artificial Fill (af)</div><div>Sandy SILT (ML): fine to coarse-grained sand, micaceous, non-plastic to low plasticity, olive brown, moist</div></div></div>	<div><div></div></div>												
		<div><div><div>Silty SAND with Gravel (SM): fine to coarse-grained sand, subangular gravel, trace boulders, trace debris (concrete, asphalt, plastic), olive brown, moist</div></div></div>	<div><div></div></div>												

The boring was terminated at approximately 5 ft. below ground surface. The boring was backfilled with excavated material on April 06, 2017.

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.

	PROJECT NO.: 20180057	BORING LOG TP-6 Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	FIGURE A-13
	DRAWN BY: JLB CHECKED BY: KC DATE: 4/13/2017 REVISED: -		

APPENDIX B

LABORATORY TEST RESULTS

APPENDIX B

LABORATORY TEST RESULTS

Laboratory tests were performed on selected bulk and drive samples from our borehole and test pit explorations to estimate engineering characteristics of the various earth materials encountered. Testing was performed in accordance with ASTM Standards for Soil Testing and are presented in herein.

CLASSIFICATION

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D2488. Soil classifications are indicated on the logs of the exploratory borings in Appendix A.

MOISTURE CONTENT AND DRY UNIT WEIGHT

Natural moisture content and dry unit weight tests were performed on selected drive samples collected from the boreholes in accordance with ASTM D2216 and D2937, respectively. The results are presented on the boring and test pit logs in Appendix A as Figures A-3 through A-13.

GRADATION ANALYSES

Five sieve analyses were performed on representative samples of the materials encountered at the site to evaluate the gradation characteristics of the soil and to aid in classification. The tests were performed in general accordance with ASTM Test Method D422. The results of the sieve analyses are presented on the boring and test pit logs in Appendix A as Figures A-3 through A-13 and in Appendix B on Figures B-1 through B-5.

ATTERBERG LIMITS

An Atterberg limits test was performed on a selected near-surface soil sample from boring B-1 to evaluate the plasticity characteristics (liquid limit, plastic limit, and plasticity index) of the soil and to aid in its classification. The test was performed in general accordance with ASTM Test Method D4318. The Atterberg limits test result is presented on the log for boring B-1 on Figure A-3 and in Appendix B on Figure B-6.

DIRECT SHEAR TEST

Two direct shear strength tests were performed on representative soil samples. One test was performed on a remolded sample and one test was performed on a drive sample. The test procedures were performed in general accordance with ASTM Test Method D3080. The test results are presented on Figures B-7 and B-8.

EXPANSION INDEX

An expansion index tests was performed on a representative soil sample of the alluvial deposits from boring B-2. The test procedures were performed in general accordance with ASTM Test Method D4829. The corrected expansion index of 5, presented on Figure B-9, may be compared to Table B-1 presented below to qualitatively evaluate the expansion potential of the near-surface site soils.

Table B-1
Expansion Index and Potential

Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

R-VALUE

An R-Value tests was performed on a representative soil sample to evaluate resistance value of the near surface soils. The tests were performed using modified effort in general accordance with ASTM Test Method D2844. The R-value test result in presented on Figure B-10.

MODIFIED PROCTOR

A modified proctor test was performed on a representative soil sample of the near surface soils to evaluate compaction characteristics. The test was performed in accordance with ASTM D1557 and the test result is given in Table B-2 and is included in Appendix B.

Table B-2
Modified Proctor Test Results

Sample	Depth (ft)	Maximum Dry Unit Weight (pcf)	Optimum Water Content (%)
B2-S1	1-5	122.9	11.8

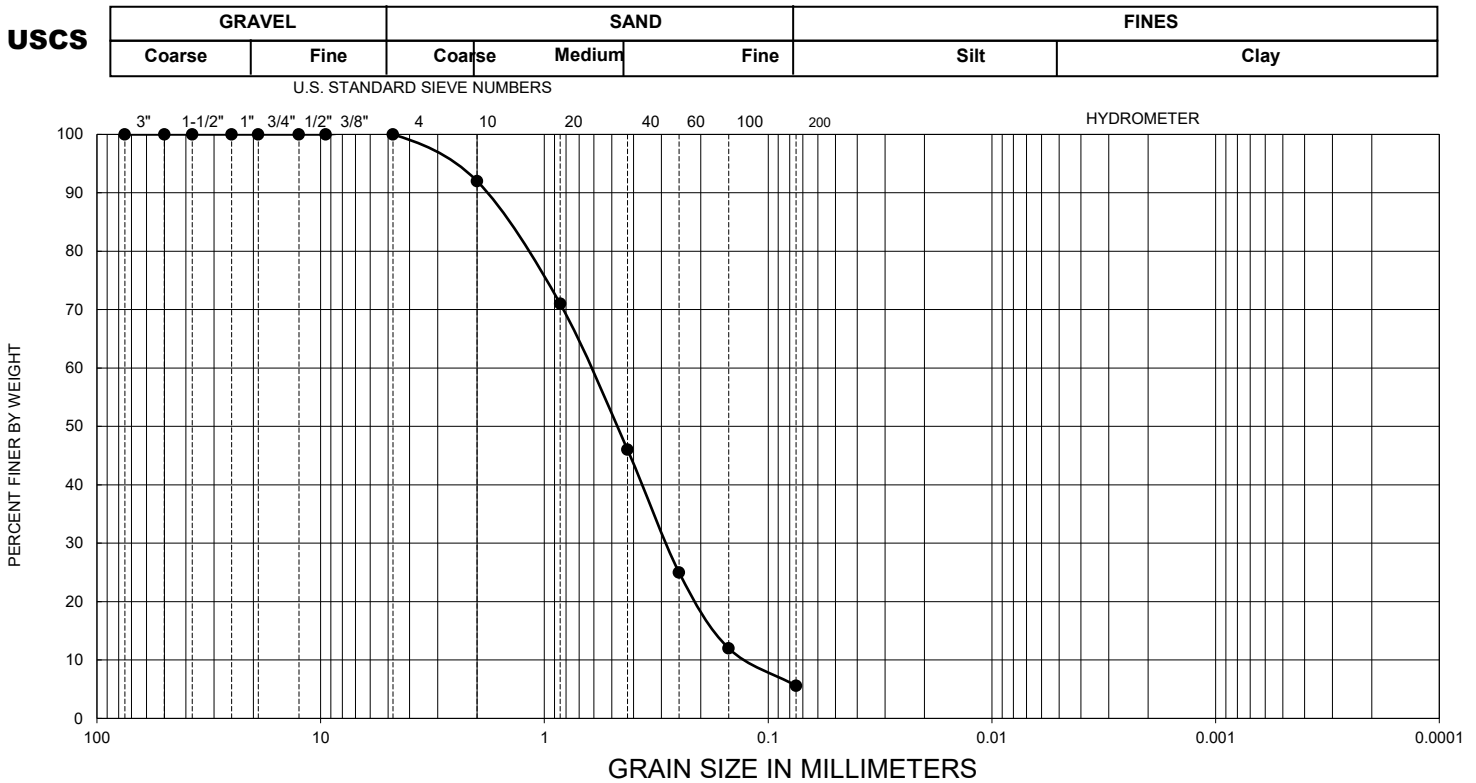
CORROSION TESTS

A series of chemical tests were performed on a representative sample of the near surface soils to estimate pH, resistivity, and sulfate and chloride contents. The test procedures were in general accordance with the California Tests 417, 422, and 643. The test results are presented in Table B-2 and are included in Appendix B.

Table B-3
Corrosion Test Results

Sample	Depth (ft)	pH	Sulfate (% by Wt)	Chloride (% by Wt)	Minimum Resistivity (ohm-cm)
B2-S1	1-5	8.7	0.011	0.004	1,900

Date Tested: 4/19/2017



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
B1	S1	1-5	5.6	SP-SM

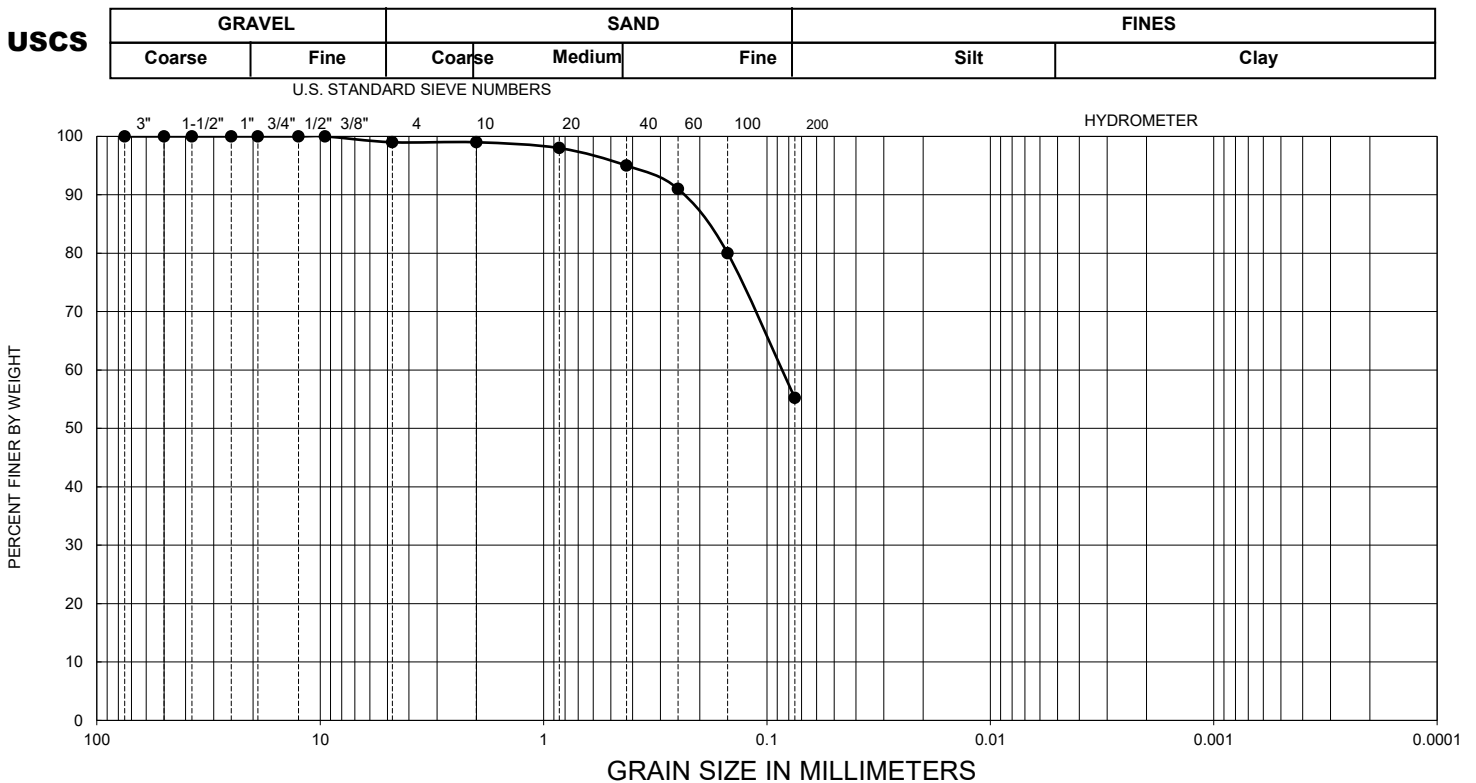
Sample Description	Brown Poorly graded sand with silt
--------------------	------------------------------------

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	92
	No. 20	0.85 mm	71
	No. 40	0.425 mm	46
	No. 60	0.25 mm	25
	No. 100	0.15 mm	12
	No. 200	.075 mm	5.6

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

	GRADATION TEST RESULTS		FIGURE	
	Lakeside Equestrian Facility Lakeside, CA		B-1	
Checked by:	JLB	Tech:	Uly P.	
Project No.	20180057.001A	Date:	5-Jun-17	

Date Tested: 4/19/2017



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
B1	S3	11-11.5	55.2	ML

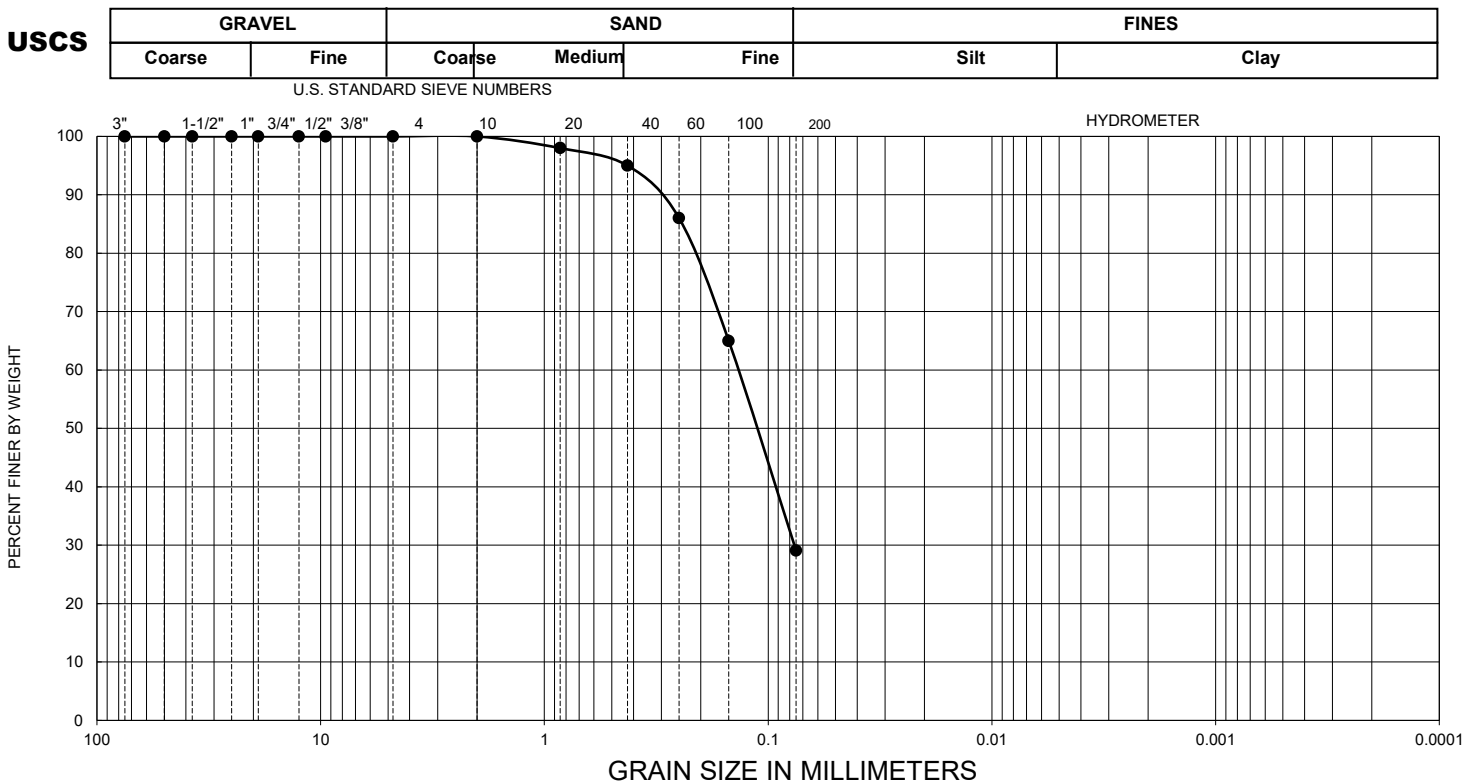
Sample Description	Dark brown Sandy silt
--------------------	-----------------------

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	99
	No. 10	2.0 mm	99
	No. 20	0.85 mm	98
	No. 40	0.425 mm	95
	No. 60	0.25 mm	91
	No. 100	0.15 mm	80
	No. 200	.075 mm	55.2

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

	GRADATION TEST RESULTS		FIGURE	
	Lakeside Equestrian Facility Lakeside, CA		B-2	
Checked by:	JLB	Tech:	Uly P.	
Project No.	20180057.001A	Date:	5-Jun-17	

Date Tested: 4/19/2017



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
Perc-1	S2	6-6.5	29.1	SM

Sample Description	Brown Silty sand
--------------------	------------------

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	98
	No. 40	0.425 mm	95
	No. 60	0.25 mm	86
	No. 100	0.15 mm	65
	No. 200	.075 mm	29.1

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913

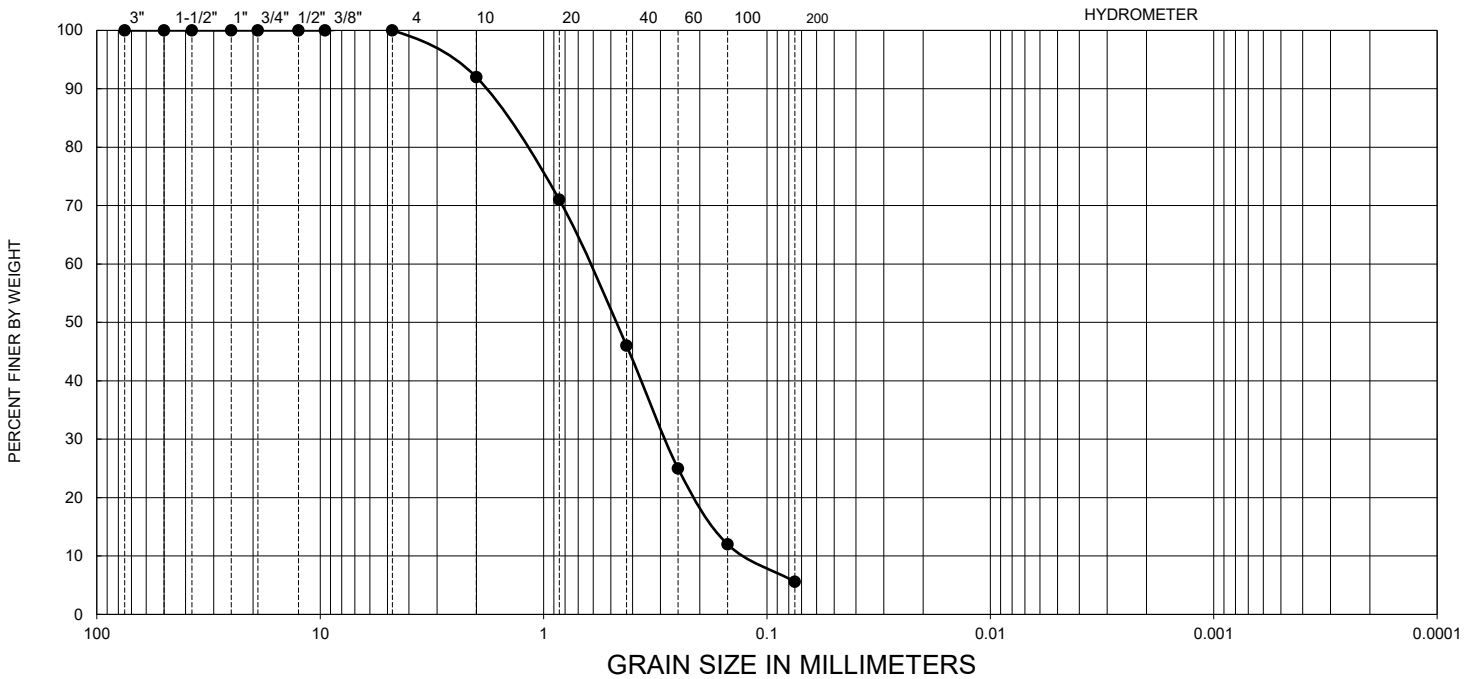
	GRADATION TEST RESULTS		FIGURE
	Lakeside Equestrian Facility Lakeside, CA		B-3
Checked by:	JLB	Tech:	Uly P.
Project No.	20180057.001A	Date:	5-Jun-17

Date Tested: 4/19/2017

USCS

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

U.S. STANDARD SIEVE NUMBERS



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
Perc-2	S2	6-6.5	5.6	SP-SM

Sample Description	Brown Poorly graded sand with silt
--------------------	------------------------------------

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	92
	No. 20	0.85 mm	71
	No. 40	0.425 mm	46
	No. 60	0.25 mm	25
	No. 100	0.15 mm	12
	No. 200	.075 mm	5.6

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913



GRADATION TEST RESULTS

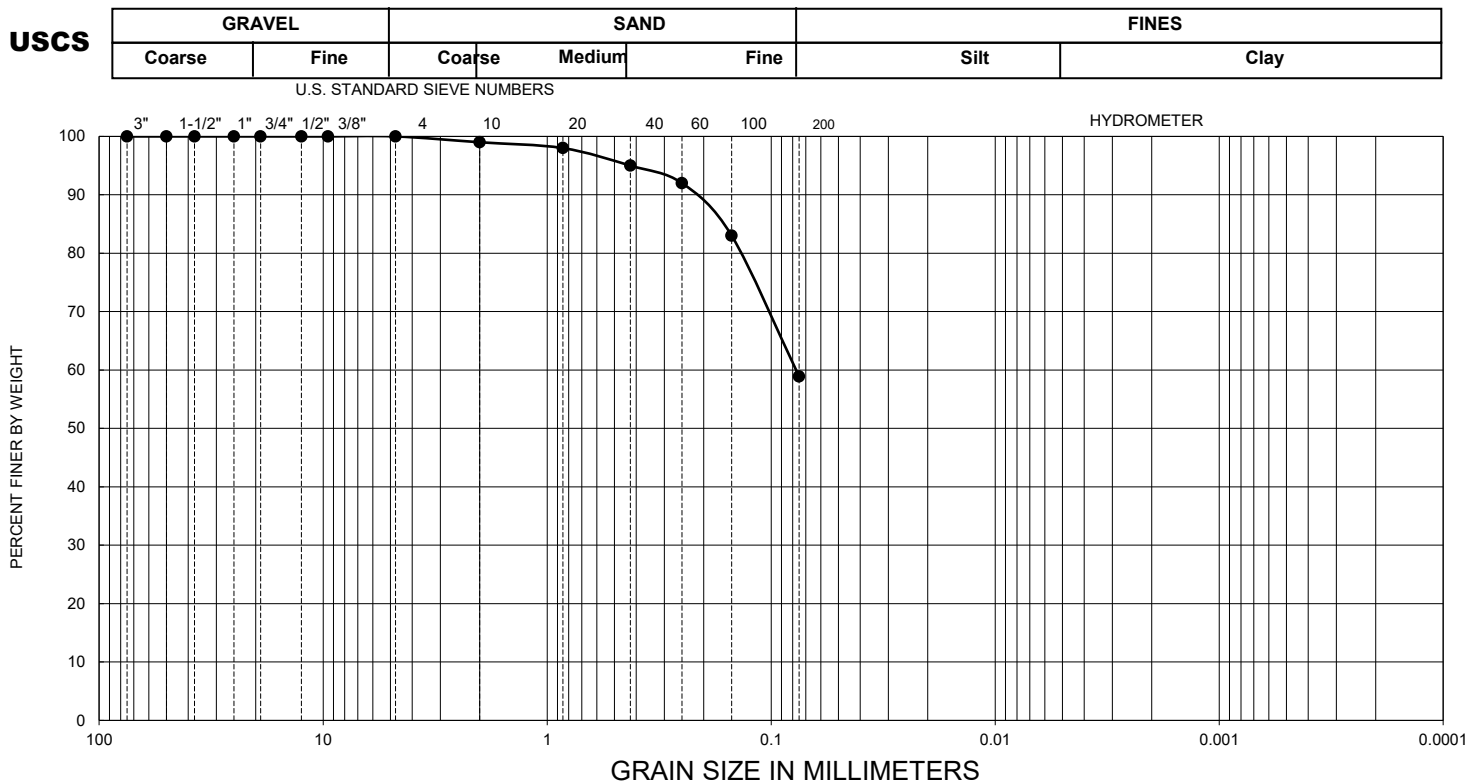
**Lakeside Equestrian Facility
Lakeside, CA**

FIGURE

B-4

Checked by:	JLB	Tech:	Uly P.
Project No.	20180057.001A	Date:	5-Jun-17

Date Tested: 4/19/2017



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
TP1	S1	1-5	58.9	ML

Sample Description	Brown Sandy silt
--------------------	------------------

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	99
	No. 20	0.85 mm	98
	No. 40	0.425 mm	95
	No. 60	0.25 mm	92
	No. 100	0.15 mm	83
	No. 200	.075 mm	58.9

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913



GRADATION TEST RESULTS

**Lakeside Equestrian Facility
Lakeside, CA**

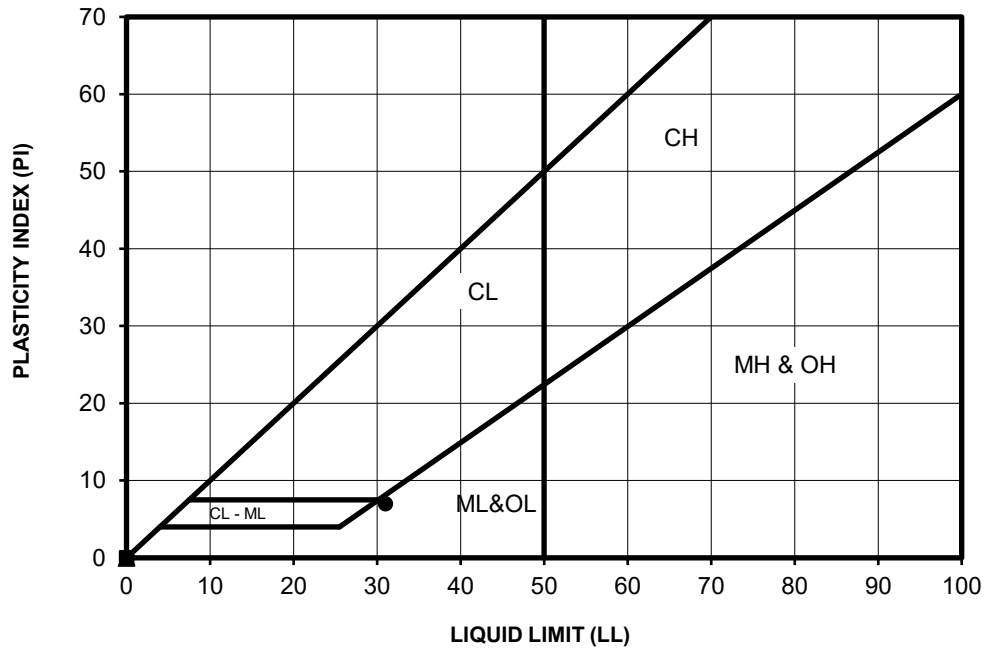
FIGURE

B-5

Checked by:	JLB	Tech:	Uly P.
Project No.	20180057.001A	Date:	5-Jun-17

Date Tested : 4/19/2017

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	B1-S1	1'-5'	31	24	7	ML	ML
■							
◆							
○							
□							
△							
+							
◇							



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.



ATTERBERG LIMITS TEST RESULTS

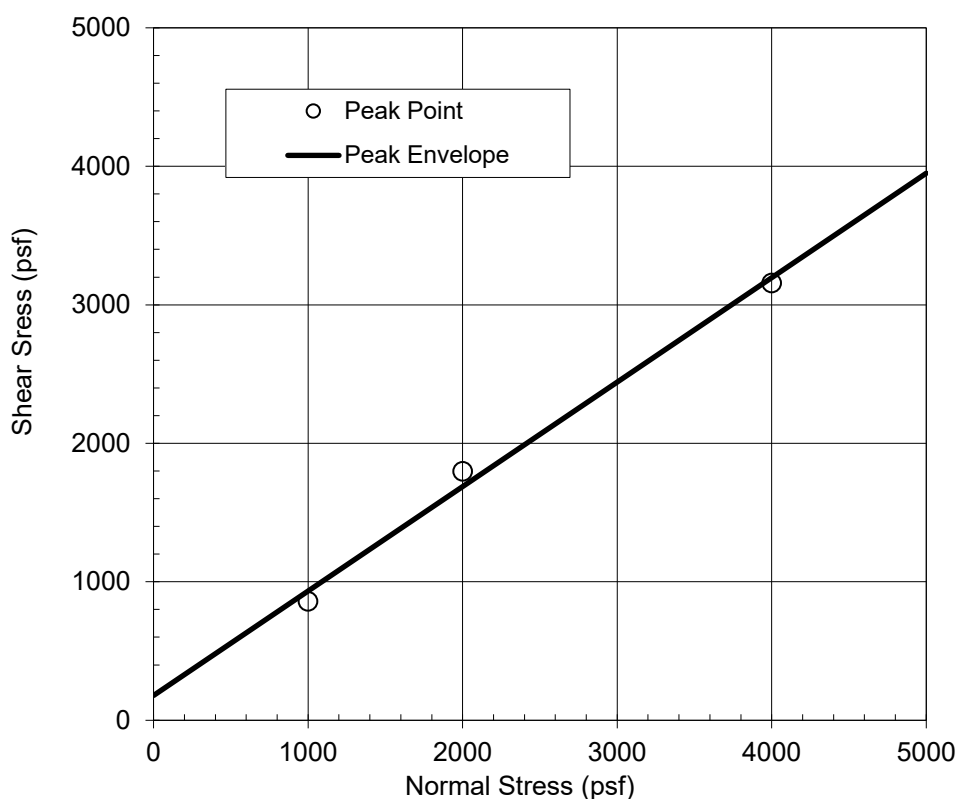
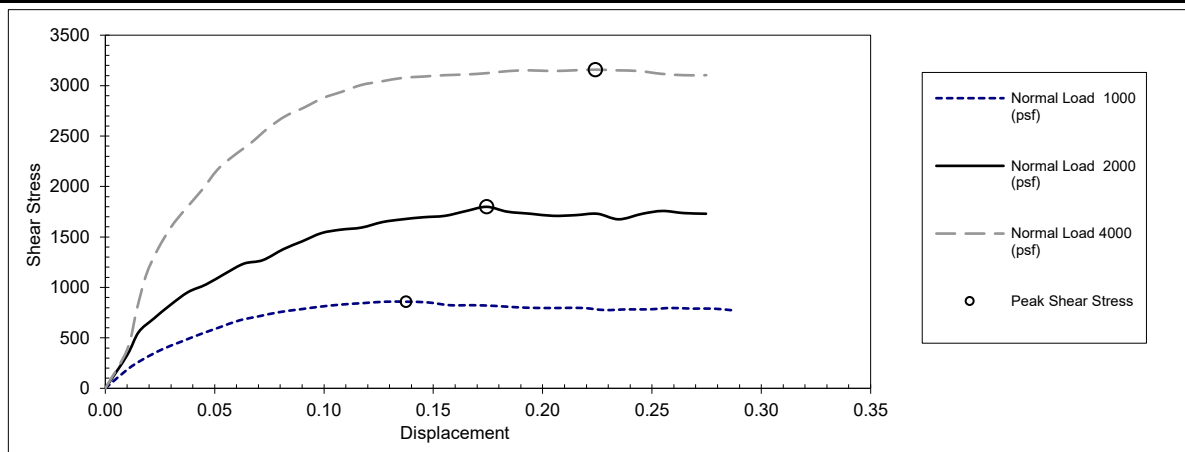
Lakeside Equestrian Facility
Lakeside, CA

FIGURE

B-6

Check by JLB Tested by Uly P.


PROJECT NO: 20180057.001A 5-Jun-17

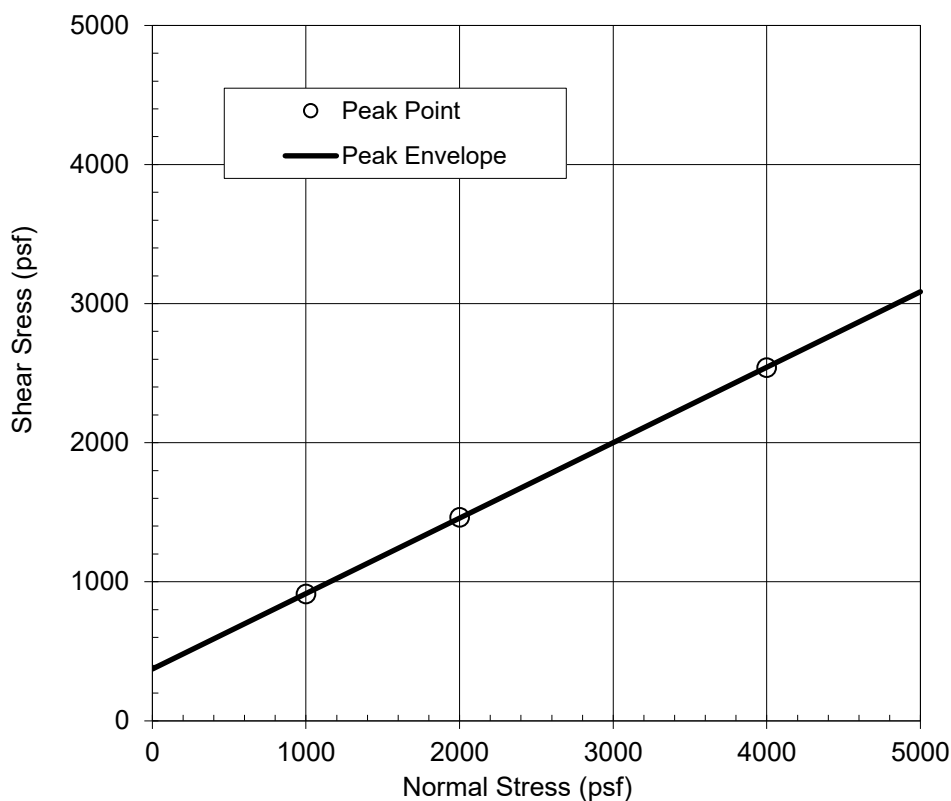
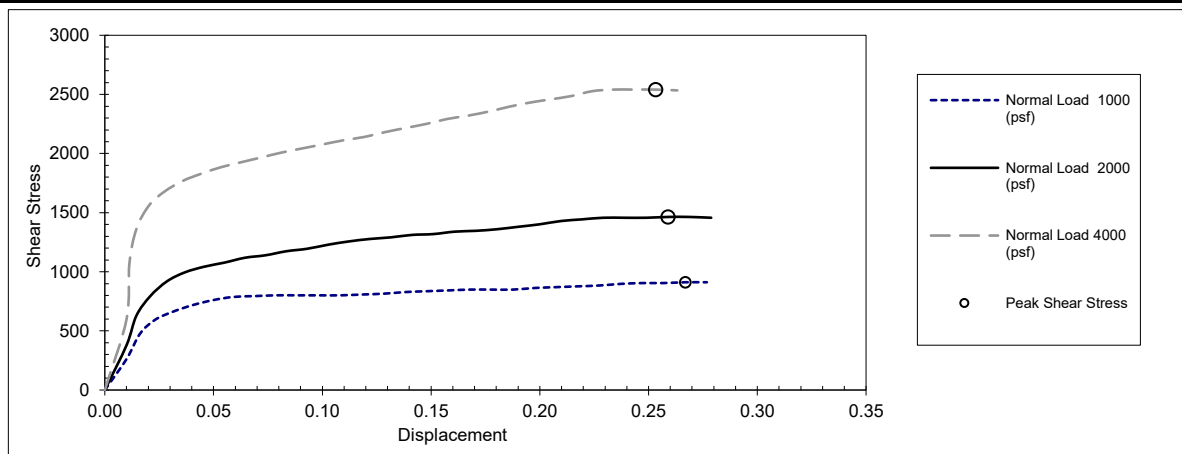


Strain Rate = 0.0118 inch/min
Date Tested: 4/17/2017

				Interpreted Shear Strength			
				Peak			
Boring No.	Sample No.	Depth	UCSC	Cohesion (psf)	Friction Angle (deg)		
B1	S2	6'-6.5'	SM	179	37.0		

Sample description: Brown silty fine sand

			Direct Shear Test Results (ASTM D 3080)		Figure
			Lakeside Equestrian Facility Lakeside, CA		B-7
Checked By:	JLB	Tech :	Uly P.		
Project #	20180057.001A		5-Jun-17		



Strain Rate = 0.00945 inch/min
Date Tested: 4/20/2017

				Interpreted Shear Strength			
				Peak			
Boring No.	Sample No.	Depth	UCSC	Cohesion (psf)	Friction Angle (deg)		
B2	S1	1'-5'	CL	373	28.5		

Sample description: brown sandy clay



Checked By: JLB Tech : Uly P.
Project # 20180057.001A 5-Jun-17

Remolded Direct Shear Test Results (ASTM D 3080)

**Lakeside Equestrian Facility
Lakeside, CA**

Figure

B-8

Boring No.	Sample No.	Depth (ft)	Sample Description
B2	S2B	6'-6.5'	Brown sandy silt

Density Determination		Trial #1	Trial #2
Weight Compacted Sample and Ring		759.3	
Weight of Ring		362.7	
Net Weight of Sample		396.6	
Wet Density, pcf		120.2	
Dry Density, pcf		109.5	

Moisture Determination			
Wet Weight of Sample, g		88.32	
Dry Weight of Sample, g		80.42	
Moisture Content, %		9.8%	

Expansion Index		5	
Corrected Expansion Index		5	(VERY LOW)
% Saturation		49.1	

Expansion Readings		
DATE	TIME	READING
4/19/2017	10:10am	0.2927
4/19/2017	10:20am	0.2921
4/20/2017	10:10am	0.2971

<< Add Water

<< Final

Moisture Content after Test	
Wet+Ring	786.7
Dry	361.1
	17.4%




CHECKED BY: JLB TECH: Uly P.
 JOB NUMBER 20180057.001A DATE: 6/5/2017

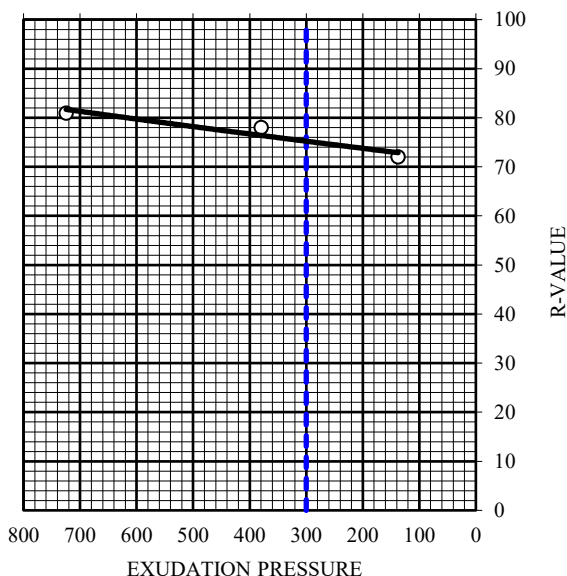
Expansion Index (ASTM D4829)

**Lakeside Equestrian Facility
 Lakeside, CA**

FIGURE

B-9

Boring No.	Sample No.	Depth	Description	Date Tested
TP-3	S1	1'-5'	Dark yellowish brown silty sand	4/18/2017
TEST SPECIMEN				
MOLD NO.	8	5	9	
FOOT PRESSURE, psi	350	350	330	
INITIAL MOISTURE, %	5.5	5.5	5.5	
"AS-IS" WEIGHT, g	1200	1200	1200	
DRY WEIGHT, g	1137.8	1137.8	1137.8	
WATER ADDED, ml	40.5	50	60	
COMPACTION MOISTURE, %	9.0	9.9	10.7	
HEIGHT OF BRIQUETTE, in.	2.45	2.5	2.49	
WEIGHT BRIQUETTE/MOLD, g	3223.4	3219.9	3224.9	
WEIGHT OF MOLD, g	2112.4	2107.6	2114.3	
WEIGHT OF BRIQUETTE, g	1111	1112.3	1110.6	
DRY DENSITY, pcf	126.2	122.8	122.2	
STABILOMETER, 1000 lbs	11	12	14	
2000lbs	18	20	26	
DISPLACEMENT, in	4.71	5.04	4.9	
EXUDATION LOAD, lbs	9102	4771	1727	
EXUDATION PRESSURE, psi	724.7	379.9	137.5	
R-VALUE	81	78	72	
CORRECTED R-VALUE	81	78	72	
DIAL READING, END	0.0210	0.0296	0.0298	
DIAL READING, START	0.0205	0.0300	0.0300	
DIFFERENCE	0.0005	-0.0004	-0.0002	
EXPANSION PRESSURE, PSF	21.8	0.0	0.0	
INITIAL MOISTURE				
WET WEIGHT, g	542.5			
DRY WEIGHT, g	514.4			
WEIGHT OF WATER				
WEIGHT OF SAMPLE				
MOISTURE CONTENT %	5.5			
R-VALUE:	75			
Location:				
<p>Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.</p>				
		R-Value (ASTM D2844) Lakeside Equestrian Facility Lakeside, CA		FIGURE B-10
Tested By: Uly P.		DATE: 5-Jun-17		
Job Number: 20180057.001A				



Laboratory Test Report

Client: **County of San Diego, CA**

Project: **20180057.001A**

T-County of San Diego, CA: Lakeside Eque

05-000L - Geotechnical Lab Testing

Report No.: **17-SAN-00179 Rev. 0**

Issued:

Sampled by: **Janna Bonfiglio**

Date: **4/6/2017**

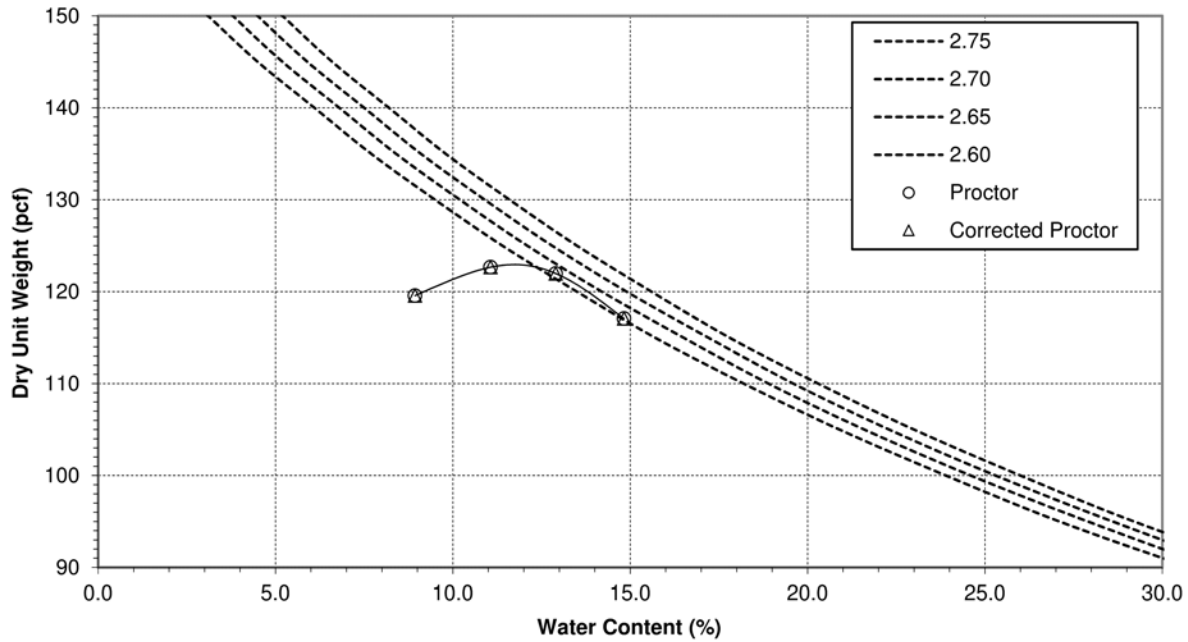
Submitted by: **Janna Bonfiglio**

Date: **4/12/2017**

Tested on **4/17/2017** by **U. Panuncialman**

Material Description: **brown sandy clay**

Location: **B2 / S1 at 1'-5'**



Test Method: ASTM D1557 A	Uncorrected	Corrected
Maximum Dry Unit Weight (pcf)	122.9	na
Optimum Water Content (%)	11.8	na
Oversize Fraction, retained on (%)		<5
Bulk Specific Gravity of Oversize Fraction		na

Rammer Type: Mechanical

Specimen Preparation: Moist

Reviewed on by Ulysses Panuncialman,
Lab Supervisor

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993

Fax 425-7917

Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: April 19, 2017

Purchase Order Number: 20180057.001A

Sales Order Number: 35441

Account Number: KLE

To:

Kleinfelder Inc.

550 West C Street Ste 1200

San Diego, CA 92101

Attention: Uly Panuncialman

Laboratory Number: S06368

Customers Phone: 831-4600

Fax: 831-4619

Sample Designation:

One soil sample received on 04/17/17 at 9:00am
marked as:

Project: Lakeside Equestrian Park

Project #: 20180057.001A

Boring #: B2

Sample #: S1

Depth: 1'-5'

Sampled by Janna Bonfiglio

Date Sampled 04/06/2017

Analysis By California Test 643, 1999, Department of Transportation
Division of Construction, Method for Estimating the Service Life of
Steel Culverts.

pH 8.7

Water Added (ml)

Resistivity (ohm-cm)

10

9200

5

5700

5

3000

5

2200

5

2000

5

1900

5

2100

5

2300

40 years to perforation for a 16 gauge metal culvert.
52 years to perforation for a 14 gauge metal culvert.
72 years to perforation for a 12 gauge metal culvert.
91 years to perforation for a 10 gauge metal culvert.
111 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417

0.011% (110ppm)

Water Soluble Chloride Calif. Test 422

0.004% (43ppm)



Laura Torres

LT/ram

APPENDIX C

INFILTRATION FEASIBILITY STUDY

Categorization of Infiltration Feasibility Condition		Form I-8	
<p>Part 1 - Full Infiltration Feasibility Screening Criteria</p> <p>Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?</p> <p>Note that it is not necessary to investigate each and every criterion in the worksheet if infiltration is precluded. Instead a letter of justification from a geotechnical professional familiar with the local conditions substantiating any geotechnical issues will be required.</p>			
Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X
<p>Provide basis:</p> <p>The geotechnical study performed at the site included percolation testing. The percolation test PERC-1 indicated a raw (unfactored) infiltration rate of 0.31 inches per hour. Our review of Natural Resources Conservation Service (NRCS) Soil Survey Maps (a.k.a. USDA Soil Maps) indicate the site soils consist of Visalia sandy loam. This material is designated as being of the Hydrologic Soils Group "A" which is defined as a well drained material (very low runoff potential). The factored infiltration rate is 0.12 inches per hour assuming a Safety Factor of 2.6.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
2	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	
<p>Provide basis:</p> <p>Infiltration greater than 0.5 inches could be allowed. However, as discussed in Criteria 1 above, site-specific test results for the project indicate a raw infiltration rate of 0.31 inches per hour. Therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. The loose to medium dense soils are potentially liquefiable if saturated, therefore an appreciable amount of infiltration may increase the risk of liquefaction and magnitude of settlement. However, the location of the proposed basin with respect to the proposed structures does not present a significant liquefaction risk.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			

Form I-8 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	<p>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis: Infiltration greater than 0.5 inches could be allowed. However, as discussed in Criteria 1 above, site specific test results for the project indicate an unfactored infiltration rate of 0.31 inches per hour. Therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. However, the depth to the local groundwater table at the site is estimated to be greater than 20 feet below existing site grade based on borings performed at the site. In this respect, the potential for contamination of the local groundwater is considered low. This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
4	<p>Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis: As discussed in Criteria 1 above, site specific test results for the project indicate an unfactored infiltration rate of 0.31 inches per hour; therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. However, it may be assumed that there is a very low probability of causing a potential water balance issue that would change seasonally ephemeral streams or increased discharge of contaminated groundwater to surface waters.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
Part 1 Result *	<p>If all answers to rows 1 - 4 are “Yes” a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration</p> <p>If any answer from row 1-4 is “No”, infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a “full infiltration” design. Proceed to Part 2</p>	NO	

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Form I-8 Page 3 of 4			
<u>Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria</u>			
Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	
<p>Provide basis:</p> <p>The site conditions have been characterized as noted in Criteria 1 to have an unfactored infiltration rate of 0.31 inches per hour and a factored infiltration rate of 0.12 inches/hour. This does not appear to be an "appreciable rate" but it is considered partial infiltration at a rate much lower than 0.5 inches per hour.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			
6	Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	
<p>Provide basis:</p> <p>As discussed previously, an infiltration rate well below 0.5 inch/hour is feasible at the site. Due to the soil conditions at the site, infiltration in any appreciable amount may increase the risk of liquefaction occurring. However, based on the location of the proposed basin to the proposed structures and the low infiltration rate, there is not a significant liquefaction risk to the proposed development.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			

Form I-8 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
<p>Provide basis:</p> <p>As stated previously, the depth to the local groundwater table at the site is greater than 20 feet below existing site grade. In this respect, the potential risks to the local groundwater is considered low. As discussed, an infiltration rate well below 0.5 inches per hour is feasible at the site.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
<p>Provide basis:</p> <p>It does not appear that stormwater infiltration would cause a violation of downstream water rights.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration . If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration .		Partial Infiltration

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Factor of Safety and Design Infiltration Rate Worksheet				Form I-9	
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) $p = w \times v$
A	Suitability Assessment	Soil assessment methods	0.25	2	0.5
		Predominant soil texture	0.25	2	0.5
		Site soil variability	0.25	2	0.5
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$				1.75
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	2	0.5
		Compaction during construction	0.25	2	0.5
		Design Safety Factor, $S_B = \Sigma p$				1.5
Combined Safety Factor, $S_{total} = S_A \times S_B$				2.6	
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)				0.31	
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$				0.12	
Supporting Data					
<p>Briefly describe infiltration test and provide reference to test forms:</p> <p>Percolation test was performed at the site location at a depth of 5 feet bgs.</p>					

Categorization of Infiltration Feasibility Condition		Form I-8	
<p><u>Part 1 - Full Infiltration Feasibility Screening Criteria</u></p> <p>Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?</p> <p>Note that it is not necessary to investigate each and every criterion in the worksheet if infiltration is precluded. Instead a letter of justification from a geotechnical professional familiar with the local conditions substantiating any geotechnical issues will be required.</p>			
Criteria	Screening Question	Yes	No
1	<p>Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</p>		X
<p>Provide basis:</p> <p>The geotechnical study performed at the site included percolation testing. The percolation test PERC-1 indicated a raw (unfactored) infiltration rate of 0.11 inches per hour. Our review of Natural Resources Conservation Service (NRCS) Soil Survey Maps (a.k.a. USDA Soil Maps) indicate the site soils consist of Visalia sandy loam. This material is designated as being of the Hydrologic Soils Group "A" which is defined as a well drained material (very low runoff potential). The factored infiltration rate is 0.04 inches per hour assuming a Safety Factor of 2.6.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
2	<p>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.</p>	X	
<p>Provide basis:</p> <p>Infiltration greater than 0.5 inches could be allowed. However, as discussed in Criteria 1 above, site specific test results for the project indicate a raw infiltration rate of 0.11 inches per hour; therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. Additionally, the site is potentially liquefiable and therefore any infiltration in any appreciable amount may increase the risk of liquefaction occurring at the site. However, the location of the proposed basin with respect to the proposed structures does not present a significant liquefaction risk.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			

Form I-8 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	<p>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis: Infiltration greater than 0.5 inches could be allowed. However, as discussed in Criteria 1 above, site specific test results for the project indicate an unfactored infiltration rate of 0.11 inches per hour. Therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. However, the depth to the local groundwater table at the site is estimated to be greater than 20 feet below existing site grade based on borings performed at the site. In this respect, the potential for contamination of the local groundwater is considered low. This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
4	<p>Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis: As discussed in Criteria 1 above, site specific test results for the project indicate an unfactored infiltration rate of 0.11 inches per hour; therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. However, it may be assumed that there is a very low probability of causing a potential water balance issue that would change seasonally ephemeral streams or increased discharge of contaminated groundwater to surface waters.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
Part 1 Result *	<p>If all answers to rows 1 - 4 are “Yes” a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration</p> <p>If any answer from row 1-4 is “No”, infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a “full infiltration” design. Proceed to Part 2</p>		No

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Form I-8 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	

Provide basis:

The site conditions have been characterized as noted in Criteria 1 to have an unfactored infiltration rate of 0.11 inches per hour and a factored infiltration rate of 0.04 inches per hour. This does not appear to be an "appreciable rate" but it is considered partial infiltration at a rate much lower than 0.5 inches per hour.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	
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Provide basis:

As discussed previously, infiltration is feasible at the site at a rate well below 0.5 inch/hour is. Additionally, due to the soil conditions at the site, infiltration in any appreciable amount may increase the risk of liquefaction occurring at the site. However, based on the location of the proposed basin to the proposed structures, there is not a significant liquefaction risk to the proposed development.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Form I-8 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	<p>Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)?</p> <p>The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis:</p> <p>As stated previously, the depth to the local groundwater table at the site is greater than 20 feet below existing site grade. In this respect, the potential risks to the local groundwater is considered low. As discussed, an infiltration rate well below 0.5 inches per hour is feasible at the site.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			
8	<p>Can infiltration be allowed without violating downstream water rights? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis:</p> <p>It does not appear that stormwater infiltration would cause a violation of downstream water rights.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			
Part 2 Result*	<p>If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration.</p> <p>If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.</p>		Partial Infiltration

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Factor of Safety and Design Infiltration Rate Worksheet				Form I-9	
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A	Suitability Assessment	Soil assessment methods	0.25	2	0.5
		Predominant soil texture	0.25	2	0.5
		Site soil variability	0.25	2	0.5
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$				1.75
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	2	0.5
		Compaction during construction	0.25	2	0.5
		Design Safety Factor, $S_B = \Sigma p$				1.5
Combined Safety Factor, $S_{total} = S_A \times S_B$				2.6	
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)				0.11	
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$				0.04	
Supporting Data					
<p>Briefly describe infiltration test and provide reference to test forms:</p> <p>Percolation test was performed at the site location at a depth of 5 feet bgs.</p>					



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **San Diego County Area, California**



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

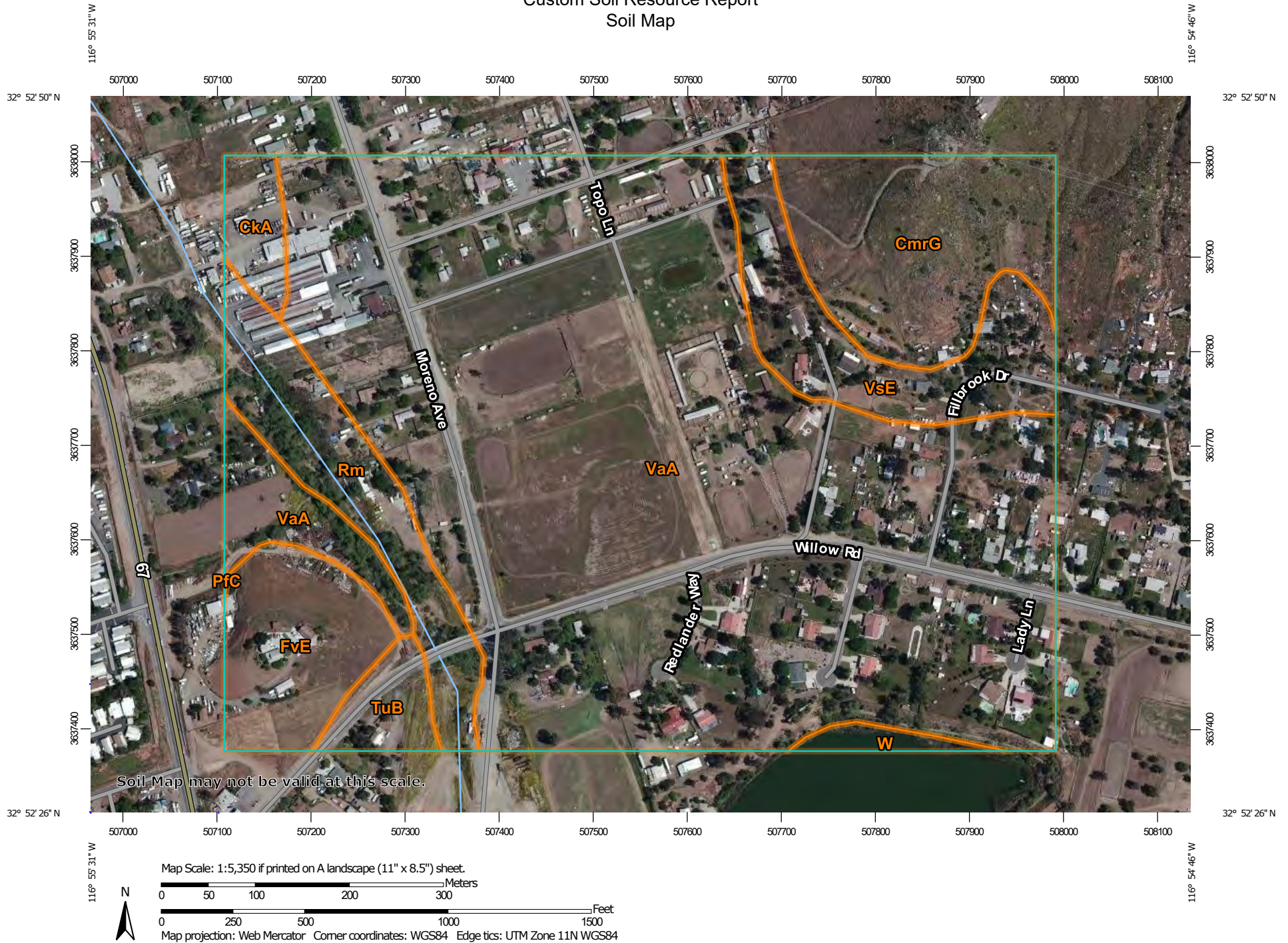
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

 Blowout


 Borrow Pit

 Clay Spot


 Closed Depression

 Gravel Pit


 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop


 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip


 Sodic Spot


 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 10, Sep 12, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

San Diego County Area, California (CA638)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CkA	Chino silt loam, saline, 0 to 2 percent slopes	2.3	1.6%
CmrG	Cienega very rocky coarse sandy loam, 30 to 75 percent slopes	12.7	9.2%
FvE	Fallbrook-Vista sandy loams, 15 to 30 percent slopes	7.5	5.4%
PfC	Placentia sandy loam, thick surface, 2 to 9 percent slopes	0.0	0.0%
Rm	Riverwash	8.9	6.4%
TuB	Tujunga sand, 0 to 5 percent slopes	2.5	1.8%
VaA	Visalia sandy loam, 0 to 2 percent slopes	94.0	68.0%
VsE	Vista coarse sandy loam, 15 to 30 percent slopes	9.4	6.8%
W	Water	1.0	0.7%
Totals for Area of Interest		138.2	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They

generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Diego County Area, California

CkA—Chino silt loam, saline, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hb9p

Elevation: 20 to 3,100 feet

Mean annual precipitation: 8 to 20 inches

Mean annual air temperature: 61 to 64 degrees F

Frost-free period: 230 to 340 days

Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Chino and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chino

Setting

Landform: Alluvial fans

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope, rise

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 20 inches: silt loam

H2 - 20 to 33 inches: silt loam

H3 - 33 to 60 inches: loam, silt loam

H3 - 33 to 60 inches:

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 5.0

Available water storage in profile: Very high (about 13.8 inches)

Interpretive groups

Land capability classification (irrigated): 2s

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 5 percent

Hydric soil rating: No

Placentia

Percent of map unit: 5 percent

Hydric soil rating: No

Visalia

Percent of map unit: 4 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

Landform: Alluvial fans

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope, rise

Down-slope shape: Linear

Across-slope shape: Convex

Hydric soil rating: Yes

CmrG—Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes

Map Unit Setting

National map unit symbol: hb9v

Elevation: 500 to 4,000 feet

Mean annual precipitation: 8 to 35 inches

Mean annual air temperature: 45 to 64 degrees F

Frost-free period: 110 to 300 days

Farmland classification: Not prime farmland

Map Unit Composition

Cieneba and similar soils: 45 percent

Rock outcrop: 45 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cieneba

Setting

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from granite and granodiorite

Typical profile

H1 - 0 to 8 inches: coarse sandy loam

Custom Soil Resource Report

H2 - 8 to 12 inches: weathered bedrock

Properties and qualities

Slope: 30 to 75 percent

Depth to restrictive feature: 4 to 20 inches to paralithic bedrock

Natural drainage class: Somewhat excessively drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: D

Ecological site: SHALLOW LOAMY (1975) (R019XD060CA)

Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Typical profile

H1 - 0 to 4 inches: unweathered bedrock

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Hydric soil rating: No

Minor Components

Vista

Percent of map unit: 5 percent

Hydric soil rating: No

Las posas

Percent of map unit: 5 percent

Hydric soil rating: No

FvE—Fallbrook-Vista sandy loams, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hbc2
Elevation: 200 to 3,900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 210 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Fallbrook and similar soils: 50 percent
Vista and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fallbrook

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 12 inches: loam, sandy loam
H2 - 6 to 12 inches: sandy clay loam, clay loam
H3 - 12 to 28 inches: loam, sandy loam
H3 - 12 to 28 inches: weathered bedrock
H4 - 28 to 47 inches:
H4 - 28 to 47 inches:
H5 - 47 to 51 inches:

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very high (about 13.2 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Vista

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Grus derived from quartz-diorite and/or grus derived from granodiorite

Typical profile

H1 - 0 to 19 inches: sandy loam
H2 - 19 to 35 inches: coarse sandy loam, sandy loam
H2 - 19 to 35 inches: weathered bedrock
H3 - 35 to 39 inches:

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Cieneba

Percent of map unit: 5 percent
Hydric soil rating: No

Las posas

Percent of map unit: 5 percent
Hydric soil rating: No

PfC—Placentia sandy loam, thick surface, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hbfh

Elevation: 50 to 2,500 feet

Mean annual precipitation: 12 to 18 inches

Mean annual air temperature: 61 to 63 degrees F

Frost-free period: 200 to 300 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Placentia and similar soils: 85 percent

Minor components: 11 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Placentia

Setting

Landform: Alluvial fans

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope, rise

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 13 inches: sandy loam

H2 - 13 to 34 inches: clay, sandy clay

H2 - 13 to 34 inches:

Properties and qualities

Slope: 2 to 9 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 25.0

Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Custom Soil Resource Report

Ecological site: CLAYPAN (1975) (R019XD061CA)

Hydric soil rating: No

Minor Components

Bonsall

Percent of map unit: 5 percent

Hydric soil rating: No

Ramona

Percent of map unit: 5 percent

Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent

Landform: Depressions

Hydric soil rating: Yes

Rm—Riverwash

Map Unit Setting

National map unit symbol: hbg6

Elevation: 700 to 2,900 feet

Mean annual precipitation: 8 to 15 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 110 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Riverwash: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riverwash

Setting

Landform: Drainageways

Parent material: Sandy, gravelly, or cobbly alluvium derived from mixed sources

Typical profile

H1 - 0 to 6 inches: gravelly coarse sand

H2 - 6 to 60 inches: stratified extremely gravelly coarse sand to gravelly sand

Properties and qualities

Slope: 0 to 4 percent

Natural drainage class: Excessively drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: About 60 to 72 inches

Frequency of flooding: Occasional

Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Hydric soil rating: Yes

TuB—Tujunga sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hbh0

Elevation: 10 to 2,500 feet

Mean annual precipitation: 10 to 25 inches

Mean annual air temperature: 59 to 64 degrees F

Frost-free period: 280 to 350 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Tujunga and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting

Landform: Flood plains

Landform position (three-dimensional): Riser, flat

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 14 inches: sand

H2 - 14 to 34 inches: loamy sand, fine sand, sand

H2 - 14 to 34 inches: stratified gravelly sand to gravelly loamy sand

H2 - 14 to 34 inches:

H3 - 34 to 60 inches:

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): 3s

Land capability classification (nonirrigated): 4e

Custom Soil Resource Report

Hydrologic Soil Group: A
Ecological site: SANDY (1975) (R019XD035CA)
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 5 percent
Hydric soil rating: No

Ramona

Percent of map unit: 5 percent
Hydric soil rating: No

Riverwash

Percent of map unit: 2 percent
Landform: Drainageways
Hydric soil rating: Yes

Visalia

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Landform: Flood plains
Hydric soil rating: Yes

VaA—Visalia sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hbh2
Elevation: 600 to 1,200 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 57 degrees F
Frost-free period: 200 to 350 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Visalia and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Visalia

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser, flat
Down-slope shape: Linear
Across-slope shape: Convex

Custom Soil Resource Report

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 12 inches: sandy loam

H2 - 12 to 40 inches: sandy loam, fine sandy loam

H2 - 12 to 40 inches: very fine sandy loam, loam

H3 - 40 to 60 inches:

H3 - 40 to 60 inches:

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Available water storage in profile: Very high (about 14.1 inches)

Interpretive groups

Land capability classification (irrigated): 1

Land capability classification (nonirrigated): 2c

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Greenfield

Percent of map unit: 5 percent

Hydric soil rating: No

Grangeville

Percent of map unit: 5 percent

Hydric soil rating: No

Placentia

Percent of map unit: 2 percent

Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

Landform: Flood plains

Hydric soil rating: Yes

VsE—Vista coarse sandy loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hbhc
Elevation: 400 to 3,900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Vista and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vista

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite and quartz-diorite

Typical profile

H1 - 0 to 15 inches: coarse sandy loam
H2 - 15 to 30 inches: coarse sandy loam, sandy loam
H2 - 15 to 30 inches: weathered bedrock
H3 - 30 to 34 inches:

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

Minor Components

Fallbrook

Percent of map unit: 10 percent

Hydric soil rating: No

Cieneba

Percent of map unit: 5 percent

Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

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APPENDIX D

GEOTECHNICAL BUSINESS COUNCIL INSERT

Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply this report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an

assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by:* the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time to perform additional study.* Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help

others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold-prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical-engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.



8811 Colesville Road/Suite G106, Silver Spring, MD 20910

Telephone: 301/565-2733 Facsimile: 301/589-2017

e-mail: info@geoprofessional.org www.geoprofessional.org

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June 8, 2017
Kleinfelder Project No. 20180057.001A

Mr. Bill Saumier
Senior Project Manager
San Diego County Department of Parks and Recreation
5500 Overland Ave #410
San Diego, California 92123

**SUBJECT: Geotechnical Investigation
Lakeside Equestrian Facility
Willow Road and Moreno Avenue
Lakeside, California**

Dear Mr. Saumier,

This report presents the results of our geotechnical engineering investigation and recommendations for design and construction of the proposed Lakeside Equestrian Facility located at the northeast corner of Willow Road and Moreno Avenue in Lakeside, California.

We appreciate this opportunity to be of service and look forward to continue working with you in the future. If you have any questions about this report or need additional services, please contact us at 619.831.4600.

Respectfully submitted,

KLEINFELDER


Janna Bonfiglio, EIT
Staff Engineer


Kevin Crennan, GE 2511
Project Manager




Scott Rugg, CEG 1651
Senior Engineering Geologist





**GEOTECHNICAL INVESTIGATION
LAKESIDE EQUESTRIAN FACILITY
WILLOW ROAD AND MORENO AVENUE
LAKESIDE, CALIFORNIA
KLF PROJECT NO. 20180057.001A**

JUNE 8, 2017

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**ONLY THE CLIENT OR ITS DESIGNATED REPRESENTATIVES MAY USE THIS DOCUMENT AND ONLY FOR THE SPECIFIC
PROJECT FOR WHICH THIS REPORT WAS PREPARED.**

A Report Prepared for:


Mr. Bill Saumier
San Diego County Department of Parks and Recreation
5500 Overland Ave #410
San Diego, California 92123

**GEOTECHNICAL INVESTIGATION
LAKESIDE EQUESTRIAN FACILITY
WILLOW ROAD AND MORENO AVENUE
LAKESIDE, CALIFORNIA**

Prepared by:




Janna Bonfiglio, EIT
Staff Engineer



Scott Rugg, CEG 1651
Senior Engineering Geologist

Reviewed by:



Kevin Crennan, GE 2511
Project Manager



KLEINFELDER
550 West C Street, Suite 1200
San Diego, California 92101
Phone: 619.831.4600
Fax: 619.232.1039

June 8, 2017
Kleinfelder Project No. 20180057.001A

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- A Field Investigation Logs
- B Laboratory Test Results
- C Infiltration Feasibility Study
- D Geotechnical Business Council Insert

1 INTRODUCTION

1.1 BACKGROUND

This report presents the results of Kleinfelder's geotechnical investigation for the proposed Lakeside Equestrian Facility, located at the intersection of Willow Road and Moreno Avenue in Lakeside, California. Based on the provided scope of work and the May 2016 Lakeside Equestrian Facility Concept Plan, we understand that the project primarily consists of two arenas, one covered and one un-covered, livestock corrals, associated dirt and gravel parking lots, a trail staging area, a perimeter track, and other associated ancillary facilities such as hoist pads, a shop and tack room, restroom facilities, and a retention basin.

The purpose of our geotechnical investigation was to evaluate the subsurface conditions at the site, determine potential geologic/seismic hazards, perform geotechnical engineering evaluations, and provide geotechnical recommendations for design and construction. This report presents the results from our subsurface exploration, laboratory testing, geotechnical analyses, and our geotechnical conclusions and recommendations pertaining to the project site.

1.2 SITE DESCRIPTION

The proposed Lakeside Equestrian Facility site is located northeast of the intersection of Willow Road and Moreno Avenue in Lakeside, California. The site location is depicted on Figure 1, Site Vicinity Map.

The approximate coordinates of the project site are:

Latitude: 32.877°N Longitude: -116.920°W

The approximate 13.88-acre project site currently consists of an oval-shaped corral with a perimeter fence at the northwest portion of the site and two rectangular-shaped, fenced-in corrals at the northeast portion. The entrance to the site is located at the west edge and leads to a cleared rectangular-shaped staging area. The staging area is bordered by a loop road that circles around the east, south, west, and central portions of the site. The remainder of the site consists of vegetated land. The site is currently used by ranchers for enclosure and upkeep of cattle.

Based on the provided existing topography plan, the site is relatively flat with approximate surface elevations generally ranging between 404 and 413 feet Mean Sea Level (MSL).

1.3 PROJECT DESCRIPTION

We understand that new construction at the site will include one covered arena and one outside arena, livestock corrals, associated dirt and gravel parking lots, a trail staging area, a perimeter track, and other associated ancillary facilities. The oval-shaped arenas are proposed to be 300 feet in length by 150 feet in width. The outside arena is located at the northwest portion of the site and will have associated bleachers at the southern edge of the arena. The covered arena is located at the east portion of the site and will have associated bleachers at the west edge of the arena. The livestock corrals will be located at the northeast portion of the site and will consist of four rectangular-shaped corrals. A shop room, tack room, and hoist pad will be located east of the livestock corrals. The trail staging area with an associated shade structure will be located at the southeast portion of the site along with a proposed retention basin.

Other site improvements will include the decomposed granite (DG) parking lots located at the west-central and south portions of the site, a perimeter trail that loops around all edges of the site, restroom facilities, and various landscaped/graded areas.

An aerial photograph of the project site and the proposed concept plan with our exploration locations are presented as Figure 2, Existing Site Conditions and Exploration Plan and Figure 3, Proposed Concept Plan and Exploration Plan.

1.4 PURPOSE AND SCOPE OF SERVICES

The purpose of our geotechnical and geologic engineering services is to evaluate the soil and geologic conditions at the site and provide conclusions and recommendations for design and construction of the proposed site development. The scope of services for this study included the following:

- Review of readily available geologic maps and aerial photography;
- Drilling and sampling two borings within the proposed arena areas;
- Drilling and sampling two shallow borings in the proposed retention basin area and performing two percolation tests;
- Excavating and sampling seven test pits throughout the site,
- Performing laboratory testing;
- Preparing a geotechnical engineering report which includes the following:
 - A description of the proposed project including a vicinity map and a site plan showing approximate locations of field explorations;

- Discussion of field exploration methods, logs of borings and test pits, percolation test results, and laboratory test procedures and results;
- Discussion of the site and subsurface conditions, including encountered groundwater levels, and anticipated excavation characteristics;
- Discussion of regional geologic setting and potential geologic hazards at the site including potential faulting and seismicity in the region;
- Seismic design parameters in accordance with the 2016 California Building Code;
- Guidelines for earthwork construction including recommendations for site preparation, temporary slopes, trench excavations, and fill/backfill placement and compaction;
- Recommendations for foundation type(s), including recommended geotechnical parameters for foundation design and estimated settlements;
- Recommendations for slabs-on-grade floor design and construction; and
- Discussion of soil properties affecting steel and corrosion and concrete attack.

The recommendations contained within this report are subject to the limitations presented in Section 5.0.

2 INVESTIGATIVE METHODS

2.1 SUBSURFACE INVESTIGATION

We performed a geotechnical subsurface investigation that consisted of two borings performed in the proposed arena footprint areas, two shallow borings and associated percolation testing performed in the proposed retention basin area, seven test pits performed at accessible areas throughout the site, and laboratory testing. The boring and test pit logs are provided in Appendix A and the laboratory test results are provided in Appendix B. The percolation test results are provided in Appendix C.

2.1.1 Borehole Explorations

The borings, designated as B-1 and B-2, were drilled by Pacific Drilling on April 6, 2017 within the proposed arena footprints. Boreholes were completed using a Fraste Multidrill drill rig equipped with 8-inch outer-diameter hollow-stem augers. The borings were each advanced to a termination depth of 20 feet below the existing ground surface. The approximate borehole locations are shown on Figures 2 and 3.

A staff engineer and an engineering geologist from our office logged the subsurface conditions encountered in the boreholes and collected soil samples for further evaluation and laboratory testing. Selected bulk and relatively intact samples were retrieved from the boreholes, sealed, and transported to our laboratory for further evaluation. A bulk sample was collected from the approximate upper 5 feet of each borehole and thereafter the typical vertical sampling interval for the boreholes was approximately every 5 feet to the total depth explored. We recorded the number of blows to drive a Modified California (Mod-Cal) sampler using a 140-pound automatic hammer dropped 30 inches. Upon completion, boreholes were backfilled with soil cuttings. A summary of the Kleinfelder field exploration program and the logs of the exploratory boreholes are presented in Appendix A.

2.1.2 Test Pit Excavations

Seven test pit excavations, designated at TP-1 through TP-6, were performed on April 6, 2017 by Cut 'n Core using a CAT 430F2 backhoe excavator. The test pits were completed to depths ranging from 4 $\frac{3}{4}$ to 5 feet below ground surface with the exception of test pit TP-4, which encountered an underground metal storage tank at approximately 2 feet below grade. TP-4 was terminated early due to the encountered tank, backfilled, and an offset test pit was performed as TP-4A.

Our field engineer logged the test pits and collected bulk soil samples for further evaluation and laboratory testing. The test pits were backfilled and compacted with excavated soil upon completion in approximate 8-inch-thick loose lifts. The test pit logs from our investigation are given in Appendix A.

2.1.3 Percolation Testing

The percolation tests, designated as PERC-1 and PERC-2, were drilled on April 6, 2017 within the proposed retention basin area. Due to the soil and pre-soak conditions, PERC-1 met the "sandy soil" test standard in accordance with the 2016 County of San Diego BMP Design Manual and therefore PERC-1 was conducted on April 6, 2017. Pre-soak conditions for PERC-2 met the "non-sandy soil" test standard and therefore the percolation test was conducted on April 7, 2017. The percolation tests were performed by our field engineer and an infiltration feasibility study was performed based on our test results in accordance with the BMP Design Manual. The infiltration feasibility study is included in Appendix C and recommendations are provided in Section 4.3.

2.2 LABORATORY TESTING

A laboratory testing program was conducted to substantiate field classifications and evaluate selected physical characteristics and engineering properties of the soils encountered. Moisture content, unit weight, Atterberg Limits (plasticity), sieve analyses, modified proctor compaction, direct shear strength, expansion index (EI), and corrosion tests were performed in general accordance with the applicable ASTM or Caltrans test methods. Results of the laboratory testing program are presented in Appendix B.

3 SITE CONDITIONS

3.1 GEOLOGIC EVALUATION

Our geologic evaluation consisted of reviewing available aerial photographs and geologic maps along with observation of the existing site conditions during our subsurface investigation. The results of the evaluation are included in the following sections.

3.1.1 GEOLOGIC SETTING

San Diego County is located within the southern portion of California's Peninsular Ranges Geomorphic Province (CGS, 2002). This province is characterized as an assemblage of north-to-northwest-trending, high-relief ranges stretching south from the Santa Monica Mountains in Los Angeles, through San Diego County, and well into Baja California, Mexico. Notable regional mountain ranges include the Santa Ana Mountains, the Laguna Mountains, and the Cuyamaca Mountains. The development of this mountainous terrain is closely tied to the transform tectonics of the San Andreas Fault System.

The County encompasses three geomorphic subzones that are set in a series of north-to-northwest trending belts, roughly parallel to the Pacific coastline. From west to east, these zones are composed of a relatively narrow, low-relief coastal plain; a dominant, central, high-relief mountainous zone; and a low-lying desert zone on the east. The project site is located within the western edge of the central mountainous subzone, adjacent to the coastal plain subzone.

The mountainous subzone, which includes the site, is underlain by basement material of Cretaceous to Jurassic age igneous and metamorphic bedrock described above. The coastal plain subzone to the west of the site is underlain by Cretaceous to Tertiary rocks consist of a variety of sandstones, claystones, siltstones and conglomerates which overlie the basement rocks described above.

During the latest Pleistocene, the land surface throughout San Diego County was down-cut and eroded by fluvial processes in response to a world-wide glacially induced drop in sea level. This erosional event resulted in the dissected system of east to west flowing drainages and intervening basins that empty into the Pacific Ocean. Near the coast, these drainages down cut several hundreds of feet below current sea-level elevations. Near the end of the Pleistocene epoch and continuing up to the present, sea-level gradually rose as the continental glaciers receded, which forced in-filling of the eroded drainages with alluvial sediments. Mission Valley which is drained by the San Diego River, is one of the larger of these in-filled drainage features of San Diego

County. The project site is located within the San Vicente Creek Drainage which is a tributary to the upper drainage area of the San Diego River.

The regional geology of the project area is depicted on the Regional Geologic Map (Todd 2004) of Figure 4. We also reviewed other historic geologic maps covering the site by Tan (1992 and 2002) and vintage aerial photography (USDA 1953) as part of our geologic evaluation.

3.1.2 TECTONIC SETTING

California is one of the most tectonically active areas of the United States. This is because it straddles the boundary of two global tectonic plates known as the North American Plate (on the east) and the Pacific Plate (on the west). The main plate boundary fault is defined by the San Andreas fault which crosses through some of the most densely developed areas of both southern and northern California. It stretches northwest from the Gulf of California in Mexico, through the desert region of the Imperial Valley, crossing the San Bernardino region, and traversing up into northern California, where it eventually trends offshore near San Francisco (Jennings, 1994; Jennings and Bryant, 2010). Within southern California, the plate boundary is a complex system of numerous faults known as the San Andreas Fault System (SAFS) that spans a 150-mile-wide zone from the main San Andreas fault in the Imperial Valley, westward offshore of San Diego (Powell et al., 1993; and Wallace, 1990). The major faults east of the site (from east to west) include the San Andreas, San Jacinto, and Elsinore faults. Major faults west of the site include the Rose Canyon-Newport-Inglewood, Palos Verdes-Coronado Bank, San Diego Trough, and San Clemente faults.

One of the most dominant zone of active faulting within the San Diego region is the Rose Canyon Fault Zone (RCFZ). The fault zone extends through the coastal portion of metropolitan San Diego, north from the southern coast of Coronado up through La Jolla where it trends offshore near the La Jolla Shores Beach. North of La Jolla the fault continues north-northwest sub-parallel to the coastline up towards Newport Beach. South of downtown San Diego, the fault zone splits into several splays that underlie San Diego Bay, Coronado, and the ocean floor south of Coronado. The fault zone consists of predominantly right-lateral strike-slip faults but certain segments also display normal, oblique, or reverse components.

The nearest active faults to the site are the Rose Canyon Fault, located approximately 18 miles southwest of the site, and the Elsinore Fault, located approximately 25 miles northeast of the site. An active fault is one which has undergone movement within the last 11,000 years. Further

discussion of faulting and seismicity relative to the site is provided in the Section 4.1.3 of this report and the zone of faulting near the site is depicted on Figure 5.

3.2 SITE GEOLOGY AND SUBSURFACE CONDITIONS

Geologic units observed in the borings and test pits consist of Holocene-age alluvial deposits. The alluvial deposits were found to underlay surficial fill material in test pits TP-4, TP-4A, and TP-6 and borings PERC-1 and PERC-2. Based on the reviewed geologic maps, the alluvial deposits are underlain by Early Cretaceous-age granitoid rocks predominantly consisting of tonalite and granodiorite. The granitoid rock formation was not encountered in our subsurface investigation to a maximum depth of 20 feet below grade.

The aerial extent of these geologic units is depicted on Figure 4. Descriptions of these units are provided in the boring and test pit logs (Appendix A), and generalized descriptions are provided in the subsequent sections below.

3.2.1 Artificial Fill (af)

Artificial fill soils were encountered in test pits TP-4, TP-4A, and TP-6 and borings PERC-1 and PERC-2. Based on a review of historic aerial photographs (USDA 1953), these borings are located near drainage channels that previously existed at the site. Due to the underground tank encountered in test pit TP-4 and the close proximity of these borings and test pits to historic drainage channels, it is likely that the fill was placed during previous developments of the site.

The fill encountered generally consisted of light brown, olive brown, and dark brown silty sand and sandy silt with varying amounts of gravel and debris (fencing, plastic tubing, concrete, and asphalt) and trace amounts of boulders. The thickness of the fill layer ranged from 2 to 5 feet. Test pit TP-6 terminated in the fill layer about 4 ¾ feet below ground surface. It is possible that deeper fills may be present between our exploration locations.

We did not obtain nor were we provided information on the placement and compaction of the fill material and thus the fill is considered undocumented.

3.2.2 Young Alluvial Deposits (Qya)

Alluvial deposits of the Holocene age were encountered below the fill materials in tests pits TP-4, TP-4A, and TP-6 and borings PERC-1 and PERC-2, and at the surface of the all the remaining test pits and borings. The alluvial deposits consisted of silt, sandy silt, silty sand, and poorly-graded sand and extended to the termination depths of the borings and test pits. The

alluvial deposits were observed to contain more coarse-grained material at the southern portion of the site. Field N-values of the coarse-grained portions of the alluvial deposits ranged from 2 to 10 blows per foot indicating very loose to medium dense material. Field N-values of the fine-grained portions of the alluvial deposits ranged from 7 to 36 blows/foot and pocket penetrometer values of the fine-grained portions of the alluvial deposits ranged from 0.25 to 2.25 tsf indicating soft to very stiff material.

3.2.3 Groundwater

Groundwater was not encountered in any of our borings or test pits during our investigation to a maximum depth of 20 feet. Based on a review of a groundwater monitoring report for the nearby Lakeside Road Station entitled "Supplemental Groundwater Monitoring Report, Fourth Quarter 2005", dated January 27, 2006 and prepared by Leighton Consulting, Inc., groundwater was reportedly measured at approximate elevations 388 to 392 MSL between October 2004 and November 2005. The Lakeside Road Station site is located approximately 0.5 miles southeast of our project site.

3.2.4 Infiltration

Our review of the Natural Resource Conservation Service (NRCS) Soil Survey Map indicates that the site soils are Vasilia sandy loam. This material is designated as being of the Hydrologic Soils Group "A" which is defined as a well-drained material (very low runoff potential).

Two percolation tests were performed during our investigation. PERC-1 resulted in an unfactored infiltration rate of 0.31 inches per hour and a factored infiltration rate of 0.12 inches per hour. Percolation test PERC-2 resulted in an unfactored infiltration rate of 0.11 inches per hour and a factored infiltration rate of 0.04 inches per hour. The factored infiltration rates assume a Safety Factor of 2.6. Infiltration design and construction recommendations are further discussed in Section 4.3 and an infiltration feasibility study is provided in Appendix C.

4 DISCUSSIONS, ANALYSIS, AND RECOMMENDATIONS

Based on the results of our site investigation, document review, laboratory testing, and data analysis, it is our opinion that the construction of the proposed project is feasible from a geotechnical standpoint provided our recommendations are incorporated into the design and construction of the project. Kleinfelder should be contacted to re-evaluate our recommendations if changes are made to the planned site grading and/or layout. All grading, excavation, and backfill operations should be observed and tested by a representative of Kleinfelder.

Geotechnical engineering discussion, conclusions, and recommendations for the proposed Lakeside Equestrian Facility structures and site improvements are presented in the following sections. These discussions, conclusions, and recommendations are based on the concept plan provided by the County of San Diego Department of Parks and Recreation and the results of Kleinfelder's field explorations, laboratory testing, and engineering analyses.

4.1 POTENTIAL GEOLOGIC HAZARDS

Kleinfelder has reviewed the site with respect to potential geologic hazards. This evaluation is based on review of geologic maps, aerial photographs, our geologic site reconnaissance, and boring, test pits, and laboratory data.

Potential geologic hazards considered in our study include surface rupture, seismic shaking, lurching, liquefaction, seismically induced settlement, seiches and flooding, landslides, and expansive soils. The following sections discuss these hazards and their potential at this site in more detail.

4.1.1 Surface Rupture

As previously discussed in Section 3.1.2, the subject site is not underlain by known active or potentially active faults. The closest active faults to the project site are the Rose Canyon Fault, located approximately 18 miles southwest of the site, and the Elsinore Fault, located approximately 25 miles northeast of the site. The results of our site reconnaissance and review of historical aerial photography did not reveal indications of faults crossing the project site. Based on this data, it is our opinion that the potential for ground rupture due to faulting at the site is low.

4.1.2 Ground Lurching

Ground lurching is defined as movement of low density materials on a bluff, steep slope, or embankment due to earthquake shaking. Steep fill slopes are particularly prone to lurching. Based on the relatively gentle slopes observed on the project site, it is our opinion that the hazard with respect to ground lurching is low.

4.1.3 Seismic Shaking and CBC Seismic Design Parameters

The most significant seismic events likely to affect the project site would be an earthquake with a Moment Magnitude of approximately $M_m=6.9$ (Petersen et al. 2008) resulting from rupture along the Rose Canyon Fault located approximately 18 miles away, or an earthquake with a Moment Magnitude of approximately $M_m=7.4$ (Peterson et el. 2008) resulting from a rupture along the Elsinore Fault located approximately 25 miles away. Ground motion parameters for design were generated using the USGS Earthquake Hazards Program online application for US Seismic Design Maps using the site coordinates presented in Section 1.2 of this report (<http://earthquake.usgs.gov/designmaps/us/application.php>).

Our recommendations for seismic design parameters are in accordance with the 2016 California Building Code (CBC) and 2010 ASCE 7 Minimum Design Loads for Buildings and Other Structures. Based on our subsurface investigation and engineering judgement, we recommend the site be classified as Seismic Site Class D. Site Class D is defined as stiff soil with average shear wave velocities within the upper 100 feet between 600 and 1,200 ft/s, an average field standard penetration resistance between 15 and 50 blows/ft, or an average undrained shear strength between 1,000 psf and 2,000 psf.

Seismic design parameters are based on the Site Class D designation and on the site locations with respect to mapped spectral acceleration parameters SS and $S1$. The recommended seismic design parameters are summarized in Table 1.

Table 1
Recommended 2016 CBC Seismic Design Parameters

Design Parameter	Symbol	Recommended Value	2016 CBC (ASCE 7-10) Reference(s)
Site Class	--	D (stiff soil profile)	Section 1613.3.2 (Section 11.4.2)
Mapped MCE_R (5% damped) spectral acceleration for short periods	S_s	0.911 g	Section 1613.3.1 (Section 11.4.1)
Mapped MCE_R (5% damped) spectral acceleration for a 1-sec period	S_1	0.349 g	Section 1613.3.1 (Section 11.4.1)
Short Period Site Coefficient	F_a	1.136	Table 1613.3.3(1) (Table 11.4.1)
Long Period Site Coefficient (at 1-second period)	F_v	1.703	Table 1613.3.3(2) (Table 11.4.2)
Peak Ground Acceleration	PGA	0.251 g	(Section 11.4.5)
MCE_R Peak Ground Acceleration adjusted for site class effects (S_M at $T=0$)	PGA_M	0.251 g	N/A
MCE_R (5% damped) spectral response acceleration for short periods adjusted for site class ($F_a * S_s$)	S_{MS}	1.035 g	Section 1613.3.3 (Section 11.4.3)
MCE_R (5% damped) spectral response acceleration at 1-second period adjusted for site class ($F_v * S_1$)	S_{M1}	0.594 g	Section 1613.3.3 (Section 11.4.3)
Design spectral response acceleration (5% damped) at short periods ($2/3 * S_{MS}$)	S_{DS}	0.690 g	Section 1613.3.4 (Section 11.4.4)
Design spectral response acceleration (5% damped) at 1-second period ($2/3 * S_{M1}$)	S_{D1}	0.396 g	Section 1613.3.4 (Section 11.4.4)

Notes: MCE_R : Risk-Targeted Maximum Considered Earthquake

4.1.4 Liquefaction and Seismically Induced Settlement

The term liquefaction describes a phenomenon in which saturated, cohesionless soils temporarily lose shear strength (liquefy) due to increased pore water pressures induced by strong, cyclic ground motions during an earthquake. Structures founded on or above potentially liquefiable soils may experience bearing capacity failures due to the temporary loss of foundation support, vertical settlements (both total and differential), and undergo lateral spreading. The factors known to influence liquefaction potential include soil type, relative density, grain size, confinement, depth to groundwater, and the intensity and duration of the seismic ground shaking. The soils most susceptible to liquefaction are loose, saturated sands and sandy silts. Liquefaction is most

prevalent in loose to medium dense sandy and gravelly soils below the groundwater table, but can also occur in non-plastic to low plasticity fine-grained soil in areas of high groundwater.

Our borings were advanced to a depth of 20 feet and alluvial soils are anticipated to extend to significant depths. We did not encounter groundwater during our investigation to a maximum depth of 20 feet below grade. However, we reviewed the January 27, 2006 "Supplemental Groundwater Monitoring Report, Fourth Quarter 2005" prepared by Leighton Consulting, Inc. for the San Diego County Department of Public Works Lakeside Road Station. This groundwater monitoring report reported groundwater at approximate elevations 388 to 392 MSL measured within three monitoring wells between October 2004 and November 2005. The Lakeside Road Station site is located approximately 0.5 miles southeast of our project site.

Based on our experience in the project vicinity, nearby approximate groundwater elevations, as well as the presence of deep loose to medium dense coarse-grained material at the site, we estimate that total liquefaction induced settlements may be on the order of 2 to 4 inches. Based on the depth of groundwater over 20 feet, differential settlements should be significantly less than the total settlements and are not considered a significant hazard to the proposed improvements.

4.1.5 Flood and Seiche Hazards

The Federal Emergency and Management Administration (FEMA) maintains a collection of Flood Insurance Rate Maps (FIRM), which cover the entire United States. These maps identify those areas that may be subject to 100-year and 500-year flood events. According to FEMA FIRM 06073C1393G dated May 16, 2017, a majority of the site is located in flood zone A indicating the site is subject to inundation by a 100-year flood event, however, base flood elevations have not been determined. The northeast corner of the site falls within flood zone AE indicating base flood elevations have been determined for this area. The map indicates that the maximum potential base flood level in zone AE could reach an elevation of approximately 416 feet MSL. The potential flood event is due to San Vicente Creek located approximately 350 feet west of the site.

A seiche is an oscillatory wave that develops in an enclosed or partially enclosed body of water, such as a bay or lake, in response to seismic shaking from an earthquake. Review of recent aerial imagery indicates the presence of a small lake located approximately 700 feet south of the site at an elevation approximately 20 feet lower than our site. Due to the distance away from the site and the lower elevation of the lake, the hazard of seiches is considered relatively low.

4.1.6 Landslides

Landslides are deep-seated ground failures (several tens to hundreds of feet deep) in which a large arcuate or block shaped section of a slope detaches and slides downhill. Landslides can cause damage to structures both above and below the slide mass. Several formations within the San Diego region are particularly prone to landslides. These formations generally have high clay content and mobilize when they become saturated with water. Other factors, such as steep dipping bedding that project out of the face of the slope and/or the presence of fracture planes will also increase the potential for a landslide.

Due to the generally level (flat lying) configuration of the site, a deep-seated landslide hazard here is considered negligible. Hillslopes composed of the granitoid rock with steep slope gradients are located approximately 0.3 miles east of the site. Review of geologic maps (Todd 2004, Tan 1992 and 2002), aerial photography (USDA 1953), and our site reconnaissance did not reveal indication of the relatively nearby hillslopes to be affected by a deep-seated landslide. Based on our review, it is our opinion that the hazard with respect to a deep-seated landslide is low.

4.1.7 Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or concrete slabs supported on grade.

A representative sample of the near-surface soils in boring B-2 was tested in accordance with UBC 18-2, "Expansion Potential". The sample of sandy silt was found to have an Expansion Index (EI) of 5 and is considered representative of the material found on the site. According to the 2016 CBC, soils with an EI of 0 to 20 are considered to have a low expansion potential. Further, Atterberg Limits testing on a near-surface sample from boring B-1 resulted in a liquid limit of 31 percent, a plastic limit of 24 percent, and plasticity index of 7 percent. Based on these results and our visual evaluation of soil variability at the site, we anticipate the near-surface soils at the site have a low expansion potential.

4.2 EARTHWORK

4.2.1 Demolition and Site Preparation

The existing fencing and vegetation in the proposed structure footprints should be removed prior to construction. Prior to initiating grading operations, all existing surficial covering, debris, oversized materials (greater than 6 inches), and other deleterious materials within construction areas should be stripped and completely removed from the project site. If existing undocumented fill soils are encountered within the structure footprints, then the undocumented fill should be completely removed prior to the placing of compacted fill to raise grades. Portions of the existing undocumented fill soils that are suitable for reuse as new compacted fill may be stockpiled at approved areas of the site for future use.

Excavations for removal of any man-made structures within the structure footprints, including buried pipes, utilities, and the existing tank encountered at test pit TP-4 within the covered arena footprint, should be replaced with approved compacted fill. Buried pipes outside of the building area should be capped as a minimum; however, they should be evaluated by Kleinfelder on an individual basis during construction for potential additional measures. Excavations for removal of any man-made structures should be dish-shaped to allow for access of compaction equipment and should be properly compacted in accordance with Section 4.2.4 of this report.

4.2.2 Soil Characteristics

The existing undocumented fill soils are considered unsuitable for structural support of floor slabs and foundations. These soils mainly consist of silty sand and sandy silt with zones of gravel, cobble, and debris (fencing, plastic tubing, concrete, and asphalt). These soils are underlain by alluvial deposits which predominately consists of silt, sandy silt, silty sand, and poorly-graded sand. The excavation of these soils should be possible with conventional heavy-duty excavating equipment. Special handling of oversized material in the existing undocumented fills should be planned.

4.2.3 Remedial Earthwork

As previously discussed, existing undocumented fills and alluvial deposits are considered unsuitable for structural support of floor slabs and foundations for the proposed structures in their current condition. We recommend that the fill soils be completely excavated from within structural footprints, stripped of oversized material, debris, and other deleterious material. The undocumented fill and the upper portion of alluvial soil should be recompacted as engineered fill

to a minimum depth of 3 feet below shallow foundations, concrete slabs and floor slabs and a minimum depth of 12 inches in the DG parking area. These soils should be compacted to a relative compaction of at least 90 percent per ASTM D1557 per Section 4.2.4 of the report.

4.2.4 Engineered Fill

The majority of soils excavated from the site may be used as engineered fill, provided that they are free of oversized materials, organic materials, expansive clay, and deleterious debris. Oversize material in excess of 6 inches in diameter should not be used in structural fill and material larger than 3 inches should not be used within the upper 3 feet of structural (foundations, parking, etc.) subgrades. The upper 6 inches of on-site structural fill below the slab materials should have an expansion index (EI) of less than 20 as evaluated by ASTM D4829. The expansion result on a representative sample of the on-site soils indicates that the on-site soils meet this criterion.

Import materials used as structural fill (if any) should have an expansion index less than 30, a minimum R-value of 20, less than 30 percent of the particles passing the No. 200 sieve, and have a maximum particle size of 3 inches in dimension. Import materials placed within the upper 6 inches below the slab materials should have an expansion index (EI) of less than 20.

Approved on-site and import soils placed as structural fill should be moisture conditioned between optimum and 3 percent above optimum moisture content and compacted to a minimum of 90 percent of the maximum dry density in accordance with ASTM D1557. The maximum lift thickness for fill soils will be dependent on the type of compaction equipment utilized. Approved engineered fill should generally be placed in uniform lifts not exceeding approximately 8 in loose thickness.

Approved engineered fill used in non-structural areas should be moisture conditioned to between 0 and 2 percent above optimum moisture content and compacted to a minimum of 90 percent of the ASTM D1557 maximum dry density.

4.2.5 Subgrade Preparation

Undocumented fill was encountered in test pit TP-4, located in the covered arena footprint, to a depth of 2 feet below grade and in test pit TP-6, located in the DG parking area, to the termination depth of 4 ¾ feet below grade. All undocumented fill in structural areas should be completely removed and either replaced and/or recompacted in accordance with Section 4.2.4 of this report. The upper portion of loose and dry alluvial soils should also be removed and recompacted within

structural areas. All undocumented fill and alluvial soil in non-structural areas should be scarified to a depth of 12 inches, moisture conditioned and recompact. The DG and the upper 12 inches of subgrade in the DG parking area should be compacted to a relative compaction of at least 95 percent per ASTM D1557

All site preparation and fill placement activities should be observed and tested by a representative of our firm. All subgrade areas should be proofrolled/compacted and approved by the Contractor's geotechnical representative prior to the pouring of concrete and placement of new fill.

4.2.6 Temporary Excavations

Shallow, temporary utility trench excavations are anticipated at the site. Additionally, excavations will be required to remove undocumented fill from the building footprints. If very steep or vertical excavations are required in excess of 4 feet in depth, we recommend the sidewalls be laid back or shored in accordance with the U.S. Occupational Safety and Health Administration (OSHA) standards. If necessary, the contractor should be responsible for the structural design and safety of temporary shoring systems and we recommend that this design be submitted to Kleinfelder for review and approval

For preliminary planning, the on-site fill and alluvial deposits can be classified as OSHA Type C soil for evaluating OSHA sloping requirements. The actual OSHA soil type should be determined by the contractor's competent person in the field at the time of construction based on the exposed conditions observed in the field. Type CB soils should have 1.5H:1V temporary construction excavation slopes up to 20 feet in height. If stability of an excavation becomes questionable during construction, we recommend the excavation should be evaluated promptly by Kleinfelder.

No surcharge loads, such as the weight from construction equipment or soil stockpiles, should be placed within 10 feet from the top of open excavations. Construction personnel should be aware that soil conditions may change rapidly if soil moisture conditions change or if soils that have been disturbed by previous excavations are encountered. All surface water should be diverted away from open excavations.

4.2.7 Pipe Bedding and Trench Backfill

Pipe bedding should consist of granular material having a sand equivalent value of 30 or more. The sand should be placed in a zone that extends a minimum of 3 inches below and 12 inches above the pipe for the full trench width. The bedding material should be compacted to a minimum of 90 percent of the maximum dry density in accordance with ASTM D1557. Trench backfill above

pipe bedding may consist of approved, on-site or import soils placed in lifts no greater than 8 inches in loose thickness and compacted to 90 percent of the maximum dry density. Backfill should not contain material greater than 3 inches in size. Sand cement slurry is an acceptable alternative to soil backfill, provided it contains a minimum of 2 sacks of cement per cubic yard of sand.

4.2.8 Erosion Prevention and Sedimentation Control

The potential for soil erosion is largely impacted by local soil characteristics, vegetative cover, topographic relief, and the frequency and intensity of rainfall and wind. Removal of vegetation and disturbance to surficial soils by construction activities may result in local increases of erosion rates in unprotected areas. As a result, sedimentation may increase in local drainages at site perimeters and slope intersections. Uncontrolled diversion of storm water runoff from the site to unlined drainage channels could result in extensive erosion due to concentrated flow. This is particularly true during and immediately following site grading.

Site development normally increases the amount of impervious area, thus increasing the volume of storm water runoff. Concentration of flow in drainage structures can result in increased flow velocities and erosion potential. Soils on slopes exposed by site development will be subject to erosion by wind and water. This can result in increased turbidity of runoff to the downstream area.

Erosion prevention and sedimentation control is a complex issue and is usually best addressed by sound planning and the use of Best Management Practices (BMPs). Erosion control BMPs are the “best” available technologies that are consistent with conventional local control practices. Implementation is dependent on site conditions and applicability of proven cost-effective methods. The selection and implementation of construction BMPs is dependent on what existing features need to be protected or mitigated.

BMPs for erosion and sediment control are selected to meet the specific objectives based on site conditions, serviceability, and cost. Various BMPs in combination or succession may be needed for a given area. Selection of erosion control BMPs should be based on minimizing disturbed areas, stabilizing disturbed areas, and protecting slopes and channels. It also should be based on retaining sediment on-site and controlling the site perimeter. All implemented BMPs should be regularly monitored and controlled after initial installation, as well as during and after any storm generating runoff, to determine maintenance requirements and the general condition of the installed system.

To reduce soil erosion and sediment transport, protective material such as gravel, crushed stone, and other effective erosion control materials should be used to stabilize exposed soils. Slopes should be provided with temporary drainage and erosion control measures during construction until permanent measures can be installed. Storm water runoff from construction areas should be conveyed to temporary diked detention areas for sediment deposition, then discharged to the existing natural drainage courses with velocities slow enough to prevent further erosion in the drainage courses.

Control of erosion and sedimentation on recently graded construction sites require both vegetative and structural measures. Vegetative species used to control erosion should be selected to accommodate the soil characteristics and climate at the site. Storm runoff control should be provided during and after completion of site grading by using diversion dikes and permanent drainage facilities. Sediment retention structures such as sediment basins, sediment traps, or silt fences should be used to keep eroded material on the site. Straw bales used alone, or in combination with geotextiles, can be effective sediment retention structures when properly installed and maintained.

We recommend the following practices be part of the project:

- Use temporary plant cover, mulching, and/or structures to control runoff and protect areas subject to erosion during construction.
- Minimize soil exposure during the rainy season by proper timing of grading and construction and be prepared to shut down all earthwork if heavy precipitation occurs.
- Have erosion control equipment and materials onsite if needed in an emergency to quickly construct temporary collectors, diversion channels, intercept drains, berm, dikes, or filters.
- Accommodate the surface runoff from all disturbed areas. Prepare drainage-ways that handle concentrated or increased runoff from disturbed areas by using riprap or other lining materials to control erosion.
- Trap sediment-laden runoff in basins to allow soil particles to settle out before flows are released to receiving waters.
- Reduce erosion by limiting the area and time of exposure, and by the provision of diversion channels.

4.2.9 Site Drainage

Final elevations at the site should be planned so that positive drainage is established around structures such that surface water runoff is directed away from building foundations, floor slabs,

parking areas, and other proposed elements of the project. Positive drainage is defined as a slope of 2 percent or more for a distance of 5 feet away from structure. Roof gutters and downspouts should be installed on structures. Downspouts should discharge to controlled drainage systems. Parking areas should be sloped and drainage gradients maintained to carry surface water away from structural foundations.

4.2.10 Construction Observation

The earthwork recommendations presented in this report are based on our understanding of the proposed project and anticipated site conditions. The interpolated subsurface conditions should be evaluated by Kleinfelder personnel in the field during construction. Final project drawings and specifications should be reviewed by Kleinfelder prior to the commencement of construction so that the recommendations given in this report can be re-evaluated based on changes in site grading and configuration. We should continuously observe the clearing/grubbing, earthwork/grading, foundation excavation/preparation, and trench backfilling operations. Such observations are considered essential to identify field conditions that differ from those anticipated, to adjust designs to actual field conditions and to determine that the grading is accomplished in general accordance with the recommendations of this report. Recommendations presented herein are contingent on Kleinfelder performing such services.

4.3 STORMWATER INFILTRATION STUDY

We have evaluated the site in conformance with the 2016 County of San Diego BMP Design Manual for Permanent Site Design, Storm Water Treatment and Hydromodification Management (The Manual). For the purpose of this report, infiltration is defined as the flow of water through the ground surface and percolation is defined as the downward flow of water through the subsurface soil layers. Infiltration may be controlled primarily by factors such as the type and porosity of the surface filtering media, maintenance of these media, surface slopes, surface vegetation, and intensity, duration, and type of precipitation. Percolation may be controlled primarily by the subsurface conditions and properties such as soil grain size, density, layering, porosity, hydraulic head, and proximity the groundwater. Surface drainage and maintenance will largely determine the site's infiltration rate and the amount of water that will infiltration for any given storm. The percolation rate will depend locally on the soil layering and will be controlled by the finer-grained soils.

Borehole percolation testing was the selected method for field infiltration testing at the site. Two percolation tests were performed at two different locations. The percolation tests were performed

in general accordance with those set forth in California Test 750. The tests were performed in drilled boreholes advanced to a depth of 5 feet below existing grade. The measured percolation rates have been converted to an adjusted short term infiltration rate based on the borehole geometry using the Porchet Method (Ritzema, 1994) and are presented in Table 2. These values are converted to long term design infiltration rates by using correction factors based on Form I-8 of the BMP Design Manual.

Table 2
Summary of Adjusted Infiltration Rates

Boring	Tested Depth from Ground Surface (feet)	Adjusted Short Term Infiltration Rate (inch/hour)	Soil Description
PERC-1	0-5	0.31	Silty Sand
PERC-2	0-5	0.11	Sandy Silt

Note that relatively clean water was used to perform the tests above. However, surface runoff water from the site would likely contain silt, clay, and/or other materials that would eventually decrease the percolation rates. The provided field percolation rates in Table 2 do not include reduction factors for long term performance. These values are converted to long term design infiltration rates in the following sections by using correction factors based on Form I-9 of the BMP Design Manual.

Based on visual soil classifications and laboratory sieve analyses of soil samples collected during our field exploration at the percolation test locations, subsurface materials mostly consist of silty sand and sandy silt within the depths of the test. The results are presented on the boring logs and lab results in Appendix A and Appendix B, respectively.

4.3.1 Mitigation Measures

The following bullets present typical considerations (geotechnical and other) for implementation of infiltration systems, along with a discussion of site specific conditions related to these considerations.

- Presence of fill soils below building footprints: The areas of infiltration should be located away from proposed foundation areas. Infiltrated water near building foundations can induce settlement of fill and reduction in bearing pressure below building foundations which can adversely impact the building.

- Presence of shallow rock: Infiltration would be impeded if bedrock is located near the surface. However, shallow rock was not encountered during our investigation and is not a concern.
- Building sites located adjacent to or within landslide hazard areas or hillside grading areas: This site is not located near landslide hazard areas.
- Sites with initial seasonal high groundwater elevation within 10 feet of the invert of a proposed basin: Groundwater was not encountered during our investigation to a maximum depth of 20 feet below grade and is not within 10 feet of the proposed basins.
- Site soils with a potential for liquefaction: Due to the presence of loose granular material at the site, and the assumed groundwater elevation based on nearby groundwater level readings, the site is potentially liquefiable. Infiltration into these granular materials may increase the potential for liquefaction to occur at the site during a seismic event. However, the impact is not significant enough at the site to warrant mitigation measures.
- Site soils with a moderate or high expansion potential: Based on the laboratory test results, the observed site soils appear to have a low expansion potential.
- Sloping sites: Infiltration into sloped areas could result in infiltration into differing subsurface conditions. However, the proposed retention basin is located at a relatively flat portion of the site.
- Sites with soil and/or groundwater contamination: No known contamination is present near the site.

4.3.2 Data Evaluation

The results of the field percolation testing program provide a long-term design infiltration rate based on correction factors contained within Tables D.5-1 and D.5-2 of the 2016 BMP Design Manual. These tables are summarized in Tables 3 and 4 below.

Table 3
Suitability Assessment Related Considerations for Infiltration Facility Safety Factors*

Consideration	High Concern (3 Points)	Medium Concern (2 Points)	Low Concern (1 Point)
Assessment methods (see explanation below)	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates Use of well permeameter or borehole methods without accompanying continuous boring log Relatively sparse testing with direct infiltration methods	Use of well permeameter or borehole methods with accompanying continuous boring log Direct measurement infiltration area with localized infiltration measurement methods (e.g., infiltrometer) Moderate spatial resolution	Direct measurement with localized (double-ring infiltrometer & borehole) infiltration testing methods at relatively high resolution or Use of extensive test pit infiltration measurement methods (Extensive refers to large excavation, filling with water and monitoring drawdown – ideally 30 to 100 square feet)
Texture Class	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site soil variability	Highly variable soils indicated from site assessment, or unknown variability	Soil borings/test pits indicate moderately homogeneous soils	Soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<5 ft below facility bottom	5-15 ft below facility bottom	>15 below facility bottom

*As presented in Table D.5-1 in Appendix D on page D-13 of BMP Design Manual

Table 4
Design Related Considerations for Infiltration Facility Safety Factors*

Consideration	High Concern (3 Points)	Medium Concern (2 Points)	Low Concern (1 Point)
Level of pretreatment/ expected influent sediment loads	Limited pretreatment using gross solids removal devices only, such as hydrodynamic separators, racks and screens AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pretreatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be moderate (e.g., low traffic, mild slopes, stabilized pervious areas, etc.).	Excellent pretreatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops/non-sanded road surfaces.
Redundancy / resiliency	No "backup" system is provided; the system design does not allow infiltration rates to be restored relatively easily with maintenance.	The system has a backup pathway for treated water to discharge if clogging occurs <u>or</u> infiltration rates can be restored via maintenance.	The system has a backup pathway for treated water to discharge if clogging occurs <u>and</u> infiltration rates can be relatively easily restored via maintenance.
Compaction during construction	Construction of facility on a compacted site or increased probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Equipment traffic is effectively restricted from infiltration areas during construction and there is low probability of unintended/ indirect compaction.

*As presented in Table D.5-2 in Appendix D on page D-14 of BMP Design Manual

4.3.3 Design Infiltration Rates

Based on our evaluation of the percolation test data, the soils encountered exhibit infiltration rates for *short-term, non-factored infiltration rates between 0.31 and 0.11 inch/hour*. The long-term design infiltration rate was calculated by using the following correction factors based on Form I-9 of the BMP Design Manual. The completed forms are presented in Appendix C. Long-term design infiltration rates have been estimated for PERC-1 and PERC-2 and the values are presented in Table 5.

Table 5
Design Infiltration Rates*

Boring	Safety Factor	Long Term Design Infiltration Rate (Inch/hour)
PERC-1	2.6	0.12
PERC-2	2.6	0.04

*Form I-8 of each borehole is presented in Appendix C

4.3.4 Recommendations and Conclusions

Based on the testing performed and the correction factors presented above, we recommend a combined safety factor of 2.6 for locations PERC-1 and PERC-2.

Based on the completed Categorization of Infiltration Feasibility Condition Form I-8 contained in the BMP Design Manual, we classify the site as a feasibility screening category of "Partial Infiltration". Partial infiltration is suggested since long term infiltration rates are above 0.01 inches/hour and well below 0.5 inches/hour. The completed Form I-8 worksheets for each percolation test location performed at the site are included in Appendix C of this report.

4.4 FOUNDATIONS

4.4.1 Shallow Foundations

Shallow spread and/or continuous foundations bearing on new structural fill are considered feasible for support of the proposed structures at the site. At the time of this report, finished floor elevations and structural loads have not been provided to us.

The existing undocumented fill at the site is considered unsuitable for support of foundation loads in their current conditions. Therefore, we recommend that the existing fill at the site be completely removed within the structure footprints. We also recommend that the alluvial soils within 3 feet below the bottom of foundation be excavated and recompact within structure footprints.

Shallow foundations bearing on approved structural fill may be designed using an allowable bearing pressure of 2,000 pounds per square foot (psf). This design value can be increased by one-third for short term loads such as those due to wind and seismic forces. Total settlements may be on the order of 1 inch. All footings must have a minimum width and embedment of 1 foot.

Resistance to horizontal loadings can be developed by passive earth pressure on the sides of footings and frictional resistance developed along the footing bottoms. Passive resistance to

lateral earth pressure may be calculated using an equivalent fluid unit weight of 250 pcf for shallow footing embedded in the structural fill or alluvial deposits. A friction coefficient of 0.30 may be applied to vertical dead loads supported by approved structural fill or alluvial deposits. If friction is used in combination with passive pressure, then the friction coefficient should be reduced to 0.15.

Footings may experience a reduction in bearing capacity, or an increased potential to settle, when located in close proximity to existing or future utility trenches. Furthermore, stresses imposed by footings on the utility lines may cause cracking, collapse, and/or loss of serviceability. To reduce this risk, utility excavations should not extend below a 2H:1V plane projected downward from 1 foot above the bottom of the outside edge of the footing. Also, no parallel utility excavations should be made within a lateral distance of 2 feet outside the footing.

Prior to placing reinforcing steel or concrete, footing excavations should be cleaned of all debris, loose or soft soil, and water. All footing excavations should be observed by an engineer or an engineering technician under the direction of the project geotechnical engineer prior to placement of reinforcing steel and concrete to check that the recommendations contained herein are implemented during construction.

4.4.2 Foundations for Canopies and Free-Standing Poles

We understand that the arena located at the east portion of the site will be covered by a canopy supported by canopy pole foundations. No foundation loads have been provided to us at the time of this report, however, due to potential uplift and lateral loads associated with the canopy foundations, it is our experience that Cast-In-Drilled Hole (CIDH) concrete pile foundations are likely preferable to shallow foundations. This foundation system may also be utilized for free standing light poles or sign posts.

Based on the subsurface conditions encountered at the site, we anticipate the canopy pole foundations will primarily bear in the young alluvial deposits. Therefore, we recommend using Class 5 Material as defined by California Building Code, Table 1806.2, 2016 Edition. The presumptive values in Table 1806.2 provide a vertical foundation pressure of 1,500 psf and a lateral bearing pressure of 100 psf/ft. The recommended capacities for the canopy poles are presented in Table 6 below assuming a pile diameter of 18 and 24 inches. Should larger lateral capacities be required, larger diameter piles or deeper embedments may be utilized. The methodology presented in the 2016 CBC Section 1807.3 was used to evaluate the design capacities.

Table 6
Pole Foundation Design Capacities

Pile Diameter (inches)	Embedment Depth (ft.)	Moment (M_g) (kip-ft.)	Vertical Bearing Capacity (psf)	Cohesion (psf)
18	6	7.6	1,500	130
	8	18.1		
	10	35.3		
24	6	10.2		
	8	24.1		
	10	47.1		

Nearby excavations, temporary shoring, or retaining walls may impact the lateral resistance for the canopy pole foundations. Kleinfelder should be notified of any proposed improvements near the proposed canopy pole locations. Additional analyses may be required depending on distance and depth of the improvements.

4.5 CONCRETE SLAB-ON-GRADE FLOORS

Based on the encountered subsurface conditions, we recommend concrete slab-on-grade floors be supported on new structural fill (i.e. all existing undocumented fill soils and the upper 24 inches of alluvial soils have been completely removed and replaced with properly compacted structural fill). The fill should be moisture conditioned to about 3 percent above optimum, and compacted to at least 90 percent the relative compaction per ASTM D1557. Subgrade soil supporting floor slabs should be prepared in accordance with the recommendations in Section 4.2.6 of this report. We recommend a modulus of subgrade reaction, k , of 150 pci to be used in design of the floor slabs on approved, compacted subgrades.

Special precautions should be taken during the placement and curing of all concrete slabs. Excessive slump (high water-cement ratio) of the concrete and/or improper curing procedures used during either hot or cold weather conditions could lead to excessive shrinkage, cracking, or curling of the slabs. High water-cement ratio and/or improper curing may also greatly increase the water vapor permeability of concrete. We recommend that all concrete placement, joint spacing, and curing operations be performed in accordance with the recommended guidelines of the American Concrete Institute (ACI).

Floor slabs for enclosed structures such as restrooms should be underlain by at least 4 inches of clean, coarse sand or fine gravel to provide a capillary moisture break and uniform support to the slab. In cases where the floor may have a vapor/moisture sensitive covering (e.g. tile, linoleum, carpet, wood), may be in a humidity controlled environment, or may likely have one or both of these conditions in the future, we recommend a 10-mil visqueen vapor barrier be utilized between the prepared subgrade and the bottom of the floor slab.

4.6 EXTERIOR CONCRETE FLATWORK

Flatwork and exterior concrete should be supported on at least 12 inches of compacted, low to very low expansive engineered fill. Particles in excess of 3 inches within the upper 12 inches of the subgrade should be removed. The concrete slabs for walkways and sidewalks should have a nominal thickness of 4 inches. The exposed subgrades should scarified to a depth of 6 inches, uniformly moisture conditioned to between optimum and 3 percent above optimum moisture content, and compacted to at least 95 percent relative compaction as per ASTM D1557. Loose or yielding subgrade identified during earthwork operations may require additional remedial measures. Positive drainage should be established and maintained adjacent to flatwork.

4.7 PRELIMINARY CORROSIVE SOIL SCREENING

Preliminary laboratory corrosive soil screening of the on-site soils was performed on a near surface sample from boring B-2 to evaluate the potential effect on concrete and ferrous metals. The results of the testing are presented in Appendix B and indicate a minimum resistivity of 1,900 ohm-cm, a pH value of 8.7, a sulfate concentration of 110 ppm, and a chloride concentration of 43 ppm.

The minimum electrical resistivity tests performed indicated that the soil is considered to be corrosive to buried unprotected metal objects based on the 1984 National Association of Corrosion Engineers (NACE) correlation between soil resistivity and corrosivity towards unprotected ferrous metals presented in Table 7.

Table 7
Electrical Resistivity and Unprotected Ferrous Metals Corrosion Potential

Minimum Electrical Resistivity, ohm-cm	Corrosion Potential
0 to 1,000	Severely Corrosive
1,000 to 2,000	Corrosive
2,000 – 10,000	Moderately Corrosive
Over 10,000	Mildly Corrosive

In general, Caltrans considers the subsurface conditions at a site to be aggressive to below-grade concrete if one or more of the following conditions exist for the representative soil samples taken at the site: chloride concentration is 500 parts per million (ppm) or greater, sulfate concentration is 2,000 ppm or greater, or the pH is 5.5 or less.

The Portland Cement Association (1988), correlates sulfate content to sulfate attack potential as presented in Table 8.

Table 8
Sulfate Attack Potential

Sulfate Content (ppm)	Sulfate Attack Potential
0 to 1,000	Negligible
1,000 to 2,000	Moderate
2,000 – 20,000	Severe
Over 20,000	Very Severe

Based on the Caltrans and Portland Cement Association criteria, the onsite soils may be considered to have a negligible sulfate attack potential and are considered to be not aggressive to below-grade concrete. Based on these test results, Type II cement may be suitable for design of concrete elements.

Preliminary corrosion tests are only an indicator of potential soil aggressivity for the sample tested. We recommend that the corrosion test results be reviewed and evaluated by the project designers considering the proposed improvements and project lifespan requirements. Kleinfelder does not practice corrosion engineering and the purpose of our tests is only to provide a preliminary screening. Additional sampling and testing may be performed after completion of grading for the proposed site improvements. A qualified corrosion engineer should be contacted for detailed evaluation of corrosion potential with respect to construction materials at this site and the proposed design.

5 LIMITATIONS

This report has been prepared for the exclusive use of San Diego County Department of Parks and Recreation and their consultants for specific application to the subject project. The findings, conclusions, and recommendations presented in this report were prepared in accordance with generally accepted geotechnical engineering practice. No warranty, express, or implied is made.

The scope of services was limited to the field exploration program described in this report. It should be recognized that definition and evaluation of subsurface conditions are difficult. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. The conclusions presented herein are based on field explorations, laboratory testing, engineering analyses, and professional judgement.

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining levels of service, which provide information for their purposes at acceptable levels of risk. The client and their consultants should discuss the issues addressed in this report with Kleinfelder, so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk, and expectations for future performance and maintenance.

Recommendations contained in this report are based on our field observations and subsurface explorations, laboratory tests, and our understanding of the proposed construction. It is possible that soil or groundwater conditions could vary between or beyond the points explored. If soil or groundwater conditions are encountered during construction that differ from those described herein, the client is responsible for ensuring that Kleinfelder is notified immediately so that we may re-evaluate the recommendations of this report. If the scope of the proposed construction or locations of the improvements change from those described in this report, then the conclusions and recommendations contained in this report are not considered valid until the changes are reviewed and the conclusions of this report are modified or approved in writing by Kleinfelder.

Our geotechnical scope of services for this subsurface exploration and geotechnical report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this site. Kleinfelder cannot be responsible for interpretation by others of this report or the conditions

encountered in the field. Kleinfelder must be retained so that all geotechnical aspects of construction can be monitored on a full-time basis by a representative from Kleinfelder, including site preparation, preparation of foundations, and placement of engineered fill and trench backfill. These services provide Kleinfelder the opportunity to observe the actual soil and groundwater conditions encountered during construction and to evaluate the applicability of the recommendations presented in this report to the site conditions. If Kleinfelder is not retained to provide these services, we will cease to be the engineer of record for this project and will assume no responsibility for any potential claim during or after construction on this project. If changed site conditions affect the recommendations presented herein, Kleinfelder must also be retained to perform a supplemental evaluation and to issue a revision to our original report.

This report, and any future addenda or reports regarding this site, may be made available to bidders to supply them with only the data contained in the report regarding subsurface conditions and laboratory test results at the point and time noted. Bidders may not rely on interpretations, opinion, recommendations, or conclusions contained in the report. Due to the limited nature of any subsurface study, the contractor may encounter conditions during construction which differ from those presented in this report. In such event, the contractor should promptly notify the owner so that Kleinfelder's geotechnical engineer can be contacted to confirm those conditions. We recommend the contractor describe the nature and extent of the differing conditions in writing and that the construction contract include provisions for dealing with differing conditions. Contingency funds should be reserved for potential problems during earthwork and foundation construction.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance, but in no event later than one year from the date of the report. Land use, site conditions, or other factors may change over time, and additional work may be required with the passage of time. Any party, other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of this report and the nature of the new project, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

Kleinfelder will assume no responsibility or liability whatsoever for any claim, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials. Additional important information about this report is presented in the attached Geotechnical Business Council insert in Appendix D.

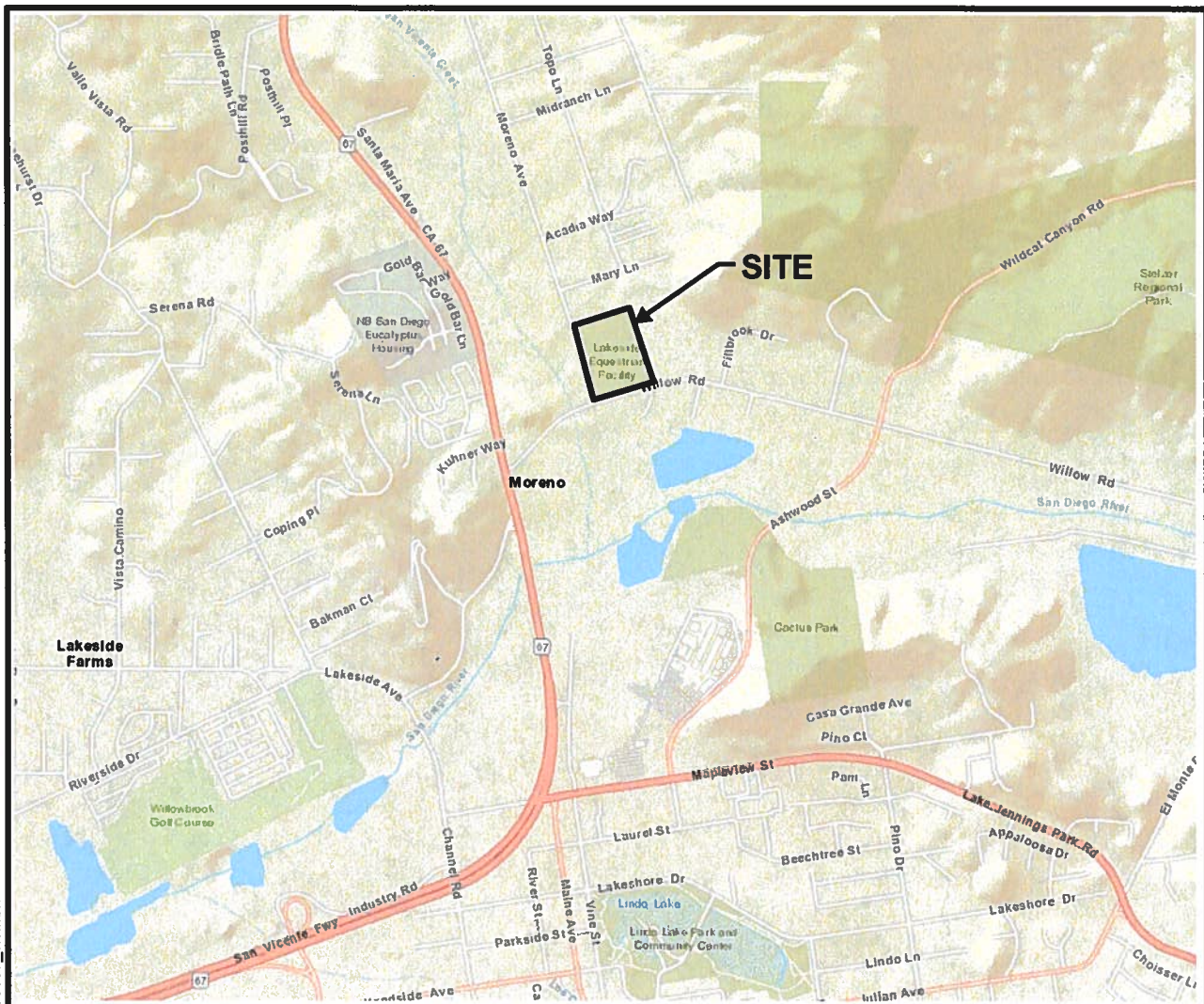
6 REFERENCES

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FIGURES

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PROJECT NO.	20180057
DRAWN:	6/5/2017
DRAWN BY:	JP
CHECKED BY:	JB
FILE NAME:	20180057_vic.mxd

SITE VICINITY MAP

LAKESIDE EQUESTRIAN FACILITY
SAN DIEGO COUNTY PARKS AND RECREATION
WILLOW ROAD AND MORENO AVENUE
LAKESIDE, CALIFORNIA

FIGURE

1

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LEGEND

- APPROXIMATE LOCATION OF PERCOLATION TEST
- APPROXIMATE LOCATION OF SOIL BORING
- APPROXIMATE LOCATION OF TEST PIT



PROJECT NO. 20180057
DRAWN: 6/5/2017
DRAWN BY: JP
CHECKED BY: JB
FILE NAME:
20180057_SITE.mxd

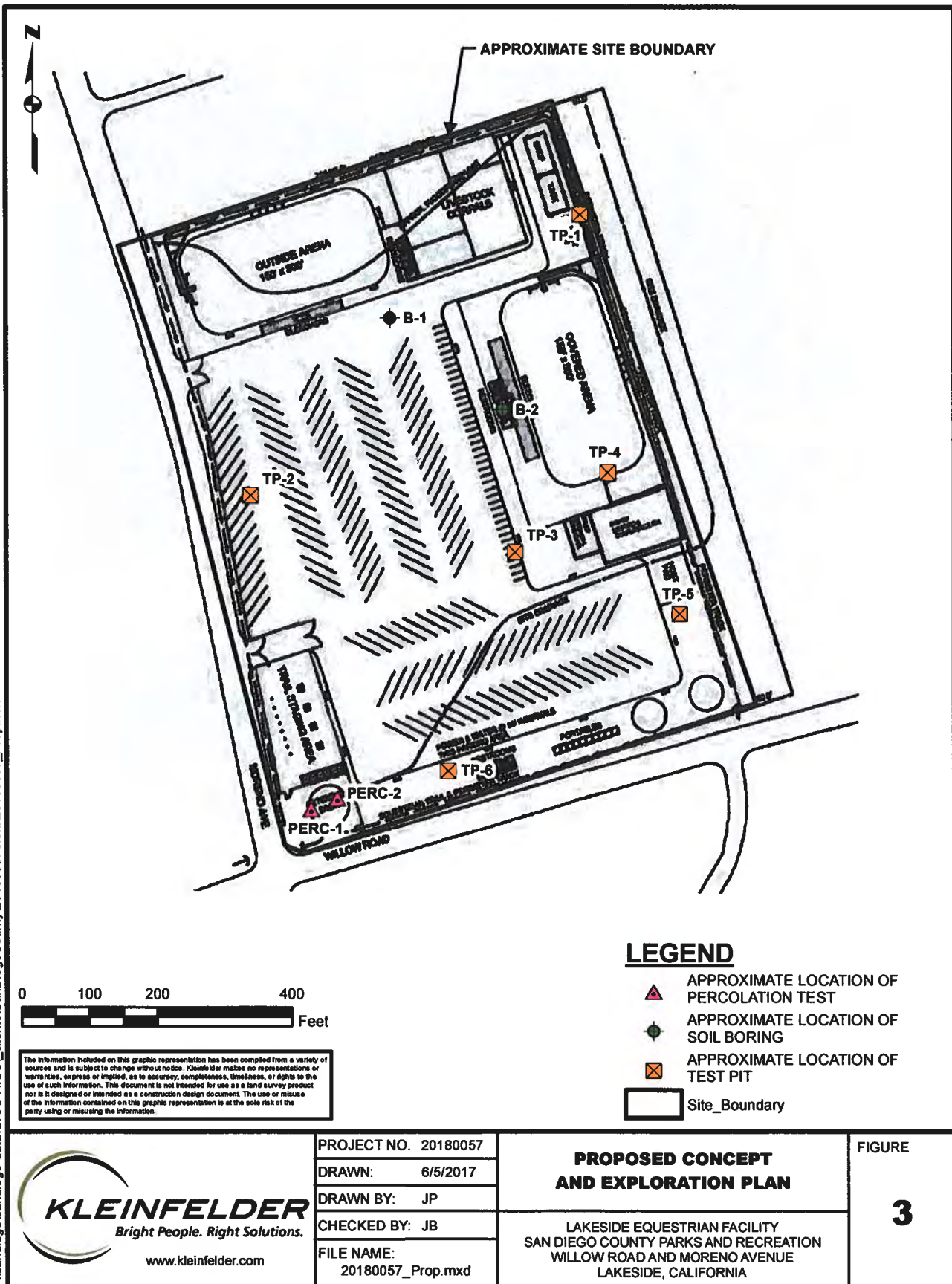
EXISTING SITE CONDITIONS AND EXPLORATION PLAN

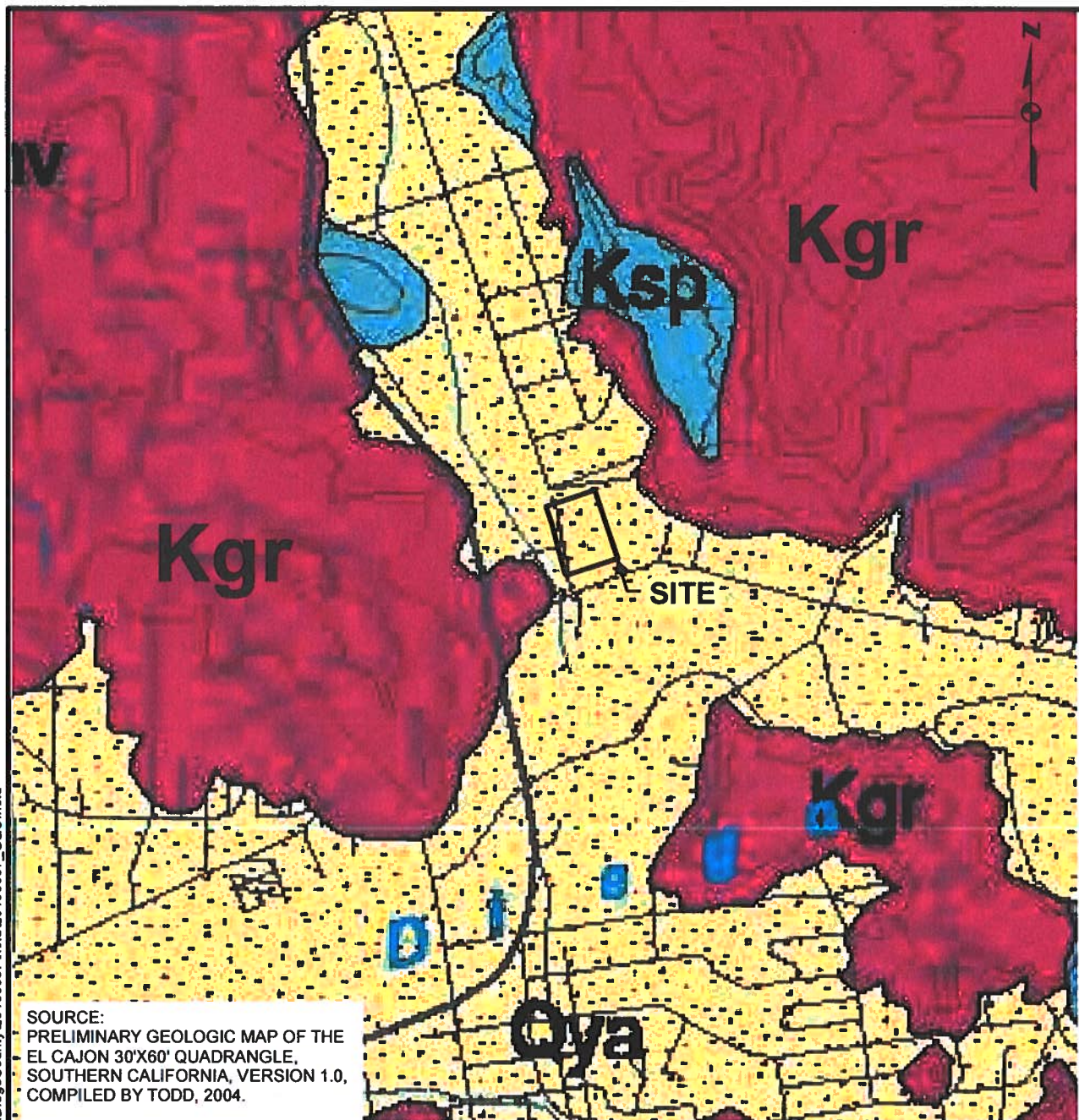
LAKESIDE EQUESTRIAN FACILITY
SAN DIEGO COUNTY PARKS AND RECREATION
WILLOW ROAD AND MORENO AVENUE
LAKESIDE, CALIFORNIA

FIGURE

2

\\sandiego\sdiego-data\GRAPHICS\clients\SanDiegoCounty\20180057\mxd\20180057_Prop.mxd








SOURCE:
PRELIMINARY GEOLOGIC MAP OF THE
EL CAJON 30'X60' QUADRANGLE,
SOUTHERN CALIFORNIA, VERSION 1.0,
COMPILED BY TODD, 2004.

0 1,000 2,000 4,000 Feet

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LEGEND

-  Qya - YOUNG ALLUVIUM (HOLOCENE)
-  Kgr - GRANITOID ROCKS (EARLY CRETACEOUS)
-  Ksp - SANTIAGO PEAK VOLCANICS (EARLY CRETACEOUS)



PROJECT NO. 20180057
DRAWN: 6/5/2017
DRAWN BY: JP
CHECKED BY: JB
FILE NAME:
20180057_GEO.mxd

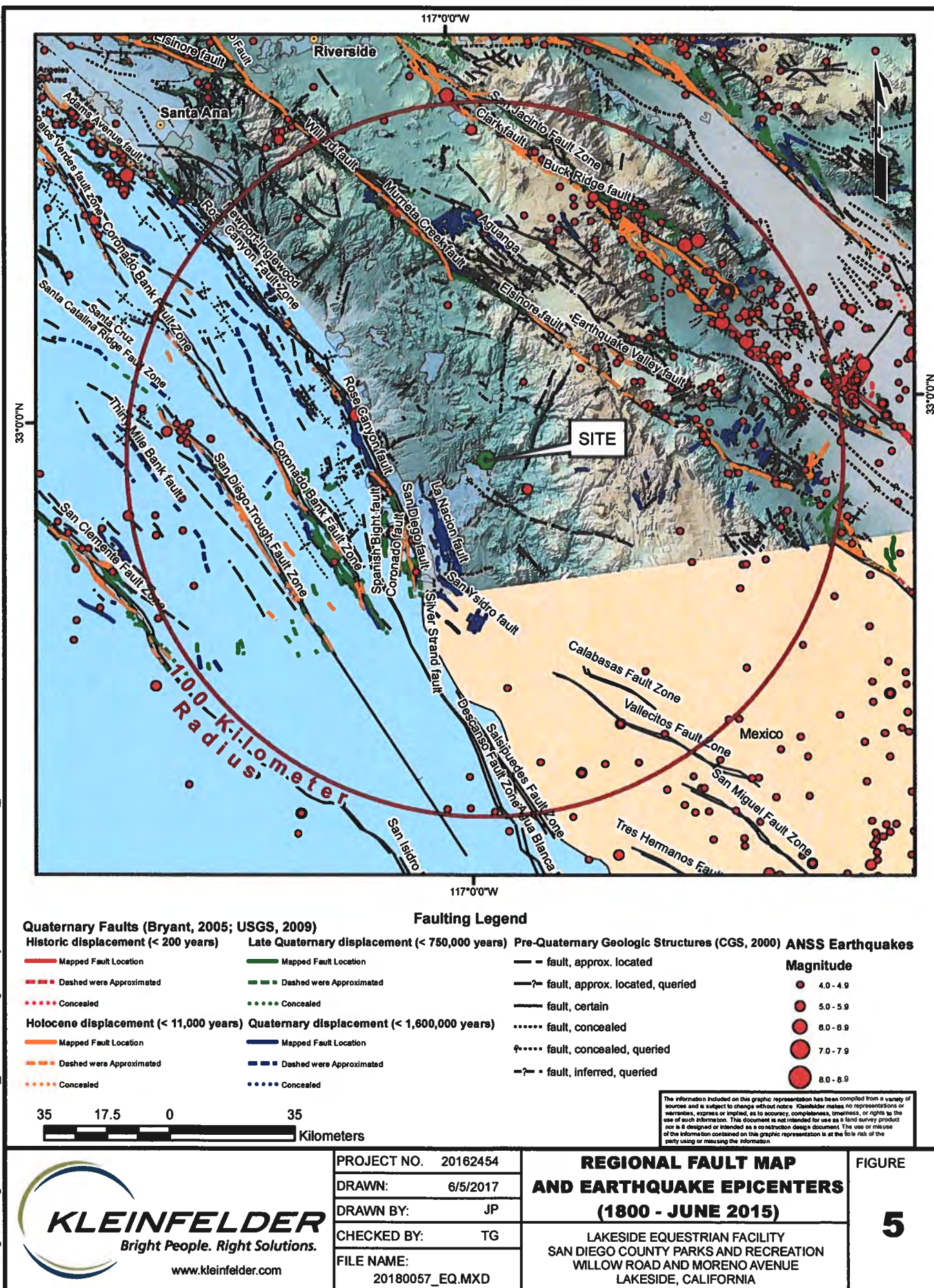
REGIONAL GEOLOGIC MAP

LAKESIDE EQUESTRIAN FACILITY
SAN DIEGO COUNTY PARKS AND RECREATION
WILLOW ROAD AND MORENO AVENUE
LAKESIDE, CALIFORNIA

FIGURE

4

\\san-diego\data\GRAPHICS\clients\SanDiegoCounty\20180057\mxd\20180057_EQ.mxd



APPENDIX A

FIELD INVESTIGATION LOGS

APPENDIX A FIELD INVESTIGATION LOGS

Two borings, seven test pits, and two percolation tests were performed on April 6 and 7, 2017. The approximate investigation locations were determined by measuring from existing site features and are shown on the attached Figures 1 and 2.

The borings, designated as B-1 and B-2, and percolation tests, designated as PERC-1 and PERC-2, were drilled by Pacific Drilling on April 6, 2017. Boreholes were advanced to termination depths of 20 feet below ground surface using a Fraste Multidrill drill rig equipped with 8-inch outer-diameter hollow-stem augers. The percolation tests were each installed at a depth of 5 feet below existing ground surface and offset boreholes were completed at each location to a depth of 10 feet below grade. Our typical vertical sampling interval was approximately five feet. The number of blows required to drive the Modified California sampler was recorded at each sampling location. The samplers and associated rods (threaded) were driven using a 140-pound automatic hammer falling 30 inches. The blow count for each 6-inch interval is recorded on the boring logs. The total number of hammer blows required to drive the SPT sampler the final 12 inches is termed the blow count (or N-value). The blow count values on the boring logs are presented as field values and have not been corrected for the effects such as overburden pressure, sampler size, hammer efficiency, etc.

The test pit excavations, designated as TP-1 through TP-6, were performed on April 6, 2017 by Cut 'n Core using a CAT 430F2 backhoe excavator. The test pits were completed to depths ranging from 2 to 5 feet below ground surface. TP-4 was terminated early due to an encountered obstruction and an offset test pit was performed as TP-4A.

The boreholes and test pits were backfilled using the soil cuttings or excavated soil upon completion of the exploration. An engineer from our office supervised the field operations and logged the borings, percolation tests, and test pits according to the Unified Soil Classification System (USCS). The USCS Soil Classification Chart and key to logs are included as Figures A-1 and A-2. The logs for borings B-1 and B-2 and percolation tests PERC-1 and PERC-2 are included as Figures A-3 through A-6. The logs for test pits TP-1 through TP-6 are included as Figures A-7 through A-13. The boundaries shown between soil types on the logs are approximate as the transition between different soil layers may be gradual. Therefore, variations in the subsurface profile should be anticipated throughout the site. Selected bulk and intact samples were retrieved from the borings and test pits, sealed, and transported to our laboratory for further evaluation and testing.

SAMPLER AND DRILLING METHOD GRAPHICS

	BULK / GRAB / BAG SAMPLE
	MODIFIED CALIFORNIA SAMPLER (2 or 2-1/2 in. (50.8 or 63.5 mm.) outer diameter)
	CALIFORNIA SAMPLER (3 in. (76.2 mm.) outer diameter)
	STANDARD PENETRATION SPLIT SPOON SAMPLER (2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)
	HQ CORE SAMPLE (2.500 in. (63.5 mm.) core diameter)
	SHELBY TUBE SAMPLER
	HOLLOW STEM AUGER
	SOLID STEM AUGER
	WASH BORING
	SONIC CONTINUOUS SAMPLER

GROUND WATER GRAPHICS

	WATER LEVEL (level where first observed)
	WATER LEVEL (level after exploration completion)
	WATER LEVEL (additional levels after exploration)
	OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual or differ from those shown.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, i.e., GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.

ABBREVIATIONS

WOH - Weight of Hammer
WOR - Weight of Rod

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

GRAVELS (More than half of coarse fraction is larger than the #4 sieve)	CLEAN GRAVEL WITH <5% FINES	Cu ≥ 4 and 1 ≤ Cc ≤ 3		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		Cu < 4 and/or 1-Cc > 3		GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
	GRAVELS WITH 5% TO 12% FINES	Cu ≥ 4 and 1 ≤ Cc ≤ 3		GW-GM	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GW-GC	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
		Cu < 4 and/or 1-Cc > 3		GP-GM	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
				GP-GC	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
	GRAVELS WITH > 12% FINES			GM	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
				GC-GM	CLAYEY GRAVELS, GRAVEL-SAND-CLAY-SILT MIXTURES
COARSE GRAINED SOILS (More than half of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH <5% FINES	Cu ≥ 6 and 1 ≤ Cc ≤ 3		SW	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		Cu < 6 and/or 1-Cc > 3		SP	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
	SANDS WITH 5% TO 12% FINES	Cu ≥ 6 and 1 ≤ Cc ≤ 3		SW-SM	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SW-SC	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
		Cu < 6 and/or 1-Cc > 3		SP-SM	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
				SP-SC	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
	SANDS WITH > 12% FINES			SM	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES
				SC-SM	CLAYEY SANDS, SAND-SILT-CLAY MIXTURES
FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid Limit less than 50)			ML	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				CL-ML	INORGANIC CLAYS-SILTS OF LOW PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
	SILTS AND CLAYS (Liquid Limit greater than 50)			OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
				MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY



PROJECT NO.: 20180057
DRAWN BY: JLB
CHECKED BY: KC
DATE: 4/13/2017
REVISED: -

GRAPHICS KEY

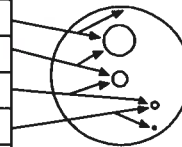
Lakeside Equestrian Facility
Willow Rd and Moreno Ave
Lakeside, California

FIGURE

A-1

GRAIN SIZE

DESCRIPTION	SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders	>12 in. (304.8 mm.)	>12 in. (304.8 mm.)	Larger than basketball-sized
Cobbles	3 - 12 in. (76.2 - 304.8 mm.)	3 - 12 in. (76.2 - 304.8 mm.)	Fist-sized to basketball-sized
Gravel	coarse 3/4 - 3 in. (19 - 76.2 mm.)	3/4 - 3 in. (19 - 76.2 mm.)	Thumb-sized to fist-sized
	fine #4 - 3/4 in. (#4 - 19 mm.)	0.19 - 0.75 in. (4.8 - 19 mm.)	Pea-sized to thumb-sized
Sand	coarse #10 - #4	0.075 - 0.19 in. (2 - 4.9 mm.)	Rock salt-sized to pea-sized
	medium #40 - #10	0.017 - 0.075 in. (0.43 - 2 mm.)	Sugar-sized to rock salt-sized
	fine #200 - #40	0.0029 - 0.017 in. (0.07 - 0.43 mm.)	Flour-sized to sugar-sized
Fines	Passing #200	<0.0029 in. (<0.07 mm.)	Flour-sized and smaller

**SECONDARY CONSTITUENT**

	AMOUNT	
Term of Use	Secondary Constituent is Fine Grained	Secondary Constituent is Coarse Grained
Trace	<5%	<15%
With	≥5 to <15%	≥15 to <30%
Modifier	≥15%	≥30%

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

CONSISTENCY - FINE-GRAINED SOIL

CONSISTENCY	SPT - N_{60} (# blows / ft)	Pocket Pen (tsf)	UNCONFINED COMPRESSIVE STRENGTH (Q_u) (psf)	VISUAL / MANUAL CRITERIA
Very Soft	<2	PP < 0.25	<500	Thumb will penetrate more than 1 inch (25 mm). Extrudes between fingers when squeezed.
Soft	2 - 4	0.25 ≤ PP < 0.5	500 - 1000	Thumb will penetrate soil about 1 inch (25 mm). Remolded by light finger pressure.
Medium Stiff	4 - 8	0.5 ≤ PP < 1	1000 - 2000	Thumb will penetrate soil about 1/4 inch (6 mm). Remolded by strong finger pressure.
Stiff	8 - 15	1 ≤ PP < 2	2000 - 4000	Can be imprinted with considerable pressure from thumb.
Very Stiff	15 - 30	2 ≤ PP < 4	4000 - 8000	Thumb will not indent soil but readily indented with thumbnail.
Hard	>30	4 ≤ PP	>8000	Thumbnail will not indent soil.

FROM TERZAGHI AND PECK, 1948; LAMBE AND WHITMAN, 1969; FHWA, 2002; AND ASTM D2488

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPT- N_{60} (# blows/ft)	MODIFIED CA SAMPLER (# blows/ft)	CALIFORNIA SAMPLER (# blows/ft)	RELATIVE DENSITY (%)
Very Loose	<4	<4	<5	0 - 15
Loose	4 - 10	5 - 12	5 - 15	15 - 35
Medium Dense	10 - 30	12 - 35	15 - 40	35 - 65
Dense	30 - 50	35 - 60	40 - 70	65 - 85
Very Dense	>50	>60	>70	85 - 100

FROM TERZAGHI AND PECK, 1948

STRUCTURE

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. thick, note thickness.
Laminated	Alternating layers of varying material or color with the layer less than 1/4-in. thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.

REACTION WITH HYDROCHLORIC ACID

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

PLASTICITY

DESCRIPTION	LL	FIELD TEST
Non-plastic	NP	A 1/8-in. (3 mm.) thread cannot be rolled at any water content.
Low (L)	< 30	The thread can barely be rolled and the lump or thread cannot be formed when drier than the plastic limit.
Medium (M)	30 - 50	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump or thread crumbles when drier than the plastic limit.
High (H)	> 50	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump or thread can be formed without crumbling when drier than the plastic limit.

ANGULARITY

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.



PROJECT NO.: 20180057
DRAWN BY: JLB
CHECKED BY: KC
DATE: 4/13/2017
REVISED: -

SOIL DESCRIPTION KEY

Lakeside Equestrian Facility
Willow Rd and Moreno Ave
Lakeside, California

FIGURE

A-2

PLOTTED: 06/05/2017 09:59 AM BY: JBonfiglio

PROJECT NUMBER: 20180057.001A
 GINT TEMPLATE: E_KLF_STANDARD_GINT_LIBRARY_2017.GLB
 OFFICE FILTER: SAN DIEGO
 GINT FILE: KLF_gint_master_2017

Date Begin - End: 4/06/2017		Drilling Company: Pacific Drilling		BORING LOG B-1									
Logged By: J. Bonfiglio		Drill Crew: Carlos & Rory											
Hor.-Vert. Datum: Not Available - MSL		Drilling Equipment: Fraste Multidrill XL		Hammer Type - Drop: 140 lb. Auto - 30 in.									
Plunge: -90 degrees		Drilling Method: Hollow Stem Auger											
Weather: Sunny		Exploration Diameter: 8 in. O.D.											


Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS									
			Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks		
			Approximate Ground Surface Elevation (ft.): 412.50 Surface Condition: Bare Earth and Grass													
			Young Alluvial Deposits (Qya) Poorly graded SAND with Silt (SP-SM): fine to medium-grained sand, trace clay, low plasticity, very dark brown (7.5YR-2.5/3), moist													
410																
	5		Sandy SILT (ML): fine to coarse-grained sand, micaceous, low plasticity, strong brown (7.5YR-3/4), moist, soft		BC=4 6 6 PP=0.5	14"			8.4			100	5.6	31	7	Augered to 5 ft; easy augering Bulk sample S1 at 1-5 ft
405									5.4	97.3						MCAL sample 5 to 6.5 ft Direct Shear= Peak Cohesion: 179 psf Peak Friction Angle: 37.0° Augered to 10 ft
	10		Sandy SILT (ML): fine to coarse-grained sand, micaceous, low plasticity, strong brown (7.5YR-3/4), moist, stiff		BC=3 5 8 PP=1.75	14"						99	55			MCAL sample 10 to 11.5 ft Augered to 15 ft
400																
	15		SILT (ML): trace fine-grained sand, micaceous, low plasticity, strong brown (7.5YR-3/4), moist, very stiff		BC=3 4 6 PP=2.25	10"										MCAL sample 15 to 16.5 ft Augered to 18.5 ft
395																
	20		SILT (ML): trace fine-grained sand, trace clay, micaceous, low plasticity, strong brown (7.5YR-3/4), moist, very stiff		BC=2 3 4 PP=2	14"										MCAL sample 18.5 to 20 ft
			The boring was terminated at approximately 20 ft. below ground surface. The boring was backfilled with auger cuttings on April 06, 2017.				GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during drilling or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.									
390																

<p>KLEINFELDER Bright People. Right Solutions.</p>	PROJECT NO.: 20180057	BORING LOG B-1	FIGURE
	DRAWN BY: JLB		
	CHECKED BY: KC		
	DATE: 4/13/2017	Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	A-3
	REVISED: -		PAGE: 1 of 1

PLOTTED: 06/05/2017 10:00 AM BY: JBonfiglio
 PROJECT NUMBER: 20180057.001A
 OFFICE FILTER: SAN DIEGO
 GINT FILE: klf_gint_master_2017
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB
 KLF_BORING/TEST PIT SOIL LOG

Date Begin - End: 4/06/2017		Drilling Company: Pacific Drilling		BORING LOG B-2									
Logged By: J. Bonfiglio		Drill Crew: Carlos & Rory											
Hor.-Vert. Datum: Not Available - MSL		Drilling Equipment: Fraste Multidrill XL		Hammer Type - Drop: 140 lb. Auto - 30 in.									
Plunge: -90 degrees		Drilling Method: Hollow Stem Auger											
Weather: Sunny		Exploration Diameter: 8 in. O.D.											

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS									
			Approximate Ground Surface Elevation (ft.): 412.00 Surface Condition: Bare Earth and Grass	Sample Type	Blow Counts (BC)= Uncorr. Blow/sf in.	Pocket Pen (PP)= tsf	Recovery (NR)=No Recovery	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks	
																Lithologic Description
			Young Alluvial Deposits (Qya) Sandy SILT (ML): fine to medium-grained sand, trace clay, low plasticity, very dark brown (7.5YR-2.5/3), moist													Augered to 5 ft; easy augering Bulk sample S1 at 1-5 ft
410	5		Sandy SILT (ML): fine to medium-grained sand, trace clay, low plasticity, very dark brown (7.5YR-2.5/3), moist, medium stiff Sandy SILT (ML): fine to medium-grained sand, low plasticity, brown (10YR-4/3), moist, very stiff	BC=8 16 20 PP=0.5 PP=2.0	15"											MCAL sample 5 to 6.5 ft Direct Shear= Peak Cohesion: 373 psf Peak Friction Angle: 28.5° Expansion Index= 5 Augered to 10 ft
405	10		SILT (ML): trace fine to medium-grained sand, trace clay, micaceous, low plasticity, very dark brown (7.5YR-2.5/3), moist, soft	BC=6 6 7 PP=0.25	14"											MCAL sample 10 to 11.5 ft Augered to 15 ft
400	15		SILT (ML): trace fine to medium-grained sand, trace to some clay, micaceous, low to medium plasticity, very dark brown (7.5YR-2.5/3), moist, medium stiff	BC=5 6 7 PP=0.5	14"											MCAL sample 15 to 16.5 ft Augered to 18.5 ft
395	20		SILT (ML): trace fine to medium-grained sand, trace clay, micaceous, low to medium plasticity, very dark brown (7.5YR-2.5/3), moist, medium stiff	BC=3 4 4 PP=0.5	14"											MCAL sample 18.5 to 20 ft
390	The boring was terminated at approximately 20 ft. below ground surface. The boring was backfilled with auger cuttings on April 06, 2017.															
GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during drilling or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.																

 Bright People. Right Solutions.	PROJECT NO.: 20180057	BORING LOG B-2 Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	FIGURE A-4
	DRAWN BY: JLB CHECKED BY: KC DATE: 4/13/2017 REVISED: -		PAGE: 1 of 1

PLOTTED: 06/05/2017 10:00 AM BY: JBonfiglio

OFFICE FILTER: SAN DIEGO

PROJECT NUMBER: 20180057.001A

gint FILE: KLF_gint_master_2017
gint TEMPLATE: E_KLF_STANDARD_GINT_LIBRARY_2017.GLB


Date Begin - End: 4/06/2017		Drilling Company: Pacific Drilling		BORING LOG PERC-1	
Logged By: J. Bonfiglio		Drill Crew: Carlos & Rory			
Hor.-Vert. Datum: Not Available - MSL		Drilling Equipment: Fraste Multidrill XL		Hammer Type - Drop: 140 lb. Auto - 30 in.	
Plunge: -90 degrees		Drilling Method: Hollow Stem Auger			
Weather: Sunny		Exploration Diameter: 8 in. O.D.			

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 410.00 Surface Condition: Bare Earth and Grass	Sample Type	Blow Counts (BC)= Uncorr. Blows/6 in. Pocket Pen (PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks	
															Lithologic Description
			Artificial Fill (af) Silty SAND (SM): fine to medium-grained sand, low plasticity, strong brown (7.5YR-3/4), moist												Augered to 5 ft; easy augering Bulk sample S1 at 1-5 ft
405	5		Young Alluvial Deposits (Qya) Silty SAND (SM): fine to medium-grained sand, micaceous, non-plastic, strong brown (7.5YR-3/4), moist, very loose	BC=2 1 1	13"					100	29			MCAL sample 5 to 6.5 ft Augered to 10 ft	
400	10		Poorly graded SAND with Silt (SP-SM): fine to medium-grained sand, micaceous, non-plastic, light olive brown (2.5YR-5/3), moist, medium dense	BC=3 5 5	18"									MCAL sample 10 to 11.5 ft	
<p>The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on April 06, 2017.</p>															
<p>GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during drilling or after completion.</p> <p>GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.</p>															

 KLEINFELDER <i>Bright People. Right Solutions.</i>	PROJECT NO.: 20180057	BORING LOG PERC-1 Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	FIGURE
	DRAWN BY: JLB CHECKED BY: KC DATE: 4/13/2017 REVISED: -		A-5 PAGE: 1 of 1

Date Begin - End: 4/06/2017		Drilling Company: Pacific Drilling		BORING LOG PERC-2	
Logged By: J. Bonfiglio		Drill Crew: Carlos & Rory			
Hor.-Vert. Datum: Not Available - MSL		Drilling Equipment: Fraste Multidrill XL		Hammer Type - Drop: 140 lb. Auto - 30 in.	
Plunge: -90 degrees		Drilling Method: Hollow Stem Auger			
Weather: Sunny		Exploration Diameter: 8 in. O.D.			

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 411.00 Surface Condition: Bare Earth and Grass	Sample Type	Blow Counts (BC) = Uncorr. Blow/s in. Pocket Pen (PP) = tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks	
															Lithologic Description
-410			Artificial Fill (af) Sandy SILT (ML): fine to medium-grained sand, micaceous, low plasticity, very dark brown (7.5YR-2.5/2), moist												Augered to 5 ft; easy augering Bulk sample S1 at 1-5 ft
-405	5		Young Alluvial Deposits (Qya) Poorly graded SAND with Silt (SP-SM): fine to medium-grained sand, micaceous, non-plastic, light olive brown (2.5YR-5/3), moist, loose	BC=2 1 1	13"						100	5.6			MCAL sample 5 to 6.5 ft Augered to 10 ft
-400	10		Poorly graded SAND with Silt (SP-SM): fine to medium-grained sand, micaceous, non-plastic, light olive brown (2.5YR-5/3), moist, medium dense	BC=3 5 5	18"										MCAL sample 10 to 11.5 ft
<p>The boring was terminated at approximately 11.5 ft. below ground surface. The boring was backfilled with auger cuttings on April 06, 2017.</p> <p><u>GROUNDWATER LEVEL INFORMATION:</u> Groundwater was not observed during drilling or after completion.</p> <p><u>GENERAL NOTES:</u> The exploration location and elevation are approximate and were estimated by Kleinfelder.</p>															



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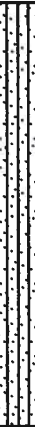
PROJECT NO.: 20180057	BORING LOG PERC-2	FIGURE A-6
DRAWN BY: JLB		
CHECKED BY: KC	Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	PAGE: 1 of 1
DATE: 4/13/2017		
REVISED: -		

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PLOTTED: 06/05/2017 10:00 AM BY: J.Bonfiglio

PROJECT NUMBER: 20180057.001A
 GINT FILE: Klf_gint_master_2017
 GINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2017.GLB [KLF_BORING/TEST PIT SOIL LOG]
 OFFICE FILTER: SAN DIEGO


Date Begin - End: 4/06/2017 Logged By: T. Meier Hor.-Vert. Datum: Not Available - MSL Plunge: N/A Weather: Sunny	Excavation Company: Cut N Core Excavation Crew: Excavation Equip.: CAT Backhoe Excav. Dimensions: 12 x 5 ft	TEST PIT LOG TP-2
---	--	--------------------------

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION		LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 412.00 Surface Condition: Bare Earth and Grass	Sample Type	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/Remarks	
			Lithologic Description										
			<u>Young Alluvial Deposits (Qva)</u> SILT with Sand (ML): fine to medium-grained sand, micaceous, non-plastic to low plasticity, light brown to brown, dry										
	410												
	5												
			<div>The test pit was terminated at approximately 5 ft. below ground surface. The test pit was backfilled with excavated material on April 06, 2017.</div> <div><u>GROUNDWATER LEVEL INFORMATION:</u> Groundwater was not observed during excavation or after completion. <u>GENERAL NOTES:</u> The exploration location and elevation are approximate and were estimated by Kleinfelder.</div>										
	405												
	10												
	400												

 KLEINFELDER <i>Bright People. Right Solutions.</i>	PROJECT NO.: 20180057 DRAWN BY: JLB CHECKED BY: KC DATE: 4/13/2017 REVISED: -	TEST PIT LOG TP-2 Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	FIGURE A-8

Date Begin - End: 4/06/2017		Drilling Company: Cut N Core	BORING LOG TP-3							
Logged By: T. Meier		Drill Crew:								
Hor.-Vert. Datum: Not Available - MSL		Drilling Equipment: CAT Backhoe								
Plunge: -90 degrees		Drilling Method:								
Weather: Sunny		Exploration Diameter: 11 x 5 in.								


Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 409.00 Surface Condition: Bare Earth and Grass	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PF)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks	
															Lithologic Description
			<u>Young Alluvial Deposits (Qya)</u> Sandy SILT (ML): fine to medium-grained sand, brown, dry	X											R-Value= 75
			Silty SAND (SM): fine to coarse-grained sand, olive brown to dark brown, moist	X											
-405				X											
5				X											
<p>The boring was terminated at approximately 5 ft. below ground surface. The boring was backfilled with excavated material on April 06, 2017.</p> <p>GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during drilling or after completion.</p> <p>GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.</p>															
-400															
10															
-395															

 KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 20180057	BORING LOG TP-3	FIGURE A-9
	DRAWN BY: JLB		
	CHECKED BY: KC	Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	
DATE: 4/13/2017		PAGE: 1 of 1	
REVISED: -			

PLOTTED: 06/05/2017 10:00 AM BY: JBonfiglio







Date Begin - End: 4/06/2017		Drilling Company: Cut N Core	BORING LOG TP-4							
Logged By: T. Meier		Drill Crew:								
Hor.-Vert. Datum: Not Available - MSL		Drilling Equipment: CAT Backhoe								
Plunge: -90 degrees		Drilling Method:								
Weather: Sunny		Exploration Diameter: 2 x 4 in.								

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION					LABORATORY RESULTS							
			Lithologic Description	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PF)= 1st	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks	
			Artificial Fill (af) Sandy SILT with Debris (ML): fine to coarse-grained sand, debris (plastic, metal tank), non-plastic, light brown, moist												Metal tank encountered at approximately 2 ft bgs
-405	5		The boring was terminated at approximately 2 ft. below ground surface. The boring was backfilled with excavated material on April 06, 2017.												
			GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during drilling or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.												
-400	10														
-395															

	PROJECT NO.: 20180057	BORING LOG TP-4	FIGURE
	DRAWN BY: JLB		
	CHECKED BY: KC	Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	A-10
	DATE: 4/13/2017		
	REVISED: -		PAGE: 1 of 1

PLOTTED: 06/05/2017 10:00 AM BY: JBornglio


Date Begin - End: 4/06/2017	Drilling Company: Cut N Core	BORING LOG TP-4A
Logged By: T. Meier	Drill Crew:	
Hor.-Vert. Datum: Not Available - MSL	Drilling Equipment: CAT Backhoe	
Plunge: -90 degrees	Drilling Method:	
Weather: Sunny	Exploration Diameter: 11 x 5 in.	

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS									
			Approximate Ground Surface Elevation (ft.): 409.00 Surface Condition: Bare Earth and Grass		Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks	
			Lithologic Description													
			Artificial Fill (af) Sandy SILT (ML): fine to coarse-grained sand, trace subangular to subrounded gravel, trace debris (plastic tubing, fencing), non-plastic to low plasticity, light brown, moist													
			Young Alluvial Deposits (Qya) Silty SAND (SM): fine to medium-grained sand, micaceous, non-plastic, brown, moist													
			-intermittent pockets of sandy silt at 3.5 to 4 ft													

The boring was terminated at approximately 5 ft. below ground surface. The boring was backfilled with excavated material on April 06, 2017.


GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.

GENERAL NOTES:
The exploration location and elevation are approximate and were estimated by Kleinfelder.

 KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 20180057	BORING LOG TP-4A	FIGURE A-11
	DRAWN BY: JLB		
	CHECKED BY: KC	Lakeside Equestrian Facility Willow Rd and Moreno Ave Lakeside, California	
	DATE: 4/13/2017		
	REVISED: -		PAGE: 1 of 1

Date Begin - End: 4/06/2017		Drilling Company: Cut N Core		BORING LOG TP-5	
Logged By: T. Meier		Drill Crew:			
Hor.-Vert. Datum: Not Available - MSL		Drilling Equipment: CAT Backhoe			
Plunge: -90 degrees		Drilling Method:			
Weather: Sunny		Exploration Diameter: 9 x 5 in.			

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 412.00 Surface Condition: Bare Earth and Grass	Sample Type	Blow Counts (BC)= Uncorr. Blow#6 in. Pocket Pen (PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks	
															Lithologic Description
			Young Alluvial Deposits (Qya) Sandy SILT (ML): fine to coarse-grained sand, non-plastic to low plasticity, olive brown, dry												
			Silty SAND (SM): fine to medium-grained sand, trace subangular gravel, micaceous, non-plastic, gray brown to dark brown, moist -medium-grained SAND lense at 4 ft												
			The boring was terminated at approximately 5 ft. below ground surface. The boring was backfilled with excavated material on April 06, 2017.												
			GROUNDWATER LEVEL INFORMATION: Groundwater was not observed during drilling or after completion. GENERAL NOTES: The exploration location and elevation are approximate and were estimated by Kleinfelder.												



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PROJECT NO.: 20180057

DRAWN BY: JLB

CHECKED BY: KC

DATE: 4/13/2017

REVISED: -

BORING LOG TP-5

Lakeside Equestrian Facility
Willow Rd and Moreno Ave
Lakeside, California

FIGURE

A-12

PAGE: 1 of 1

PLOTTED: 06/05/2017 10:00 AM BY: JBonfiglio

Date Begin - End: 4/06/2017 Drilling Company: Cut N Core
 Logged By: T. Meier Drill Crew:
 Hor.-Vert. Datum: Not Available - MSL Drilling Equipment: CAT Backhoe
 Plunge: -90 degrees Drilling Method:
 Weather: Sunny Exploration Diameter: 13 x 5 in.

BORING LOG TP-6

Approximate Elevation (feet)	Depth (feet)	Graphical Log	FIELD EXPLORATION				LABORATORY RESULTS								
			Approximate Ground Surface Elevation (ft.): 407.00 Surface Condition: Bare Earth and Grass		Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
			Lithologic Description												
		Artificial Fill (af) Sandy SILT (ML): fine to coarse-grained sand, micaceous, non-plastic to low plasticity, olive brown, moist													
		Silty SAND with Gravel (SM): fine to coarse-grained sand, subangular gravel, trace boulders, trace debris (concrete, asphalt, plastic), olive brown, moist													
	405														
	5		<p>The boring was terminated at approximately 5 ft. below ground surface. The boring was backfilled with excavated material on April 06, 2017.</p> <p><u>GROUNDWATER LEVEL INFORMATION:</u> Groundwater was not observed during drilling or after completion.</p> <p><u>GENERAL NOTES:</u> The exploration location and elevation are approximate and were estimated by Kleinfelder.</p>												
	400														
	10														
	395														



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PROJECT NO.: 20180057
 DRAWN BY: JLB
 CHECKED BY: KC
 DATE: 4/13/2017
 REVISED: -

BORING LOG TP-6

Lakeside Equestrian Facility
 Willow Rd and Moreno Ave
 Lakeside, California

FIGURE

A-13

APPENDIX B

LABORATORY TEST RESULTS

APPENDIX B LABORATORY TEST RESULTS

Laboratory tests were performed on selected bulk and drive samples from our borehole and test pit explorations to estimate engineering characteristics of the various earth materials encountered. Testing was performed in accordance with ASTM Standards for Soil Testing and are presented in herein.

CLASSIFICATION

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D2488. Soil classifications are indicated on the logs of the exploratory borings in Appendix A.

MOISTURE CONTENT AND DRY UNIT WEIGHT

Natural moisture content and dry unit weight tests were performed on selected drive samples collected from the boreholes in accordance with ASTM D2216 and D2937, respectively. The results are presented on the boring and test pit logs in Appendix A as Figures A-3 through A-13.

GRADATION ANALYSES

Five sieve analyses were performed on representative samples of the materials encountered at the site to evaluate the gradation characteristics of the soil and to aid in classification. The tests were performed in general accordance with ASTM Test Method D422. The results of the sieve analyses are presented on the boring and test pit logs in Appendix A as Figures A-3 through A-13 and in Appendix B on Figures B-1 through B-5.

ATTERBERG LIMITS

An Atterberg limits test was performed on a selected near-surface soil sample from boring B-1 to evaluate the plasticity characteristics (liquid limit, plastic limit, and plasticity index) of the soil and to aid in its classification. The test was performed in general accordance with ASTM Test Method D4318. The Atterberg limits test result is presented on the log for boring B-1 on Figure A-3 and in Appendix B on Figure B-6.

DIRECT SHEAR TEST

Two direct shear strength tests were performed on representative soil samples. One test was performed on a remolded sample and one test was performed on a drive sample. The test procedures were performed in general accordance with ASTM Test Method D3080. The test results are presented on Figures B-7 and B-8.

EXPANSION INDEX

An expansion index tests was performed on a representative soil sample of the alluvial deposits from boring B-2. The test procedures were performed in general accordance with ASTM Test Method D4829. The corrected expansion index of 5, presented on Figure B-9, may be compared to Table B-1 presented below to qualitatively evaluate the expansion potential of the near-surface site soils.

Table B-1
Expansion Index and Potential

Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

R-VALUE

An R-Value tests was performed on a representative soil sample to evaluate resistance value of the near surface soils. The tests were performed using modified effort in general accordance with ASTM Test Method D2844. The R-value test result in presented on Figure B-10.

MODIFIED PROCTOR

A modified proctor test was performed on a representative soil sample of the near surface soils to evaluate compaction characteristics. The test was performed in accordance with ASTM D1557 and the test result is given in Table B-2 and is included in Appendix B.

Table B-2
Modified Proctor Test Results

Sample	Depth (ft)	Maximum Dry Unit Weight (pcf)	Optimum Water Content (%)
B2-S1	1-5	122.9	11.8

CORROSION TESTS

A series of chemical tests were performed on a representative sample of the near surface soils to estimate pH, resistivity, and sulfate and chloride contents. The test procedures were in general accordance with the California Tests 417, 422, and 643. The test results are presented in Table B-2 and are included in Appendix B.

Table B-3
Corrosion Test Results

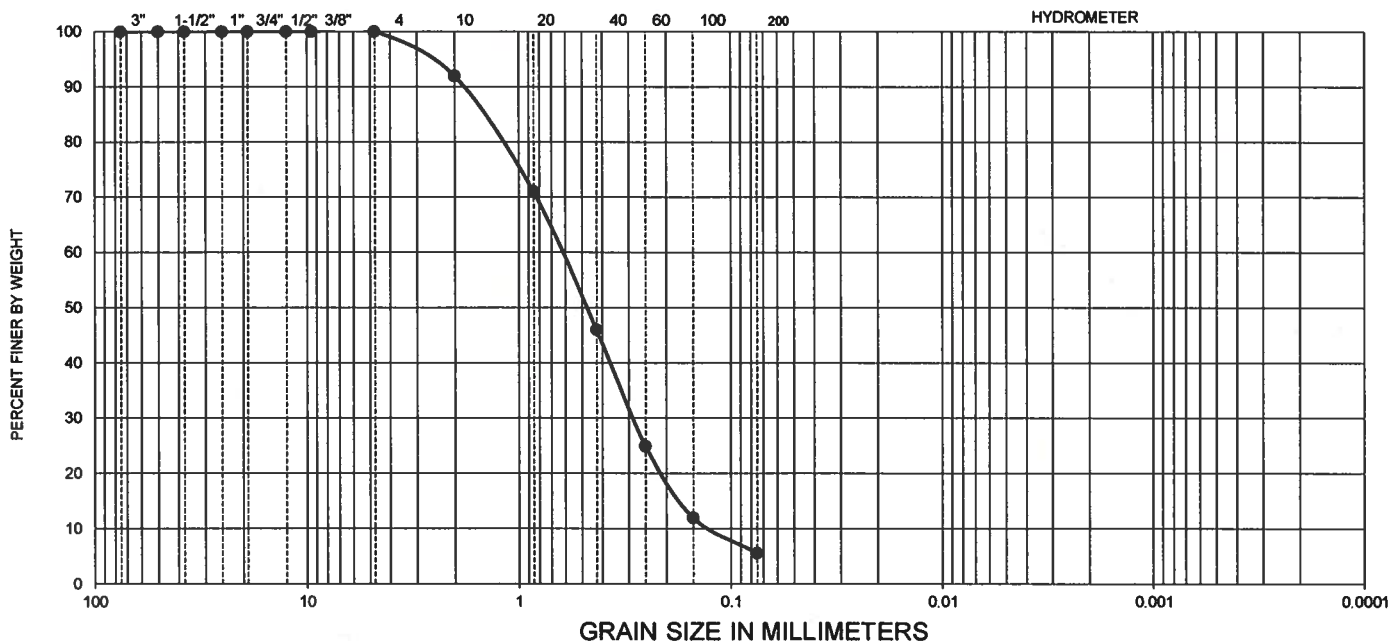
Sample	Depth (ft)	pH	Sulfate (% by Wt)	Chloride (% by Wt)	Minimum Resistivity (ohm-cm)
B2-S1	1-5	8.7	0.011	0.004	1,900

Date Tested: 4/19/2017

USCS

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

U.S. STANDARD SIEVE NUMBERS



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
B1	S1	1-5	5.6	SP-SM

Sample Description	Brown Poorly graded sand with silt
--------------------	------------------------------------

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	92
	No. 20	0.85 mm	71
	No. 40	0.425 mm	46
	No. 60	0.25 mm	25
	No 100	0.15 mm	12
	No 200	.075 mm	5.6

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913



GRADATION TEST RESULTS

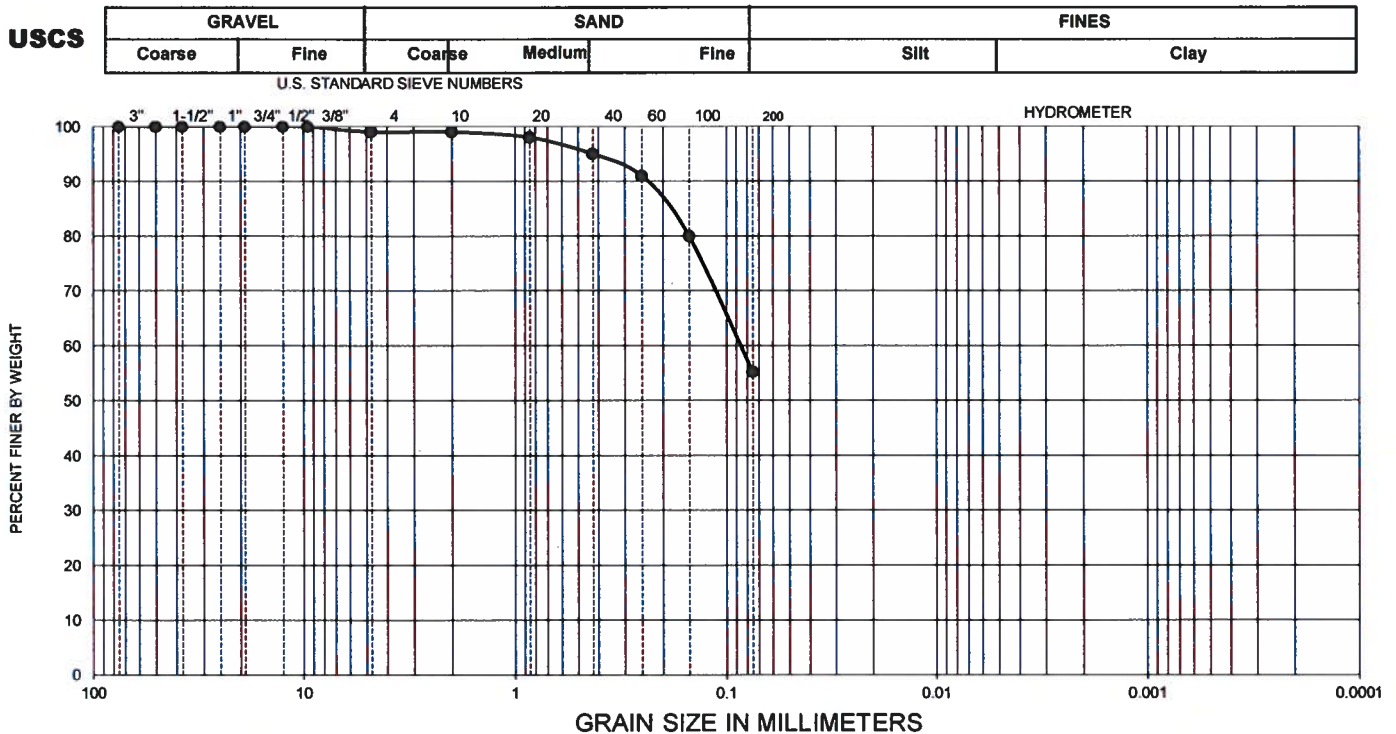
Lakeside Equestrian Facility
Lakeside, CA

FIGURE

B-1

Checked by:	JLB	Tech:	Uly P.
Project No.	20180057.001A	Date:	5-Jun-17

Date Tested: 4/19/2017



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
B1	S3	11-11.5	55.2	ML

Sample Description	Dark brown Sandy silt
--------------------	-----------------------

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	99
	No. 10	2.0 mm	99
	No. 20	0.85 mm	98
	No. 40	0.425 mm	95
	No. 60	0.25 mm	91
	No 100	0.15 mm	80
	No 200	.075 mm	55.2

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913



GRADATION TEST RESULTS

Lakeside Equestrian Facility
Lakeside, CA

FIGURE

B-2

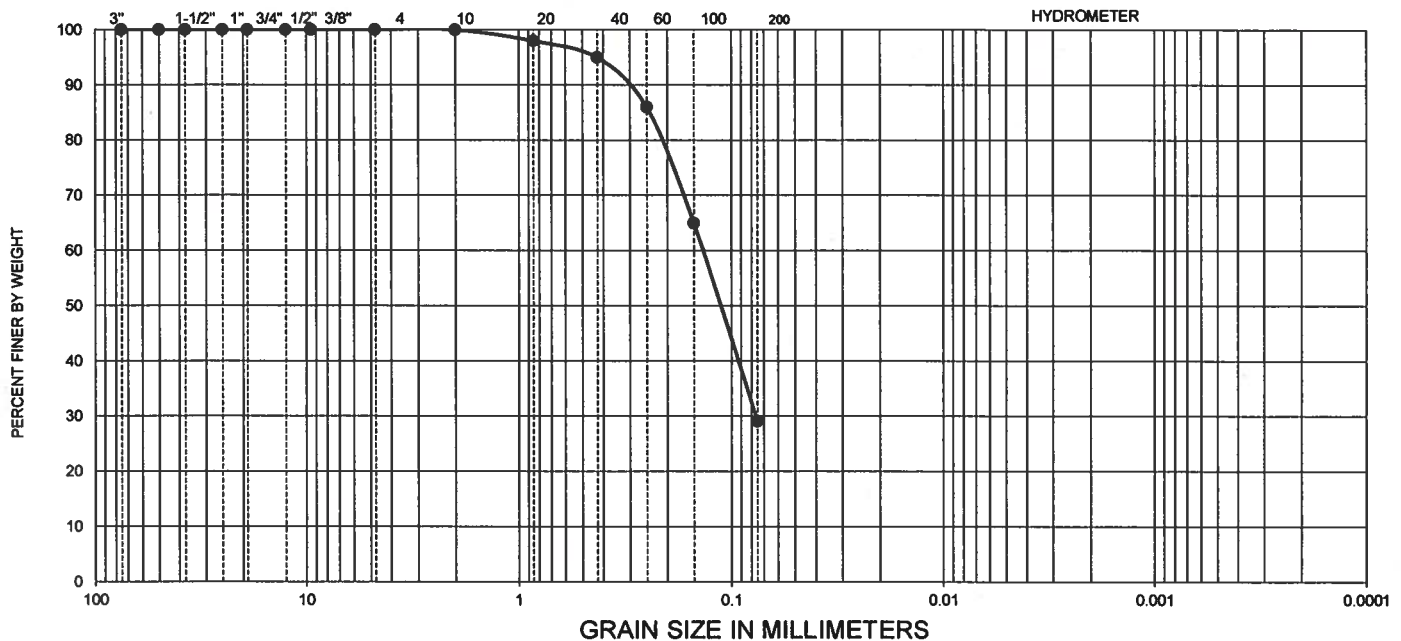
Checked by:	JLB	Tech:	Uly P.
Project No.	20180057.001A	Date:	5-Jun-17

Date Tested: 4/19/2017

USCS

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

U.S. STANDARD SIEVE NUMBERS



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
Perc-1	S2	6-6.5	29.1	SM

Sample Description	Brown Silty sand
--------------------	------------------

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	100
	No. 20	0.85 mm	98
	No. 40	0.425 mm	95
	No. 60	0.25 mm	86
	No 100	0.15 mm	65
	No 200	.075 mm	29.1

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913



GRADATION TEST RESULTS

Lakeside Equestrian Facility
Lakeside, CA

FIGURE

B-3

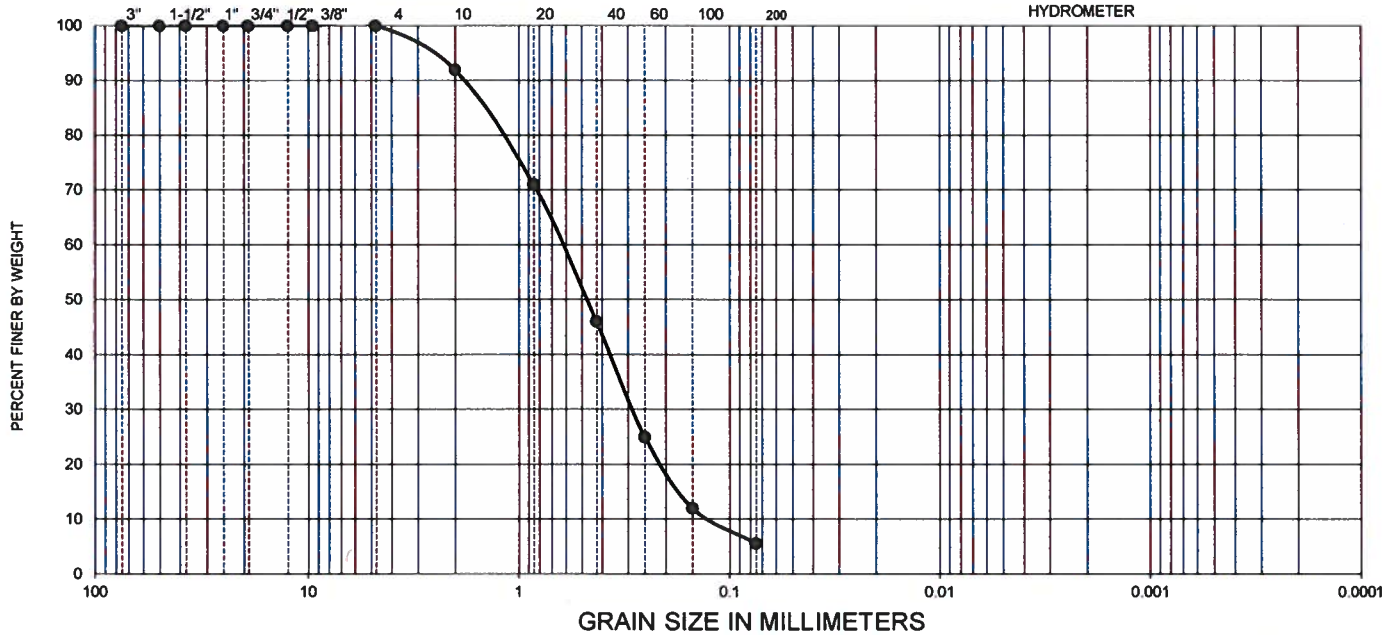
Checked by:	JLB	Tech:	Uly P.
Project No.	20180057.001A	Date:	5-Jun-17

Date Tested: 4/19/2017

USCS

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

U.S. STANDARD SIEVE NUMBERS



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
Perc-2	S2	6-6.5	5.6	SP-SM

Sample Description
Brown Poorly graded sand with silt

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	92
	No. 20	0.85 mm	71
	No. 40	0.425 mm	46
	No. 60	0.25 mm	25
	No. 100	0.15 mm	12
	No. 200	.075 mm	5.6

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913



GRADATION TEST RESULTS

Lakeside Equestrian Facility
Lakeside, CA

FIGURE

B-4

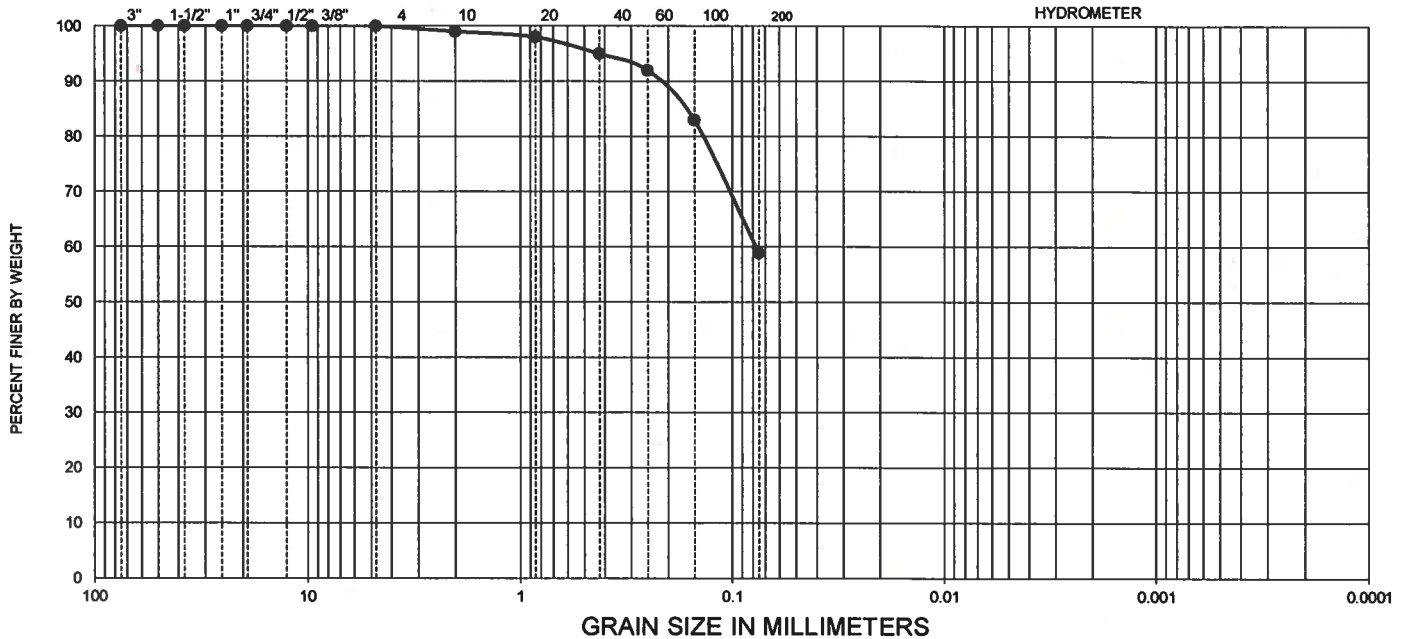
Checked by:	JLB	Tech:	Uly P.
Project No.	20180057.001A	Date:	5-Jun-17

Date Tested: 4/19/2017

USCS

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

U.S. STANDARD SIEVE NUMBERS



Boring No.	Sample No.	Depth (ft)	Passing 200 (%)	USCS Classification
TP1	S1	1-5	58.9	ML

Sample Description	Brown Sandy silt
--------------------	------------------

Sieve Analysis	Sieve Size		% Passing
	3"	75 mm	100
	2"	50 mm	100
	1.5"	37.5 mm	100
	1"	25 mm	100
	3/4"	19 mm	100
	1/2"	12.5 mm	100
	3/8"	9.5 mm	100
	No. 4	4.75 mm	100
	No. 10	2.0 mm	99
	No. 20	0.85 mm	98
	No. 40	0.425 mm	95
	No. 60	0.25 mm	92
	No 100	0.15 mm	83
	No 200	.075 mm	58.9

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 6913



GRADATION TEST RESULTS

Lakeside Equestrian Facility
Lakeside, CA

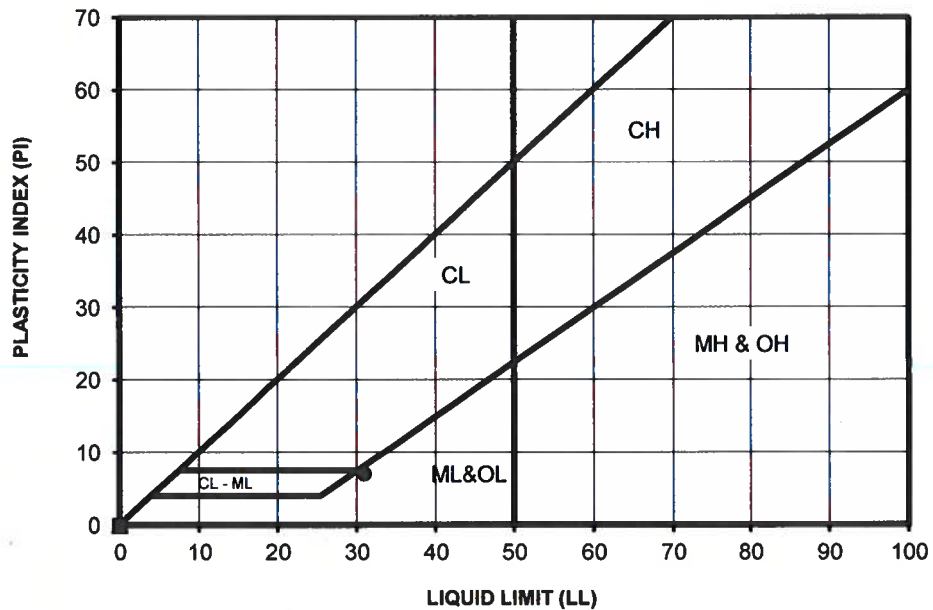
FIGURE

B-5

Checked by:	JLB	Tech:	Uly P.
Project No.	20180057.001A	Date:	5-Jun-17

Date Tested : 4/19/2017

SYMBOL	SAMPLE NAME	DEPTH (ft)	LL	PL	PI	USCS CLASSIFICATION (Minus No. 40 Sieve Fraction)	USCS (Entire Sample)
●	B1-S1	1'-5'	31	24	7	ML	ML
■							
◆							
○							
□							
△							
+							
◇							



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.



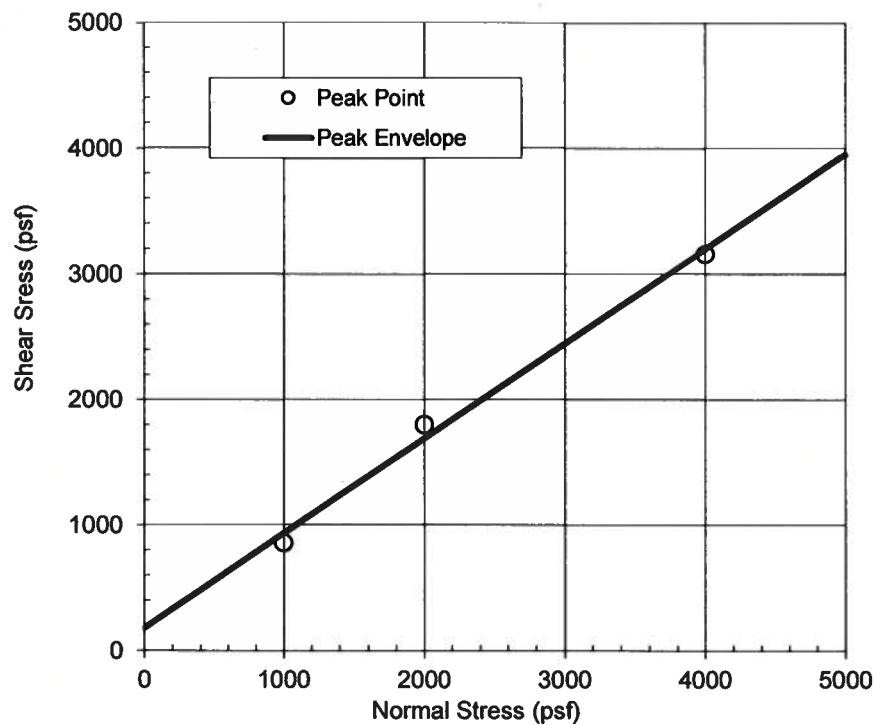
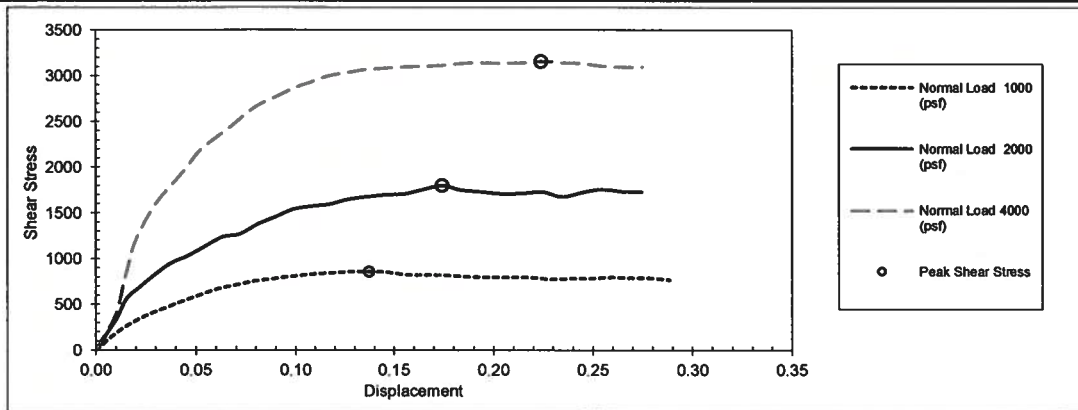
ATTERBERG LIMITS TEST RESULTS

FIGURE

Lakeside Equestrian Facility
Lakeside, CA

B-6

Check by JLB Tested by Uly P.
PROJECT NO: 20180057.001A 5-Jun-17



Strain Rate = 0.0118 inch/min
Date Tested: 4/17/2017

				Interpreted Shear Strength			
				Peak			
Boring No.	Sample No.	Depth	UCSC	Cohesion (psf)	Friction Angle (deg)		
B1	S2	6'-6.5'	SM	179	37.0		

Sample description: Brown silty fine sand



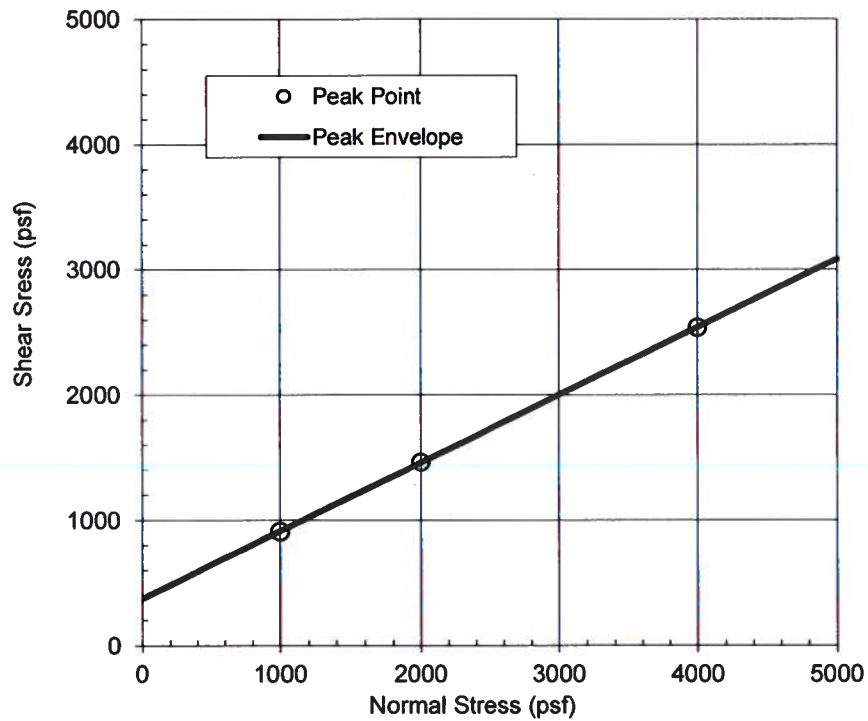
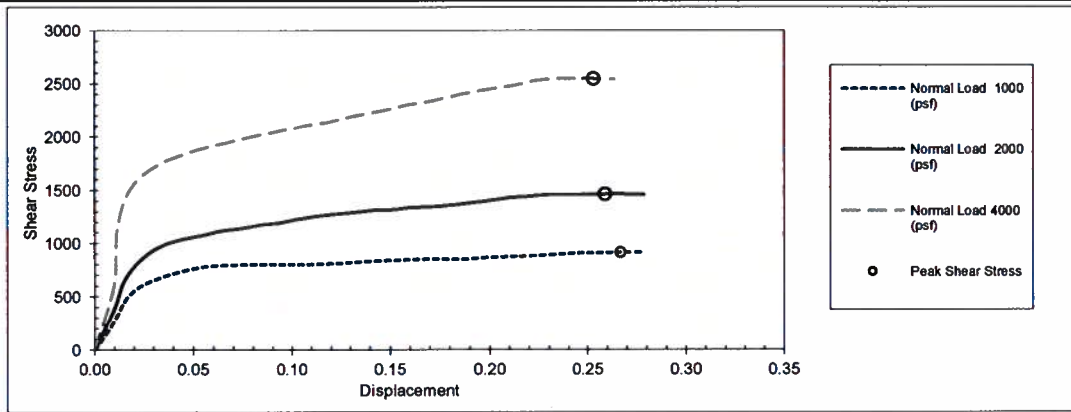
Checked By: JLB Tech: Uly P.
Project # 20180057.001A 5-Jun-17

Direct Shear Test Results (ASTM D 3080)

Lakeside Equestrian Facility
Lakeside, CA

Figure

B-7



Strain Rate = 0.00945 inch/min
Date Tested: 4/20/2017

				Interpreted Shear Strength			
				Peak			
Boring No.	Sample No.	Depth	UCSC	Cohesion (psf)	Friction Angle (deg)		
B2	S1	1'-5'	CL	373	28.5		

Sample description: brown sandy clay



Checked By: JLB Tech: Uly P.
Project #: 20180057.001A 5-Jun-17

Remolded Direct Shear Test Results (ASTM D 3080)

Lakeside Equestrian Facility
Lakeside, CA

Figure

B-8

Boring No.	Sample No.	Depth (ft)	Sample Description
B2	S2B	6'-6.5'	Brown sandy silt

Density Determination		Trial #1	Trial #2
Weight Compacted Sample and Ring		759.3	
Weight of Ring		362.7	
Net Weight of Sample		396.6	
Wet Density, pcf		120.2	
Dry Density, pcf		109.5	

Moisture Determination			
Wet Weight of Sample, g		88.32	
Dry Weight of Sample, g		80.42	
Moisture Content, %		9.8%	

Expansion Index		5	
Corrected Expansion Index		5	(VERY LOW)
% Saturation		49.1	

Expansion Readings		
DATE	TIME	READING
4/19/2017	10:10am	0.2927
4/19/2017	10:20am	0.2921 << Add Water
4/20/2017	10:10am	0.2971 << Final

Moisture Content after Test	
Wet+Ring	786.7
Dry	361.1
	17.4%




CHECKED BY: JLB TECH: Uly P.
 JOB NUMBER 20180057.001A DATE: 6/5/2017

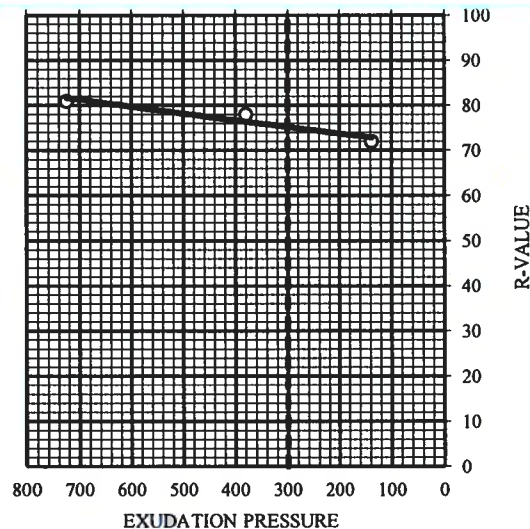
Expansion Index (ASTM D4829)

**Lakeside Equestrian Facility
 Lakeside, CA**

FIGURE

B-9

Boring No.	Sample No.	Depth	Description	Date Tested
TP-3	S1	1'-5'	Dark yellowish brown silty sand	4/18/2017
TEST SPECIMEN				
MOLD NO.	8	5	9	
FOOT PRESSURE, psi	350	350	330	
INITIAL MOISTURE, %	5.5	5.5	5.5	
"AS-IS" WEIGHT, g	1200	1200	1200	
DRY WEIGHT, g	1137.8	1137.8	1137.8	
WATER ADDED, ml	40.5	50	60	
COMPACTION MOISTURE, %	9.0	9.9	10.7	
HEIGHT OF BRIQUETTE, in.	2.45	2.5	2.49	
WEIGHT BRIQUETTE/MOLD, g	3223.4	3219.9	3224.9	
WEIGHT OF MOLD, g	2112.4	2107.6	2114.3	
WEIGHT OF BRIQUETTE, g	1111	1112.3	1110.6	
DRY DENSITY, pcf	126.2	122.8	122.2	
STABILOMETER, 1000 lbs	11	12	14	
2000lbs	18	20	26	
DISPLACEMENT, in	4.71	5.04	4.9	
EXUDATION LOAD, lbs	9102	4771	1727	
EXUDATION PRESSURE, psi	724.7	379.9	137.5	
R-VALUE	81	78	72	
CORRECTED R-VALUE	81	78	72	
DIAL READING, END	0.0210	0.0296	0.0298	
DIAL READING, START	0.0205	0.0300	0.0300	
DIFFERENCE	0.0005	-0.0004	-0.0002	
EXPANSION PRESSURE, PSF	21.8	0.0	0.0	
INITIAL MOISTURE				
WET WEIGHT, g	542.5			
DRY WEIGHT, g	514.4			
WEIGHT OF WATER				
WEIGHT OF SAMPLE				
MOISTURE CONTENT %	5.5			
R-VALUE:	75			
Location:				
<p>Limitations: Pursuant to applicable codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specification were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.</p>				
		R-Value (ASTM D2844) Lakeside Equestrian Facility Lakeside, CA		FIGURE B-10
Tested By: Uly P.		DATE: 5-Jun-17		
Job Number: 20180057.001A				





Laboratory Test Report

Client: County of San Diego, CA

Report No.: 17-SAN-00179 Rev. 0

Issued:

Project: 20180057.001A

T-County of San Diego, CA: Lakeside Eque

Sampled by: Janna Bonfiglio

Date: 4/6/2017

05-000L - Geotechnical Lab Testing

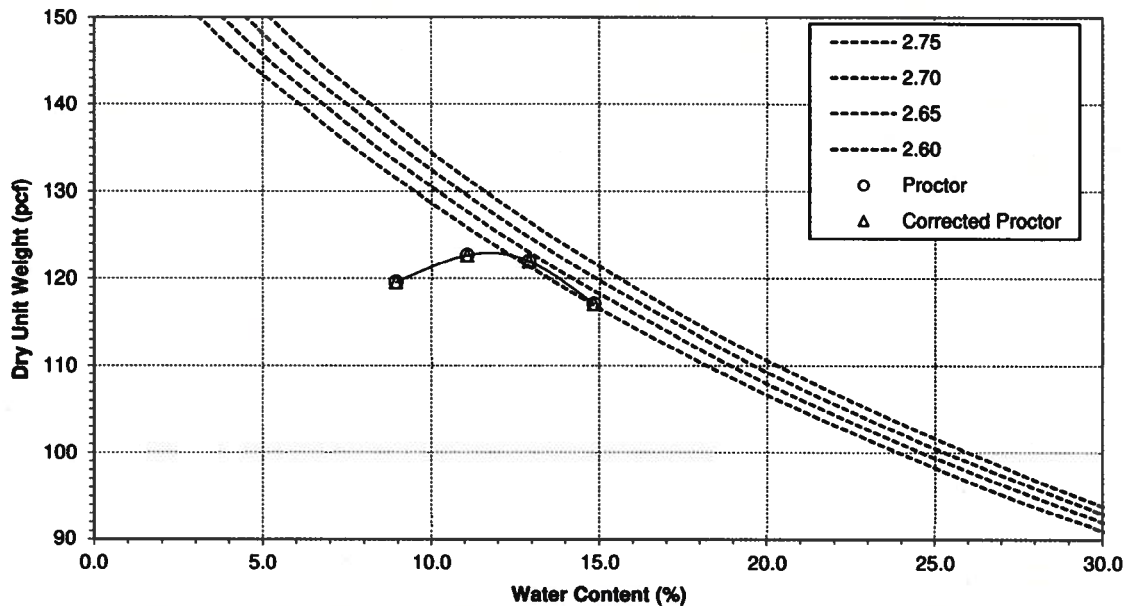
Submitted by: Janna Bonfiglio

Date: 4/12/2017

Tested on 4/17/2017 by U. Panuncialman

Material Description: brown sandy clay

Location: B2 / S1 at 1'-5'



Test Method: ASTM D1557 A	Uncorrected	Corrected
Maximum Dry Unit Weight (pcf)	122.9	na
Optimum Water Content (%)	11.8	na
Oversize Fraction, retained on (%)		<5
Bulk Specific Gravity of Oversize Fraction		na

Rammer Type: Mechanical

Specimen Preparation: Moist

Reviewed on by Ulysses Panuncialman,
Lab Supervisor

Limitations: Pursuant to applicable building codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specifications were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

L A B O R A T O R Y R E P O R T

Telephone (619) 425-1993 Fax 425-7917 Established 1928

C L A R K S O N L A B O R A T O R Y A N D S U P P L Y I N C.
350 Trousdale Dr. Chula Vista, Ca. 91910 www.clarksonlab.com
A N A L Y T I C A L A N D C O N S U L T I N G C H E M I S T S

Date: April 19, 2017
Purchase Order Number: 20180057.001A
Sales Order Number: 35441
Account Number: KLE

To:

Kleinfelder Inc.
550 West C Street Ste 1200
San Diego, CA 92101
Attention: Uly Panuncialman

Laboratory Number: SO6368 Customers Phone: 831-4600
Fax: 831-4619

Sample Designation:

One soil sample received on 04/17/17 at 9:00am
marked as:

Project: Lakeside Equestrian Park
Project #: 20180057.001A
Boring #: B2
Sample #: S1
Depth: 1'-5'
Sampled by Janna Bonfiglio
Date Sampled 04/06/2017

Analysis By California Test 643, 1999, Department of Transportation
Division of Construction, Method for Estimating the Service Life of
Steel Culverts.

pH 8.7

Water Added (ml)	Resistivity (ohm-cm)
10	9200
5	5700
5	3000
5	2200
5	2000
5	1900
5	2100
5	2300

40 years to perforation for a 16 gauge metal culvert.
52 years to perforation for a 14 gauge metal culvert.
72 years to perforation for a 12 gauge metal culvert.
91 years to perforation for a 10 gauge metal culvert.
111 years to perforation for a 8 gauge metal culvert.

Water Soluble Sulfate Calif. Test 417 0.011% (110ppm)
Water Soluble Chloride Calif. Test 422 0.004% (43ppm)



Laura Torres
LT/ram

APPENDIX C

INFILTRATION FEASIBILITY STUDY

Categorization of Infiltration Feasibility Condition		Form I-8	
<p>Part 1 - Full Infiltration Feasibility Screening Criteria</p> <p>Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?</p> <p>Note that it is not necessary to investigate each and every criterion in the worksheet if infiltration is precluded. Instead a letter of justification from a geotechnical professional familiar with the local conditions substantiating any geotechnical issues will be required.</p>			
Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X
<p>Provide basis:</p> <p>The geotechnical study performed at the site included percolation testing. The percolation test PERC-1 indicated a raw (unfactored) infiltration rate of 0.31 inches per hour. Our review of Natural Resources Conservation Service (NRCS) Soil Survey Maps (a.k.a. USDA Soil Maps) indicate the site soils consist of Visalia sandy loam. This material is designated as being of the Hydrologic Soils Group "A" which is defined as a well drained material (very low runoff potential). The factored infiltration rate is 0.12 inches per hour assuming a Safety Factor of 2.6.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
2	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	
<p>Provide basis:</p> <p>Infiltration greater than 0.5 inches could be allowed. However, as discussed in Criteria 1 above, site-specific test results for the project indicate a raw infiltration rate of 0.31 inches per hour. Therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. The loose to medium dense soils are potentially liquefiable if saturated, therefore an appreciable amount of infiltration may increase the risk of liquefaction and magnitude of settlement. However, the location of the proposed basin with respect to the proposed structures does not present a significant liquefaction risk.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			

Form I-8 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
<p>Provide basis: Infiltration greater than 0.5 inches could be allowed. However, as discussed in Criteria 1 above, site specific test results for the project indicate an unfactored infiltration rate of 0.31 inches per hour. Therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. However, the depth to the local groundwater table at the site is estimated to be greater than 20 feet below existing site grade based on borings performed at the site. In this respect, the potential for contamination of the local groundwater is considered low. This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
4	Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
<p>Provide basis: As discussed in Criteria 1 above, site specific test results for the project indicate an unfactored infiltration rate of 0.31 inches per hour; therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. However, it may be assumed that there is a very low probability of causing a potential water balance issue that would change seasonally ephemeral streams or increased discharge of contaminated groundwater to surface waters.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
Part 1 Result *	<p>If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration</p> <p>If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2</p>		NO

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Form I-8 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	

Provide basis:

The site conditions have been characterized as noted in Criteria 1 to have an unfactored infiltration rate of 0.31 inches per hour and a factored infiltration rate of 0.12 inches/hour. This does not appear to be an "appreciable rate" but it is considered partial infiltration at a rate much lower than 0.5 inches per hour.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

6	Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	
---	--	---	--

Provide basis:

As discussed previously, an infiltration rate well below 0.5 inch/hour is feasible at the site. Due to the soil conditions at the site, infiltration in any appreciable amount may increase the risk of liquefaction occurring. However, based on the location of the proposed basin to the proposed structures and the low infiltration rate, there is not a significant liquefaction risk to the proposed development.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.

Form I-8 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
<p>Provide basis:</p> <p>As stated previously, the depth to the local groundwater table at the site is greater than 20 feet below existing site grade. In this respect, the potential risks to the local groundwater is considered low. As discussed, an infiltration rate well below 0.5 inches per hour is feasible at the site.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
<p>Provide basis:</p> <p>It does not appear that stormwater infiltration would cause a violation of downstream water rights.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration . If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration .		Partial Infiltration

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Factor of Safety and Design Infiltration Rate Worksheet				Form I-9	
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) $p = w \times v$
A	Suitability Assessment	Soil assessment methods	0.25	2	0.5
		Predominant soil texture	0.25	2	0.5
		Site soil variability	0.25	2	0.5
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$				1.75
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	2	0.5
		Compaction during construction	0.25	2	0.5
		Design Safety Factor, $S_B = \Sigma p$				1.5
Combined Safety Factor, $S_{total} = S_A \times S_B$				2.6	
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)				0.31	
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$				0.12	
Supporting Data					
<p>Briefly describe infiltration test and provide reference to test forms:</p> <p>Percolation test was performed at the site location at a depth of 5 feet bgs.</p>					

Categorization of Infiltration Feasibility Condition		Form I-8	
<p>Part 1 - Full Infiltration Feasibility Screening Criteria</p> <p>Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?</p> <p>Note that it is not necessary to investigate each and every criterion in the worksheet if infiltration is precluded. Instead a letter of justification from a geotechnical professional familiar with the local conditions substantiating any geotechnical issues will be required.</p>			
Criteria	Screening Question	Yes	No
1	<p>Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.</p>		X
<p>Provide basis:</p> <p>The geotechnical study performed at the site included percolation testing. The percolation test PERC-1 indicated a raw (unfactored) infiltration rate of 0.11 inches per hour. Our review of Natural Resources Conservation Service (NRCS) Soil Survey Maps (a.k.a. USDA Soil Maps) indicate the site soils consist of Visalia sandy loam. This material is designated as being of the Hydrologic Soils Group "A" which is defined as a well drained material (very low runoff potential). The factored infiltration rate is 0.04 inches per hour assuming a Safety Factor of 2.6.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
2	<p>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.</p>	X	
<p>Provide basis:</p> <p>Infiltration greater than 0.5 inches could be allowed. However, as discussed in Criteria 1 above, site specific test results for the project indicate a raw infiltration rate of 0.11 inches per hour; therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. Additionally, the site is potentially liquefiable and therefore any infiltration in any appreciable amount may increase the risk of liquefaction occurring at the site. However, the location of the proposed basin with respect to the proposed structures does not present a significant liquefaction risk.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			

Form I-8 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	<p>Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis: Infiltration greater than 0.5 inches could be allowed. However, as discussed in Criteria 1 above, site specific test results for the project indicate an unfactored infiltration rate of 0.11 inches per hour. Therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. However, the depth to the local groundwater table at the site is estimated to be greater than 20 feet below existing site grade based on borings performed at the site. In this respect, the potential for contamination of the local groundwater is considered low. This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
4	<p>Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.</p>	X	
<p>Provide basis: As discussed in Criteria 1 above, site specific test results for the project indicate an unfactored infiltration rate of 0.11 inches per hour; therefore, an infiltration rate greater than 0.5 inches per hour is not feasible. However, it may be assumed that there is a very low probability of causing a potential water balance issue that would change seasonally ephemeral streams or increased discharge of contaminated groundwater to surface waters.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
Part 1 Result *	<p>If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration</p> <p>If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2</p>		No

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Form I-8 Page 3 of 4

Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria

Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?

Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	
<p>Provide basis:</p> <p>The site conditions have been characterized as noted in Criteria 1 to have an unfactored infiltration rate of 0.11 inches per hour and a factored infiltration rate of 0.04 inches per hour. This does not appear to be an "appreciable rate" but it is considered partial infiltration at a rate much lower than 0.5 inches per hour.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			
6	Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	
<p>Provide basis:</p> <p>As discussed previously, infiltration is feasible at the site at a rate well below 0.5 inch/hour is. Additionally, due to the soil conditions at the site, infiltration in any appreciable amount may increase the risk of liquefaction occurring at the site. However, based on the location of the proposed basin to the proposed structures, there is not a significant liquefaction risk to the proposed development.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			

Form I-8 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
<p>Provide basis:</p> <p>As stated previously, the depth to the local groundwater table at the site is greater than 20 feet below existing site grade. In this respect, the potential risks to the local groundwater is considered low. As discussed, an infiltration rate well below 0.5 inches per hour is feasible at the site.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question must be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
<p>Provide basis:</p> <p>It does not appear that stormwater infiltration would cause a violation of downstream water rights.</p> <p>This is not a geotechnical criterion and should be completed by the Storm Water Quality Management Plan (SWQMP) preparer or other qualified professional.</p> <p>Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.</p>			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration . If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration .		Partial Infiltration

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by Agency/Jurisdictions to substantiate findings

Factor of Safety and Design Infiltration Rate Worksheet				Form I-9	
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) $p = w \times v$
A	Suitability Assessment	Soil assessment methods	0.25	2	0.5
		Predominant soil texture	0.25	2	0.5
		Site soil variability	0.25	2	0.5
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$				1.75
B	Design	Level of pretreatment/ expected sediment loads	0.5	1	0.5
		Redundancy/resiliency	0.25	2	0.5
		Compaction during construction	0.25	2	0.5
		Design Safety Factor, $S_B = \Sigma p$				1.5
Combined Safety Factor, $S_{total} = S_A \times S_B$				2.6	
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)				0.11	
Design Infiltration Rate, in/hr, $K_{design} = K_{observed} / S_{total}$				0.04	
Supporting Data					
<p>Briefly describe infiltration test and provide reference to test forms:</p> <p>Percolation test was performed at the site location at a depth of 5 feet bgs.</p>					



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
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agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for San Diego County Area, California



April 12, 2017

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

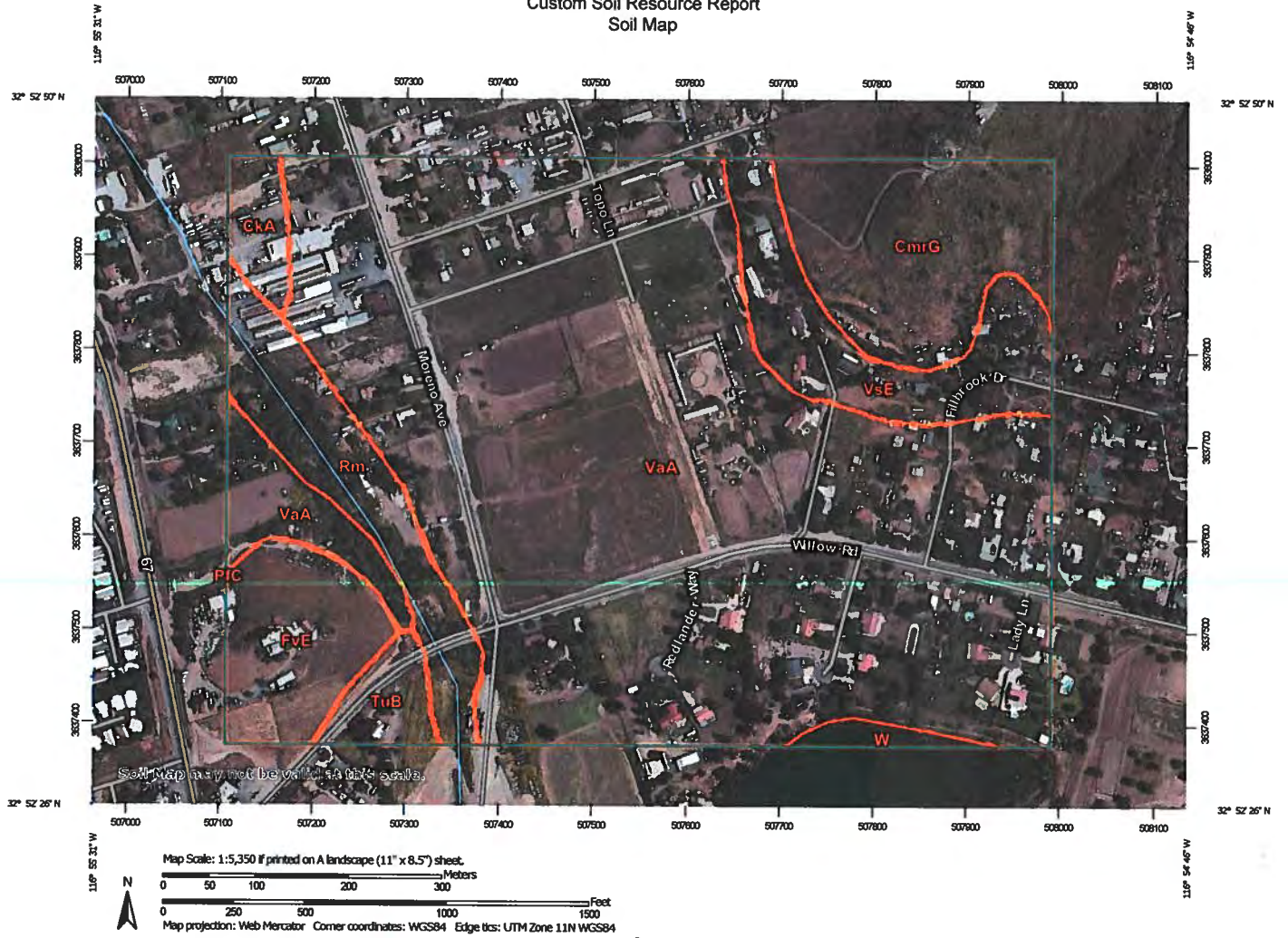
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map








































The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



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MAP LEGEND

	Area of Interest (AOI)		Spoil Area
	Soil Map Unit Polygons		Stony Spot
	Soil Map Unit Lines		Very Stony Spot
	Soil Map Unit Points		Wet Spot
	Special Point Features		Other
	Blowout		Special Line Features
	Borrow Pit		Water Features
	Clay Spot		Streams and Canals
	Closed Depression		Transportation
	Gravel Pit		Rails
	Gravelly Spot		Interstate Highways
	Landfill		US Routes
	Lava Flow		Major Roads
	Marsh or swamp		Local Roads
	Mine or Quarry		Background
	Miscellaneous Water		Aerial Photography
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Diego County Area, California
Survey Area Data: Version 10, Sep 12, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

San Diego County Area, California (CA638)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CkA	Chino silt loam, saline, 0 to 2 percent slopes	2.3	1.6%
CmrG	Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes	12.7	9.2%
FvE	Fallbrook-Vista sandy loams, 15 to 30 percent slopes	7.5	5.4%
PfC	Placentia sandy loam, thick surface, 2 to 9 percent slopes	0.0	0.0%
Rm	Riverwash	8.9	6.4%
TuB	Tujunga sand, 0 to 5 percent slopes	2.5	1.8%
VaA	Visalia sandy loam, 0 to 2 percent slopes	94.0	68.0%
VsE	Vista coarse sandy loam, 15 to 30 percent slopes	9.4	6.8%
W	Water	1.0	0.7%
Totals for Area of Interest		138.2	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They

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generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Diego County Area, California

CkA—Chino silt loam, saline, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hb9p

Elevation: 20 to 3,100 feet

Mean annual precipitation: 8 to 20 inches

Mean annual air temperature: 61 to 64 degrees F

Frost-free period: 230 to 340 days

Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Chino and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chino

Setting

Landform: Alluvial fans

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope, rise

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 20 inches: silt loam

H2 - 20 to 33 inches: silt loam

H3 - 33 to 60 inches: loam, silt loam

H3 - 33 to 60 inches:

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 5.0

Available water storage in profile: Very high (about 13.8 inches)

Interpretive groups

Land capability classification (irrigated): 2s

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: C

Hydric soil rating: No

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Minor Components

Grangeville

Percent of map unit: 5 percent

Hydric soil rating: No

Placentia

Percent of map unit: 5 percent

Hydric soil rating: No

Visalia

Percent of map unit: 4 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

Landform: Alluvial fans

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope, rise

Down-slope shape: Linear

Across-slope shape: Convex

Hydric soil rating: Yes

CmrG—Cieneba very rocky coarse sandy loam, 30 to 75 percent slopes

Map Unit Setting

National map unit symbol: hb9v

Elevation: 500 to 4,000 feet

Mean annual precipitation: 8 to 35 inches

Mean annual air temperature: 45 to 64 degrees F

Frost-free period: 110 to 300 days

Farmland classification: Not prime farmland

Map Unit Composition

Cieneba and similar soils: 45 percent

Rock outcrop: 45 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cieneba

Setting

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from granite and granodiorite

Typical profile

H1 - 0 to 8 inches: coarse sandy loam

Custom Soil Resource Report

H2 - 8 to 12 inches: weathered bedrock

Properties and qualities

Slope: 30 to 75 percent

Depth to restrictive feature: 4 to 20 inches to paralithic bedrock

Natural drainage class: Somewhat excessively drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: D

Ecological site: SHALLOW LOAMY (1975) (R019XD060CA)

Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Typical profile

H1 - 0 to 4 inches: unweathered bedrock

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Hydric soil rating: No

Minor Components

Vista

Percent of map unit: 5 percent

Hydric soil rating: No

Las posas

Percent of map unit: 5 percent

Hydric soil rating: No

Custom Soil Resource Report

FvE—Fallbrook-Vista sandy loams, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hbc2
Elevation: 200 to 3,900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 210 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Fallbrook and similar soils: 50 percent
Vista and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fallbrook

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 12 inches: loam, sandy loam
H2 - 6 to 12 inches: sandy clay loam, clay loam
H3 - 12 to 28 inches: loam, sandy loam
H3 - 12 to 28 inches: weathered bedrock
H4 - 28 to 47 inches:
H4 - 28 to 47 inches:
H5 - 47 to 51 inches:

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very high (about 13.2 inches)

Custom Soil Resource Report

Interpretive groups

Land capability classification (irrigated): 6e

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Hydric soil rating: No

Description of Vista

Setting

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Grus derived from quartz-diorite and/or grus derived from granodiorite

Typical profile

H1 - 0 to 19 inches: sandy loam

H2 - 19 to 35 inches: coarse sandy loam, sandy loam

H2 - 19 to 35 inches: weathered bedrock

H3 - 35 to 39 inches:

Properties and qualities

Slope: 15 to 30 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Hydric soil rating: No

Minor Components

Cieneba

Percent of map unit: 5 percent

Hydric soil rating: No

Las posas

Percent of map unit: 5 percent

Hydric soil rating: No

Custom Soil Resource Report

PfC—Placentia sandy loam, thick surface, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hbfm
Elevation: 50 to 2,500 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 200 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Placentia and similar soils: 85 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Placentia

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, rise
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 13 inches: sandy loam
H2 - 13 to 34 inches: clay, sandy clay
H2 - 13 to 34 inches:

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D

Custom Soil Resource Report

Ecological site: CLAYPAN (1975) (R019XD061CA)

Hydric soil rating: No

Minor Components

Bonsall

Percent of map unit: 5 percent

Hydric soil rating: No

Ramona

Percent of map unit: 5 percent

Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent

Landform: Depressions

Hydric soil rating: Yes

Rm—Riverwash

Map Unit Setting

National map unit symbol: hbg6

Elevation: 700 to 2,900 feet

Mean annual precipitation: 8 to 15 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 110 to 180 days

Farmland classification: Not prime farmland

Map Unit Composition

Riverwash: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riverwash

Setting

Landform: Drainageways

Parent material: Sandy, gravelly, or cobbly alluvium derived from mixed sources

Typical profile

H1 - 0 to 6 inches: gravelly coarse sand

H2 - 6 to 60 inches: stratified extremely gravelly coarse sand to gravelly sand

Properties and qualities

Slope: 0 to 4 percent

Natural drainage class: Excessively drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: About 60 to 72 inches

Frequency of flooding: Occasional

Available water storage in profile: Very low (about 1.9 inches)

Custom Soil Resource Report

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D

Hydric soil rating: Yes

TuB—Tujunga sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hbh0

Elevation: 10 to 2,500 feet

Mean annual precipitation: 10 to 25 inches

Mean annual air temperature: 59 to 64 degrees F

Frost-free period: 280 to 350 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Tujunga and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting

Landform: Flood plains

Landform position (three-dimensional): Riser, flat

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 14 inches: sand

H2 - 14 to 34 inches: loamy sand, fine sand, sand

H2 - 14 to 34 inches: stratified gravelly sand to gravelly loamy sand

H2 - 14 to 34 inches:

H3 - 34 to 60 inches:

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat excessively drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): 3s

Land capability classification (nonirrigated): 4e

Custom Soil Resource Report

Hydrologic Soil Group: A
Ecological site: SANDY (1975) (R019XD035CA)
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 5 percent
Hydric soil rating: No

Ramona

Percent of map unit: 5 percent
Hydric soil rating: No

Riverwash

Percent of map unit: 2 percent
Landform: Drainageways
Hydric soil rating: Yes

Visalia

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Landform: Flood plains
Hydric soil rating: Yes

VaA—Visalia sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hbh2
Elevation: 600 to 1,200 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 57 degrees F
Frost-free period: 200 to 350 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Visalia and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Visalia

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Riser, flat
Down-slope shape: Linear
Across-slope shape: Convex

Custom Soil Resource Report

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 12 inches: sandy loam

H2 - 12 to 40 inches: sandy loam, fine sandy loam

H2 - 12 to 40 inches: very fine sandy loam, loam

H3 - 40 to 60 inches:

H3 - 40 to 60 inches:

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Rare

Frequency of ponding: None

Available water storage in profile: Very high (about 14.1 inches)

Interpretive groups

Land capability classification (irrigated): 1

Land capability classification (nonirrigated): 2c

Hydrologic Soil Group: A

Hydric soil rating: No

Minor Components

Greenfield

Percent of map unit: 5 percent

Hydric soil rating: No

Grangeville

Percent of map unit: 5 percent

Hydric soil rating: No

Placentia

Percent of map unit: 2 percent

Hydric soil rating: No

Tujunga

Percent of map unit: 2 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

Landform: Flood plains

Hydric soil rating: Yes

VsE—Vista coarse sandy loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hbhc
Elevation: 400 to 3,900 feet
Mean annual precipitation: 10 to 18 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 210 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Vista and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vista

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from granodiorite and quartz-diorite

Typical profile

H1 - 0 to 15 inches: coarse sandy loam
H2 - 15 to 30 inches: coarse sandy loam, sandy loam
H2 - 15 to 30 inches: weathered bedrock
H3 - 30 to 34 inches:

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: LOAMY (1975) (R019XD029CA)
Hydric soil rating: No

Custom Soil Resource Report

Minor Components

Fallbrook

Percent of map unit: 10 percent

Hydric soil rating: No

Cieneba

Percent of map unit: 5 percent

Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

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APPENDIX D

GEOTECHNICAL BUSINESS COUNCIL INSERT

Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply this report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an

assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by:* the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help

others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.



8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

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PART VI

THIS PART WAS OMITTED

PART VII

**SPECIAL PROVISIONS - MODIFICATIONS TO
SECTIONS 1 THROUGH 9 AND SECTION 12
OF THE
CALTRANS STANDARD SPECIFICATIONS**

NOTE TO CONTRACTORS

The 2010 Standard Specifications can be found at
http://www.dot.ca.gov/hq/esc/oe/construction_contract_standards/std_specs/2010_StdSpecs/2010_StdSpecs.pdf.

Sections 1 through 9 and Section 12 of the Standard Specifications, dated 2010, State of California, Department of Transportation and the Amendments to Sections 1 through 9 and Section 12 of said Standard Specifications, contained in Part VI of these Contract Documents, are modified below. A modification to an amended subsection of Sections 1 through 9 or Section 12 shall take precedence over and be used in lieu of that modification to the unamended subsection.

CALTRANS STANDARD SPECIFICATIONS, DIVISION I – GENERAL PROVISIONS
SUBSECTION 1-1.07, DEFINITIONS

Add:

Attorney General. Wherever used in the Standard Specifications shall refer to County Counsel.

Standard Specifications. The Standard Specifications dated May 2010, State of California, Department of Transportation.

County. County of San Diego, a political subdivision of the State of California, as created by law.

Delete and Substitute:

Delete this section in its entirety and substitute the following:

Department, Also Department of Transportation: Wherever used in the Standard Specifications, refers to the Board, except when used in reference to test methods of, or to denote publications or designate the mailing address of an agency of the State of California.

Add:

Director. Also Director of Transportation: Means, wherever used in the Standard Specifications, the Board.

Division of Measurement Standards. Wherever used in the Standard Specifications, shall refer to the Department of Agriculture-Weights and Measures of the County of San Diego.

Engineer. The County Engineer, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them. Wherever used in the Standard Specifications, shall refer to the County Engineer.

Laboratory. The established laboratory authorized by the County Engineer to test materials used in the work.

Liquidated Damages. The amount prescribed in the specifications to be paid to the Owner or to be deducted from any payment due or to become due the Contractor for each day's delay in completing the whole or any specified portion of the work beyond the time allowed in the specifications.

Owner. The political subdivision of the State of California, as created by law, designated in the Notice to Contractors Inviting Bids.

Plans. At "The Standard Plans issued by the Department of Transportation.", delete the period and add: "and the San Diego Area Regional Standard Drawings."

State. Also, State of California. As used in these specifications relative to the contract administration, refers to the political subdivision indicated as the Owner in the Notice to Contractors Inviting Bids.

Proposal. "Contract Documents, including Plans, Specifications, and Proposal Forms are available to be downloaded, free of charge, from the Department of Purchasing & Contracting BuyNet website at: <http://buynet.sdcountry.ca.gov>".

CALTRANS STANDARD SPECIFICATIONS, DIVISION I – GENERAL PROVISIONS
SUBSECTION 2, BIDDING

No Modifications.

CALTRANS STANDARD SPECIFICATIONS, DIVISION I – GENERAL PROVISIONS
SUBSECTION 3, CONTRACT AWARD AND EXECUTION

Add:

3-1.02 Contract Bonds. Delete the first paragraph and substitute the following:

"The successful bidder shall furnish a surety bond as security for the faithful performance of the contract, and shall furnish a separate surety bond as security for the payment of all persons performing labor and furnishing materials in connection with the contract as specified by Chapter 5 (commencing at Section 3225) and Chapter 7 (commencing at Section 3247), Title 15, Part 4, Division 3, of the California Civil Code. The aforesaid bonds shall be in amounts as stated in the Notice to Contractors Inviting Bids and shall conform to the bond forms included in the Contract Documents for the project."

Delete:

3-1.07 Insurance Policies. Delete this section in its entirety.

Modify:

3-1.18 Contract Execution. Delete the first paragraph in its entirety and substitute the following:

"The contract shall be signed by the successful bidder and returned together with the contract bonds within 10 days, not including Saturdays, Sundays and legal holidays, of receiving notice that the contract has been awarded."

Replace the word "Office Engineer" with the County of San Diego, Department of Purchasing and Contracting Officer.

CALTRANS STANDARD SPECIFICATIONS, DIVISION I – GENERAL PROVISIONS
SUBSECTION 4, SCOPE OF WORK

No Modifications.

CALTRANS STANDARD SPECIFICATIONS, DIVISION I – GENERAL PROVISIONS
SUBSECTION 5, CONTROL OF WORK

Modify:

5-1.02 Contract Components. In the second paragraph delete Items 1 through 5 in their entirety and substitute the following:

“1. The governing ranking of contract parts in descending order is:

- 1.1.1 Special Provisions-Technical Provisions
 - 1.1.2 Special Provisions-Special Conditions
 - 1.2 Project plans
 - 1.3 Revised Standard Plans
 - 1.4 Standard Plans
 - 1.4.1 Modifications to Amendments to Section 1 through 9 and Section 12 of the Standard Specifications
 - 1.4.2 Modifications to Sections 1 through 9 and Section 12 of the Standard Specifications
 - 1.5 Amendments to the Standard Specifications
 - 1.6 Standard Specifications
 - 1.7 Project information
2. Written numbers and notes on a drawing govern over graphics
3. A detail drawing governs over a general drawing
4. A detail specification governs over a general specification
5. A specification in a section governs over a specification referenced by that section.”

CALTRANS STANDARD SPECIFICATIONS, DIVISION I – GENERAL PROVISION
SUBSECTION 6, CONTROL OF MATERIALS

Modify:

6-3.05A, General. In the table labeled “California Tests”, in the first line labeled “Relative Compaction” under the headings, delete “216 or 231” and substitute “216F”.

CALTRANS STANDARD SPECIFICATIONS, DIVISION I – GENERAL PROVISION
SUBSECTION 7, LEGAL RELATIONS AND RESPONSIBILITY

Delete: “7-1.06D Liability Insurance” and Add:

“7-1.06D(2) Liability Limits / Additional Insureds. Without limiting Contractor’s indemnification obligations under this Contract, Contractor shall provide at its sole expense and maintain during the term of this Contract, or as may be further required herein, the insurance specified in this Article. Contractor’s insurance shall protect Contractor against claims which may arise out of or result from Contractor’s operations under the Contract and for which Contractor may be legally liable, whether such operations are performed by Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

1. Minimum Scope of Insurance

Coverage shall be at least as broad as:

- A. Commercial General Liability, Occurrence form, Insurance Services Office form CG0001.
- B. Automobile Liability covering all owned, non owned and hired auto, Insurance Services Office form CA0001.
- C. Workers’ Compensation, as required by State of California and Employer’s Liability Insurance.
- D. Professional Errors and Omissions Liability required if Contractor provides or engages any type of professional services including but not limited to engineers and architects.

2. Minimum Limits of Insurance

The insurance required shall be written for not less than limits of liability specified in this Contract or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment. Coverages, except for Professional Errors and Omissions Liability, shall include a Waiver of Subrogation endorsement in favor of County of San Diego, the members of the Board of Supervisors of the County and the officers, agents, employees and volunteers of the County, individually and collectively. Contractor shall maintain limits no less than:

- A. Commercial General Liability including Premises, Operations, Products and Completed Operations, Contractual Liability, Independent Contractors Liability: \$1,000,000 per occurrence for bodily injury, personal injury, and property damage. . The General Aggregate limit shall be \$2,000,000 and shall be a Project Specific Aggregate. Contractor shall maintain Commercial General Liability (CGL) insurance, including Completed Operations and Products with a limit of not less than less than \$1,000,000 per occurrence for three (3) years following County filing of the Notice of Completion (NOC) for the contracted work.
- B. Automobile Liability: \$1,000,000 each accident for bodily injury and property damage. Coverage will include contractual liability equivalent to that provided in the 1990 and later editions of CA 0001.
- C. Worker’s Compensation and Employer’s Liability: \$1,000,000 each accident for bodily injury or disease.
- D. Professional Errors and Omissions Liability: \$1,000,000 per claim with an aggregate limit of not less than \$2,000,000. Any self retained limit shall not be greater than \$50,000 per

occurrence/event without County's Risk Manager's approval. Coverage shall include contractual liability coverage. If policy contains one or more aggregate limits, a minimum of 50% of any such aggregate limit must remain available at all times; if over 50% of any such aggregate limit has been paid or reserved, County will require additional coverage to be purchased by Contractor to restore the required limits. This coverage shall be maintained for a minimum of three years following termination or completion of Contractor's work pursuant to the Contract.

3. Deductibles and Self-Insured Retentions

Any deductible or self-insured retention must be declared to, stated on the Certificates of Insurance, and approved by County Risk Management. At the option of the County, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the County, the members of the Board of Supervisors of the County and the officers, agents, employees and volunteers; or the Contractor shall provide a financial guarantee satisfactory to the County, guaranteeing payment of losses and related investigations, claim administration and defense expenses.

4. Other Insurance Provisions

The general liability, automobile liability, and professional liability are to contain, or be endorsed to contain the following provisions:

- A. Additional Insured endorsement [Does not apply to professional liability]
Any general liability policy provided by Contractor shall contain an additional insured endorsement applying coverage to the County of San Diego, the members of the Board of Supervisors of the County and the officers, agents, employees and volunteers of the County, individually and collectively.
- B. Primary Insurance endorsement
For any claims related to this project, the Contractor's insurance coverage shall be primary insurance as respects the County, the members of the Board of Supervisors of the County and the officers, agents, employees and volunteers of the County, individually and collectively. Any insurance or self-insurance maintained by the County, its officers, employees, or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.
- C. Notice of Cancellation
Each required insurance policy shall be endorsed to state that coverage shall not be canceled by either party, except after thirty (30) days' prior written notice, or ten (10) days notice for non-payment of premium, by certified mail, return receipt requested, has been given to the County at the address shown in section of Contract entitled "Notices".
- D. Severability of Interest clause
General Liability and Auto Liability policy will contain clause that coverage applies separately to each insured, except with respect to the limits of liability, and that an act or omission by one of the named insureds shall not reduce or avoid coverage to the other named insureds.

General Provisions

5. Qualifying Insurers

All required policies of insurance shall be issued by companies which have been approved to do business in the State of California by the State Department of Insurance, and which hold a current policy holder's alphabetic and financial size category rating of not less than A-, VII according to the

current Best's Key Rating guide, or a company of equal financial stability that is approved by County's Risk Manager.

6. Evidence of Insurance

Prior to commencement of this Contract, but in no event later than the effective date of the Contract, Contractor shall furnish the County with certificate of insurance and amendatory endorsements effecting coverage required by this clause. If requested by the County in writing, the Contractor shall furnish certified copies of the actual required insurance policies within thirty (30) days after effective receipt of such request. Thereafter, copies of renewal policies (if requested), certificate and amendatory endorsements shall be furnished to County within thirty (30) days of the expiration of the term of any required policy. Contractor shall permit County at all reasonable times to inspect any policies of insurance which Contractor has not delivered to County.

7. Failure to Obtain or Maintain Insurance; County's Remedies

Contractor's failure to provide insurance specified or failure to deliver certified copies of policies or certificates of insurance, or failure to make premium payments required by such insurance, shall constitute a material breach of the Contract, and County may, at its option, terminate the Contract for any such default by Contractor.

8. No Limitation of Obligations

The foregoing insurance requirements as to the types and limits of insurance coverage to be maintained by Contractor, and any approval of said insurance by the County are not intended to and shall not in any manner limit or qualify the liabilities and obligations otherwise assumed by Contractor pursuant to the Contract, including, but not limited to, the provisions concerning indemnification.

9. No Recourse

The insurer shall have no recourse against County for payment of any premium or for assessments under any insurance policy maintained in connection with this Contract.

10. Review of Coverage

County retains the right at any time to review the coverage, form and amount of insurance required herein and may require contractor to obtain insurance reasonably sufficient in coverage, form and amount to provide adequate protection against the kind and extent of risk which exists at the time a change in insurance is required.

11. Self-Insurance

Contractor may, with the prior written consent of County Risk Management, fulfill some or all of the insurance requirements contained in the Contract under a plan of self-insurance. Contractor shall only be permitted to utilize such self-insurance if in the opinion of County Risk Management, Contractor's (i) net worth, and (ii) reserves for payment of claims of liability against Contractor, are sufficient to adequately compensate for the lack of other insurance coverage required by this Contract. Contractor's utilization of self-insurance shall not in any way limit liabilities assumed by Contractor under the Agreement.

12. Claims Made Coverage

If coverage is written on a "claims made" basis, the Certificate of Insurance shall clearly so state. In addition to the coverage requirements specified above, such policy shall provide that:

- A. The policy retroactive date coincides with or precedes Contractor's commencement of work under the Contract (including subsequent policies purchased as renewals or replacements).

- B. Contractor will make every effort to maintain similar insurance during the required extended period of coverage following expiration of the Contract, including the requirement of adding all additional insureds.
- C. If insurance is terminated for any reason, Contractor shall purchase an extended reporting provision of at least three (3) years to report claims arising in connection with the Contract.
- D. The policy allows for reporting of circumstances or incidents that might give rise to future claims.

13. Subcontractors' Insurance

Contractor shall require that any and all subcontractors hired by Contractor are insured in accordance with this Contract. If any subcontractor's coverage does not comply with the foregoing provisions, Contractor shall defend and indemnify the County from any damage, loss, cost, or expense, including attorneys' fees, incurred by County as a result of subcontractors failure to maintain required coverage.

In addition to the foregoing, Contractor shall require that any and all subcontractors performing any excavation of the Project have Explosion, Collapse and Underground Damage Liability Insurance and coverage in the amount of One Million Dollars (\$1,000,000) per occurrence.

14. Waiver of Subrogation

The insurer shall waive all rights of recovery or subrogation against County, its agents, officers and employees which might arise by reason of any payment under the policies. Contractor hereby waives all rights to recovery against County, its agents, officers and employees, on account of loss or damage occasioned to Contractor or others under Contractor's control to the extent such loss or damage is insured against under any insurance policies which may be in force at the time of the loss or damage. Included in any policy or policies of insurance provided by Contractor, shall be a standard Waiver of Rights of Subrogation against County by the insurance company issuing said policy or policies. This provision does not apply to Professional Liability coverage.

Contractor's Bonds. Prior to execution of the Contract, Contractor shall file with the County on the approved forms, the two surety bonds in the amounts and for the purposes noted below, duly executed by a reputable surety company satisfactory to County, and Contractor shall pay all premiums and costs thereof and incidental thereto, as security for payment of persons named in California Civil Code Section 3181 or amounts due under Unemployment Insurance Code with respect to Work or Labor performed by any such claimant. All alterations, time extensions, extra and additional work, and other changes authorized by the Specifications, or any part of the Contract, may be made without securing consent of the surety or sureties on the contract bonds. Each bond shall be signed by both Contractor and the sureties.

- A. The Payment Bond for public works shall be in an amount of one hundred percent (100%) of the Contract price, as determined from the prices in the bid form, and shall insure to the benefit of persons performing labor or furnishing materials in connection with the work of the proposed Contract. This bond shall be maintained in full force and effect until all work under the Contract is completed and accepted by the County, and until all claims for materials and labor have been paid.
- B. The Performance Bond shall be in an amount of one percent (100%) of the Contract price as determined from the prices in the bid form, and shall insure the faithful performance by the Contractor of all work under the Contract. It shall also insure the replacing of, or making acceptable, any defective materials or faulty workmanship.

- C. Qualification of Sureties. Should any surety or sureties be deemed unsatisfactory at any time by the County, notice will be given Contractor to that effect, and Contractor shall substitute a new surety or sureties satisfactory to the County. No further payment shall be deemed due or will be made under the contract until the sureties qualify and are accepted by the County.

Miscellaneous. Nothing contained in the Contract is intended to make the public or any member thereof a third party beneficiary of the Insurance, Indemnity or Bonding provisions of these Standard Specifications, nor is any term, condition or other provision of the Contract intended to establish a standard of care owed to the public or any member thereof."

Rights in Land and Improvements. "The Contractor shall not occupy State-owned property outside the right of way as shown on the plans or maps available in the County Engineer's office, unless he enters into a rental agreement with the Department. The agreement will be based on the fair rental values."

CALTRANS STANDARD SPECIFICATIONS, DIVISION I – GENERAL PROVISION SUBSECTION 8, PROSECUTION AND PROGRESS

Delete and Substitute:

8-1.13 Contractor's Control Termination. Delete this section in its entirety and substitute the following:

"If the Engineer deems that a Contractor has failed to supply an adequate working force, or material of proper quality, or has failed in any other respect to prosecute the work with the diligence and force specified by the contract, the Director of Purchasing and Contracting may:

1. After written notice of at least five (5) days to the Contractor, specifying the defaults to be remedied, provide any such labor or materials and deduct the cost from any money due or to become due to the Contractor under the contract; or
2. If it considers that the failure is sufficient ground for such action, the Director of Purchasing and Contracting may give written notice of at least five (5) days to the Contractor and the Contractor's sureties, that if the defaults are not remedied the Contractor's control over the work will be terminated.

If the defaults are not remedied within the time specified in the notice, the Contractor's control shall terminate as of the expiration of that time.

"In the event of such termination, the County shall immediately serve written notice thereof upon surety and Contractor. Surety shall have the rights and obligations set forth in the performance bond. Subject to the surety's rights under the performance bond (which rights are waived upon a default under the performance bond), the County may, at its sole option, take over the Work and prosecute it to completion by contract or by any other methods it may deem advisable, or require the surety to prosecute the Work to completion. The County may take possession of and use all or any part of the Contractor's materials, tools, equipment, and appliances upon the premises to complete the contract. The County may effectuate the provisions of this paragraph through any necessary written agreement with the Surety, Contractor, or other contractors.

"If the Contractor's control of the work is terminated or the Contractor abandons the work and the contract work is completed in conformance with the provisions of this subsection, any dispute concerning the amount to be paid by the Owner to the Contractor or its Surety or to be paid to the

Owner by the Contractor or its Surety shall be subject to arbitration in accordance with the provisions of Section 9-1.10, "Arbitration", of the Standard Specifications. The Surety shall be bound by the arbitration award and is entitled to participate in such arbitration proceedings."

CALTRANS STANDARD SPECIFICATIONS, DIVISION I – GENERAL PROVISION
SUBSECTION 9, MEASUREMENT AND PAYMENT

Add:

9-1.22 Arbitration. Add the following at the end of the first paragraph:

"However, any unresolved claims shall be resolved by first submitting such claims to mediation prior to their being taken to formal arbitration or litigation by any party, pursuant to the Special Condition entitled either "Claims" or "Dispute and Claims Resolution" in the Contract Documents for the project."

Change the capital "C" in "Claims" to a small "c" and add the following at the beginning of the second paragraph:

"Any mediated, yet still unresolved"

Delete and Substitute:

Delete the last sentence of the last paragraph, and substitute the following:

"A Complaint in Arbitration by the Contractor shall be made not later than 60 days after completion or termination of mediation on the claim."

CALTRANS STANDARD SPECIFICATIONS, DIVISION II – GENERAL CONSTRUCTION
SUBSECTION 10, GENERAL

No Modifications.

CALTRANS STANDARD SPECIFICATIONS, DIVISION II – GENERAL CONSTRUCTION
SUBSECTION 11, QUALITY CONTROL AND ASSURANCE

No Modifications.

CALTRANS STANDARD SPECIFICATIONS, DIVISION II – GENERAL PROVISION
SUBSECTION 12, TEMPORARY TRAFFIC CONTROL

Delete and Substitute:

12-1.03 Flagging Costs. In the first sentence delete "You and the State share" and substitute "Contractor is responsible to pay for 100% of cost to furnish all flaggers, including transporting flaggers and furnishing stands and towers for flaggers to provide for passage of traffic through the work as specified in section 7-1.03 and 7-1.04."

END OF SECTION

PART VIII

THIS PART WAS OMITTED