Business Services
Contracts Office
5735 47th Avenue ● Sacramento, CA 95824
(916) 643-2464
Rose Ramos, Chief Business Officer
Robert Aldama, Purchasing Manager II

ADDENDUM NO. 1

Date: 4/19/2023

Issued by: Sacramento City Unified School District

Project: **Project #: 0530-434**
Luther Burbank High School Academic Core Renovation, Phase #2

This addenda shall supersede the original Information, attachments, and specifications regarding Project No.**0530-434** where it adds to, deletes from, clarifies or otherwise modifies them. All other conditions and any previous addenda shall remain unchanged.

Part A – Bidding and Contract Requirements

AD1.01 REPLACE Project Manual with DSA-APPROVED # 02-120957 Project Manual

Part B – TECHNICAL REQUIREMENTS

AD1.02 REPLACE Project Manual with DSA-APPROVED # 02-120957 Project Manual

Part C - DRAWINGS

AD1.03 REPLACE drawings with DSA-APPROVED # 02-120957 Plan Set

END OF ADDENDUM NO.1

Acknowledgement of this Addendum will be required at time of bid:

HMC ARCHITECTS
2101 Capitol Ave, Suite 100
Sacramento, California 95816

April 18, 2023

Luther Burbank HS Improvements, Sacramento
HMC # 3186068100
DSA # DSA # 02-120957

ADDENDUM NO. 1

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

ATTACHMENTS

DSA approved plans
DSA approved Project Manual
DSA approved Form DSA 103

HMC ARCHITECTS

By_____
(Signature of Licensed Architect of Record or Alternate)

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

Application Number:	**School Name:**	**School District:**	
01-120957	Luther Burbank High School	Sacramento City Unified School District	SSS: no comments
DSA File Number:	**Increment Number:**	**Date Created:**	
34-H7		2023-02-08 16:54:04	

2022 CBC

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required **Periodic** – Indicates that a periodic special inspection is required **Test** – Indicates that a test is required	**GE (Geotechnical Engineer)** – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative. **LOR (Laboratory of Record)** – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335. **PI (Project Inspector) –** Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA. **SI (Special Inspection)** – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number:	**School Name:**	**School District:**
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34-H7		2023-02-08 16:54:04

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

	S1. GENERAL:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify that: • Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations. • Foundation excavations are extended to proper depth and have reached proper material. • Materials below footings are adequate to achieve the design bearing capacity.	**See Notes**	**PI**	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations is not permitted without a geotechnical report.

	S2. SOIL COMPACTION AND FILL:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	**Continuous**	**LOR***	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
☑	**b.** Compaction testing.	**Test**	**LOR***	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

	S3. DRIVEN DEEP FOUNDATIONS (PILES):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Verify pile materials, sizes and lengths comply with the requirements.	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative.
☐	**b.** Determine capacities of test piles and conduct additional load tests as required.	**Test**	**LOR***	* Under the supervision of the geotechnical engineer.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number:	**School Name:**	**School District:**
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DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	**c.** Inspect driving operations and maintain complete and accurate records for each pile.	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative.
☐	**d.** Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative.
☐	**e.** Steel piles.	Provide tests and inspections per STEEL section below.		
☐	**f.** Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
☐	**g.** For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Note**
☐	**a.** Inspect drilling operations and maintain complete and accurate records for each pier.	**Continuous**	**PI**	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
☐	**b.** Verify pier locations, diameters, plumbness and lengths.Record concrete or grout volumes.	**Continuous**	**PI**	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
☐	**c.** Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

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34-H7		2023-02-08 16:54:04

	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
	S5. RETAINING WALLS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Placement, compaction and inspection of backfill.	**Continuous**	**GE***	**1705A.6.1.** * By geotechnical engineer or his or her qualified representative. (See section S2 above).
☐	**b.** Placement of soil reinforcement and/or drainage devices.	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative.
☐	**c.** Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
☐	**d.** Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
☐	**e.** Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Soil Improvements	**Test**	**GE***	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
☐	**b.** Inspection of Soil Improvements	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative.
☐	**c.**			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number:	**School Name:**	**School District:**
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34-H7		2023-02-08 16:54:04

	C1. CAST-IN-PLACE CONCRETE			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify use of required design mix.	**Periodic**	**SI**	**Table 1705A.3 Item 5, 1910A.1.**
☑	**b.** Identifiy, sample, and test reinforcing steel.	**Test**	**LOR**	**1910A.2;** ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
☑	**c.** During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	**Test**	**LOR**	**Table 1705A.3 Item 6**; ACI 318-19 Sections 26.5 & 26.12.
☑	**d.** Test concrete (f'_c).	**Test**	**LOR**	**1905A.1.17;** ACI 318-19 Section 26.12.
☑	**e.** Batch plant inspection: **Periodic**	**See Notes**	**SI**	Default of **'Continuous'** per **1705A.3.3**. If approved by DSA, batch plant inspection may be reduced to **'Periodic'** subject to requirements in Section **1705A.3.3.1,** or eliminated per **1705A.3.3.2.** See IR 17-13. (See Appendix (end of this form) for exemptions.)
☐	**f.** Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

	C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Sample and test prestressing tendons and anchorages.	**Test**	**LOR**	**1705A.3.4, 1910A.3**
☐	**b.** Inspect placement of prestressing tendons.	**Periodic**	**SI**	**1705A.3.4, Table 1705A.3 Items 1 & 9.**

	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	**c.** Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	**Periodic**	**SI**	**Table 1705A.3 Item 13.** Special inspector to verify specified concrete strength test prior to stressing.
☐	**d.** Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	**Continuous**	**SI**	**1705A.3.4, Table 1705A.3 Item 9;** ACI 318-14 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect fabrication of precast concrete members.	**Continuous**	**SI**	ACI 318-19 Section 26.13.
☐	**b.** Inspect erection of precast concrete members.	**Periodic**	**SI***	**Table 1705A.3 Item 10.** * May be performed by PI when specifically approved by DSA.
☐	**c.** For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	**Continuous**	**SI**	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
☐	**d.** Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	**Periodic**	**SI**	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

	C4. SHOTCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect shotcrete placement for proper application techniques.	**Continuous**	**SI**	**1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3.** See ACI 506.2-13 Section 3.4, ACI 506R-16.
☐	**b.** Sample and test shotcrete (f'_c).	**Test**	**LOR**	**1908A.2, 1705A.3.9**

	C5. POST-INSTALLED ANCHORS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Inspect installation of post-installed anchors	**See Notes**	**SI***	**1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8** (See Appendix (end of this form) for exemptions). ACI 318-14 Sections 17.8 & 26.13. * May be performed by the project inspector when specifically approved by DSA.
☑	**b.** Test post-installed anchors.	**Test**	**LOR**	**1910A.5.** (See Appendix (end of this form) for exemptions.)

	C6. OTHER CONCRETE:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.**			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number:	**School Name:**	**School District:**
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

	S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	**Periodic**	*	**Table 1705A.2.1 Item 3a–3c.** 2202A.1**;** AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
☑	**b.** Test unidentified materials	**Test**	**LOR**	**2202A.1.**
☑	**c.** Examine seam welds of HSS shapes	**Periodic**	**SI**	DSA IR 17-3.
☑	**d.** Verify and document steel fabrication per DSA-approved construction documents.	**Periodic**	**SI**	Not applicable to cold-formed steel light-frame construction, except for trusses (**1705A.2.4**).
☐	**e.** Buckling restrained braces.	**Test**	**LOR**	Testing and special inspections in accordance with IR 22-4.

	S/A2. HIGH-STRENGTH BOLTS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	**Periodic**	**SI**	**Table 1705A.2.1 Items 1a & 1b, 2202A.1;** AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
☐	**b.** Test high-strength bolts, nuts and washers.	**Test**	**LOR**	**Table 1705A.2.1 Item 1c, 2213A.1**; RCSC 2014 Section 7.2; DSA IR 17-8.
☐	**c.** Bearing-type ("snug tight") connections.	**Periodic**	**SI**	**Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2**; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
☐	**d.** Pretensioned and slip-critical connections.	*	**SI**	**Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2;** AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. *"Continuous" or "Periodic" depends on the tightening method used.

	S/A3. WELDING:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	**Periodic**	**SI**	**1705A.2.5, Table 1705A.2.1 Items 4 & 5**; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
☑	**b.** Verify weld filler material manufacturer's certificate of compliance.	**Periodic**	**SI**	DSA IR 17-3.
☑	**c.** Verify WPS, welder qualifications and equipment.	**Periodic**	**SI**	DSA IR 17-3.

	S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	**Continuous**	**SI**	**Table 1705A.2.1 Items 5a.1–4;** AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
☑	**b.** Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	**Periodic**	**SI**	**1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6;** AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
☐	**c.** Inspect welding of stairs and railing systems.	**Periodic**	**SI**	**1705A.2.1**; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
☐	**d.** Verification of reinforcing steel weldability other than ASTM A706.	**Periodic**	**SI**	**1705A.3.1**; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
☐	**e.** Inspect welding of reinforcing steel.	**Continuous**	**SI**	**Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8;** AWS D1.4; DSA IR 17-3.

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	**Continuous**	**SI**	**Table 1705A.2.1 Items 5a.1–4;** AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
☐	**b.** Inspect single-pass fillet welds ≤ 5/16".	**Periodic**	**SI**	**Table 1705A.2.1 Item 5a.5;** AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
☐	**c.** Inspect end-welded studs (ASTM A-108) installation (including bend test).	**Periodic**	**SI**	**2213A.2**; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
☐	**d.** Inspect floor and roof deck welds.	**Periodic**	**SI**	**1705A.2.2, Table 1705A.2.1 Item 5a.6;** AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
☐	**e.** Inspect welding of structural cold-formed steel.	**Periodic**	**SI***	**1705A.2.5; AWS D1.3; DSA IR 17-3.** The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
☐	**f.** Inspect welding of stairs and railing systems.	**Periodic**	**SI***	**1705A.2.1;** AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
☐	**g.** Verification of reinforcing steel weldability.	**Periodic**	**SI**	**1705A.3.1**; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
☐	**h.** Inspect welding of reinforcing steel.	**Continuous**	**SI**	**Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8;** AWS D1.4; DSA IR 17-3.

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Ultrasonic	**Test**	**LOR**	**1705A.2.1, 1705A.2.5;** AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
☐	**b.** Magnetic Particle	**Test**	**LOR**	**1705A.2.1, 1705A.2.5;** AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
☐	**c.**	**Test**	**LOR**	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	**Continuous**	**SI**	**1705A.2.3, Table 1705A.2.3;** AWS D1.1; DSA IR 22-3 for steel joists only. **1705A.2.4;** AWS D1.3 for cold-formed steel trusses.

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	**Periodic**	**SI**	**1705A.15, 1705A.1, 1705A.2, 1705A.3, 1705A.4.**
☐	**b.** Test density.	**Test**	**LOR**	**1705A.15.1, 1705A.15.5, ASTM E736**
☐	**c.** Bond strength adhesion/cohesion.	**Test**	**LOR**	**1705A.15.1, 1705A.15.4, ASTM E605**

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Anchor Bolts and Anchor Rods	**Test**	**LOR**	Sample and test anchor bolts and anchor rods not readily identifiable per procedures noted in DSA IR 17-11.
☐	**b.** Threaded rod not used for foundation anchorage.	**Test**	**LOR**	Sample and test threaded rods not readily identifiable per procedures noted in DSA IR 17-11.

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	**Periodic**	**SI**	Table 1705A.13.7
☐	**b.** Fabricated storage rack elements.	**Periodic**	**SI**	1704A.2.5; Table 1705A.13.7

	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	**c.** Storage rack anchorage installation.	**Periodic**	**SI**	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
☐	**d.** Completed storage rack system to indicate compliance with the approved construction documents.	**Periodic**	**SI***	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.**			

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number:	**School Name:**	**School District:**
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

Exempt items given in DSA IR A-22 or the 2019 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests **/** special inspections noted. **Items marked as exempt shall be identified on the approved construction documents**. The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
☐	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
☐	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill.

	CONCRETE/MASONRY:
☐	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
☐	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
☐	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition.
☐	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number:	**School Name:**	**School District:**
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

	CONCRETE/MASONRY:
☐	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
☐	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
☐	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
☐	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
☐	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
☐	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
☐	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).
☐	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number: 01-120957	**School Name:** Luther Burbank High School	**School District:** Sacramento City Unified School District
DSA File Number: 34-H7	**Increment Number:**	**Date Created:** 2023-02-08 16:54:04

Name of Architect or Engineer in general responsible charge:

Jeff Grau

Name of Structural Engineer (When structural design has been delegated):

Greg Richards

Signature of Architect or Structural Engineer: Greg Richards

Date: *February 8, 2023*

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-120957 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 04/12/2023

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number:	School Name:	School District:
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291
2. Concrete Batch Plant Inspection: Laboratory Verified Report Form DSA 291
3. Post-installed Anchors: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292
4. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

rga + A studio of HMC Architects

Project Manual

Luther Burbank High School Improvements

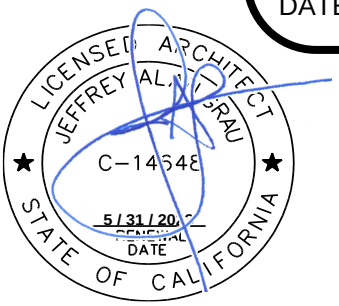
Sacramento City Unified School District
Sacramento, California

RGA Job Number 3186068-100
DSA Application Number 02-120957
February 9, 2023

2101 Capitol Avenue, Suite 100, Sacramento CA 95816 | 916.368.7990 | rainforthgrau.com

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-120957 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 04/12/2023

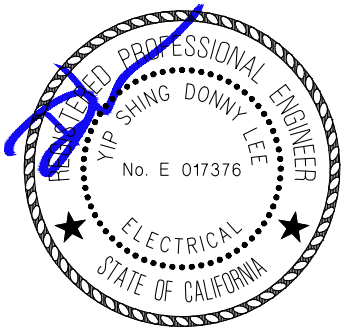
Architect
Rainforth Grau Architects
2101 Capitol Avenue, Suite 100
Sacramento, CA 95816
916.368.7990



Structural Engineer
RW Consulting Engineers, Inc.
1450 Harbor Blvd., Suite F
Sacramento, CA 95691
(916) 716-6910

Mechanical Engineer
Capital Engineering Consultants
11020 Sun Center Drive, Suite 100,
Rancho Cordova, CA 95670
(916) 851-3500 Fax (916) 631-4424

Electrical Engineer
EDGE Electrical Consulting
1801 7th Street, Suite 150
Sacramento, CA 95811
(916) 256-2460



04/03/2023

TABLE OF CONTENTS

TABLE OF CONTENTS

BID/PROJECT MANUAL

PROJECT/CONTRACT NUMBER: 0530-434

Luther Burbank High School Core Academic Renovation Phase #2

SACRAMENTO CITY UNIFIED SCHOOL DISTRICT

March 31, 2023

DOCUMENT 00 01 10

TABLE OF CONTENTS

DOCUMENT 00 01 15

LIST OF DRAWINGS AND TABLES

DRAWINGS

Sheet number	File number	Description

TABLES

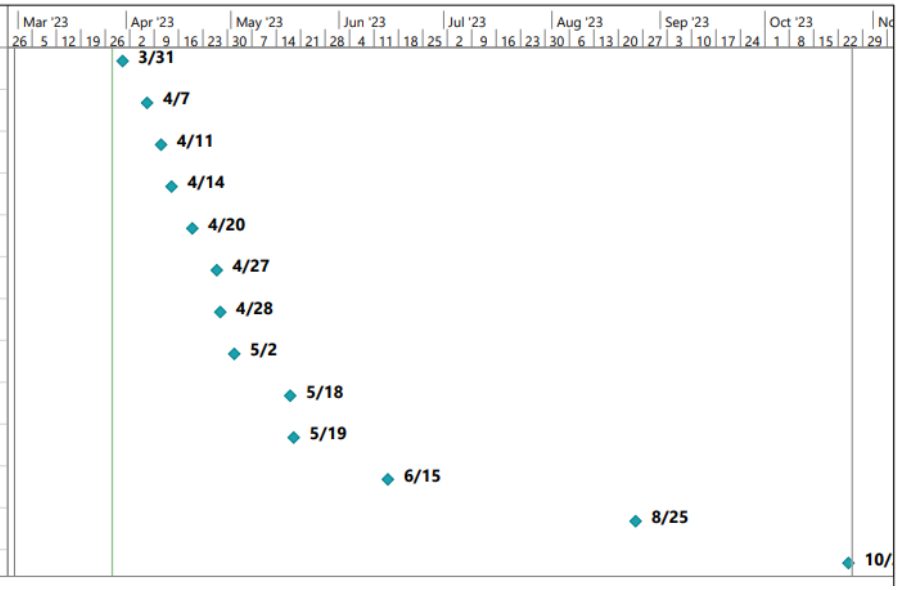
END OF DOCUMENT

DOCUMENT 00 01 20

LIST OF SCHEDULES

SCHEDULES

ID	Task Name	Start
1	1st advertisement	Fri 3/31/23
2	2nd advertisement	Fri 4/7/23
3	Bid walk	Tue 4/11/23
4	RFI questions	Fri 4/14/23
5	RFI Responses	Thu 4/20/23
6	Bids due	Thu 4/27/23
7	Bid review	Fri 4/28/23
8	Board package to contracts	Tue 5/2/23
9	Board meeting	Thu 5/18/23
10	Notice of award	Fri 5/19/23
11	Construction begins	Thu 6/15/23
12	Construction ends	Fri 8/25/23
13	Closeout	Wed 10/25/23



END OF DOCUMENT

DOCUMENT 00 11 16

NOTICE TO BIDDERS

1. Notice is hereby given that the governing board ("Board") of the Sacramento City Unified School District ("District") will receive sealed bids for the following project, **Bid No. 0530-434**("Project" or "Contract"):

   Luther Burbank High School Core Academic Renovation Phase #2

2. The Project consists of:

   Exterior paint of complete campus, sealing of masonry, distribution of electrical outlets to classroom wings, abatement of existing classroom wing floors, installation of new LVT flooring, interior paint of classrooms, cleaning and buffing of interior shop floors, removal and replacement of concrete walkway in front of classrooms for ADA compliance, removal of existing Marquee and installation of new marquee, rework of existing HVAC duct controls and replacement of rooftop AC unit in building A and all other work identified in the plans and specifications. Engineers estimate for this project is $ 4,100,000.

3. To bid on this Project, the Bidder is required to possess one or more of the following State of California contractors' license(s)**: Contractors B license.**

   The Bidder's license(s) must remain active and in good standing throughout the term of the Contract.

4. To bid on this Project, the Bidder is required to be registered as a public works contractor with the Department of Industrial Relations pursuant to the Labor Code.

5. Contract Documents will be available on or after **March 31, 2023**, and may be downloaded from the District's website, https://gateway.app.e-builder.net/app/bidders/landing?bidpackageid=5e1db17d-c320-459d-946f-b6aac10e6405

6. Sealed bids will be received until **2:00 p.m., Thursday, April 27, 2023, at the District Office, Serna Center, 5735 47th Avenue, Sacramento, California 95824** at or after which time the bids will be opened and publicly read aloud. Any bid that is submitted after this time shall be nonresponsive and returned to the bidder. Any claim by a bidder of error in its bid must be made in compliance with section 5100 et seq. of the Public Contract Code.

7. Pursuant to Public Contract Code section 20111.6, only prequalified bidders will be eligible to submit a bid for contracts $1 million or more using or planning to use state bond funds. Any bid submitted by a bidder who is not prequalified shall be non-responsive and returned unopened to the bidder. Moreover, any bid listing subcontractors holding C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43 or C-46 licenses who have not been prequalified shall be deemed nonresponsive.

8. All bids shall be on the form provided by the District. Each bid must conform and be responsive to all pertinent Contract Documents, including, but not limited to, the Instructions to Bidders.

9. A bid bond by an admitted surety insurer on the form provided by the District a cashier's check or a certified check, drawn to the order of the Sacramento City Unified School District, in the amount of ten percent (10%) of the total bid price, shall accompany the Bid Form and Proposal, as a guarantee that the Bidder will, within seven (7) calendar days after the date of the Notice of Award, enter into a contract with the District for the performance of the services as stipulated in the bid.

10. A mandatory pre-bid conference and site visit will be held on **Tuesday, April 11, 2023, at 11:30 a.m. at Luther Burbank High School, 3500 Florin Road, Sacramento, California 95823**. All participants are required to sign in front of the Administration Building. The site visit is expected to take approximately 1 Hour. Failure to attend or tardiness will render the bid ineligible.

11. The successful Bidder shall be required to furnish a 100% Performance Bond and a 100% Payment Bond if it is awarded the Contract for the Work.

12. Pursuant to Education Code section 17550, the District is requiring the Bidder to purchase and to remove from the school grounds all old materials required by the specifications to be removed from any existing school building on the same school grounds and not required for school purposes and to state in his or her bid the amount which he or she will deduct from the price bid for the work as the purchase price of the old materials. The board shall let the contract to any responsible bidder whose net bid is the lowest or shall reject all bids.

13. The successful Bidder may substitute securities for any monies withheld by the District to ensure performance under the Contract, in accordance with the provisions of section 22300 of the Public Contract Code.

14. The successful bidder will be required to certify that it either meets the Disabled Veteran Business Enterprise ("DVBE") goal of three percent (3%) participation or made a good faith effort to solicit DVBE participation in this Contract if it is awarded the Contract for the Work.

15. The Contractor and all Subcontractors under the Contractor shall pay all workers on all Work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to section 1770 et seq. of the California Labor Code. Prevailing wage rates are also available from the District or on the Internet at: <http://www.dir.ca.gov>.

16. This Project is subject to labor compliance monitoring and enforcement by the Department of Industrial Relations pursuant to Labor Code section 1771.4 and subject to the requirements of Title 8 of the California Code of Regulations. The successful Bidder shall comply with all requirements of Division 2, Part 7, Chapter 1, Articles 1-5 of the Labor Code.

17. The District has entered into a Project Labor Agreement that is applicable to this Project. A copy of the Project Labor Agreement is available for review at the District Facilities Office and may be downloaded from the District's website, http://www.scusd.edu/pod/project-labor-agreement. The successful bidder and all subcontractors will be required to agree to be bound by the Project Labor Agreement.

18. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder based on:

    A. The base bid amount only.

19. The Board reserves the right to reject any and all bids and/or waive any irregularity in any bid received. If the District awards the Contract, the security of unsuccessful bidder(s) shall be returned within sixty (60) days from the time the award is made. Unless otherwise required by law, no bidder may withdraw its bid for ninety (90) days after the date of the bid opening.

END OF DOCUMENT

DOCUMENT 00 21 13

INSTRUCTIONS TO BIDDERS

Bidders shall follow the instructions in this document, and shall submit all documents, forms, and information required for consideration of a bid.

Sacramento City Unified School District ("District") will evaluate information submitted by the apparent low Bidder and, if incomplete or unsatisfactory to District, Bidder's bid may be rejected at the sole discretion of District.

1. Bids are requested for a general construction contract, or work described in general, for the following project ("Project" or "Contract"):

   Luther Burbank HS Core Academic Renovation Phase #2

2. A Bidder and its subcontractors must possess the appropriate State of California contractors' license and must maintain the license throughout the duration of the project. Bidders must also be registered as a public works contractor with the Department of Industrial Relations pursuant to the Labor Code. Bids submitted by a contractor who is not properly licensed or registered shall be deemed nonresponsive and will not be considered.

3. The District has prequalified bidders pursuant to Public Contract Code section 20111.6 for contracts $1 million or more using or planning to use state bond funds. Only prequalified bidders will be eligible to submit a bid for this Project. Any bid submitted by a bidder who is not prequalified shall be deemed nonresponsive and will not be considered. Moreover, any bid listing subcontractors holding C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43 or C-46 licenses who have not been prequalified shall be deemed nonresponsive.

4. District will receive sealed bids from bidders as stipulated in the Notice to Bidders.

   a. All bids must be sealed in an envelope, marked with the name and address of the Bidder, name of the Project, the Project Number and/or bid number, and time of bid opening.

   b. Bids must be submitted to the District Office by date and time shown in the Notice to Bidders.

   c. Bids must contain all documents as required herein.

5. Bidders are advised that on the date that bids are opened, telephones will not be available at the District Offices for use by bidders or their representatives.

6. Bids will be opened at or after the time indicated for receipt of bids.

7. Bidders must submit bids on the documents titled Bid Form and Proposal, and must submit all other required District forms. Bids not submitted on the District's required forms shall be deemed nonresponsive and shall not be considered. Additional sheets required to fully respond to requested information are permissible.

8. Bidders shall not modify the Bid Form and Proposal or qualify their bids. Bidders shall not submit to the District a re-formatted, re-typed, altered, modified, or otherwise recreated version of the Bid Form and Proposal or other District-provided document.

9. Bids shall be clearly written and without erasure or deletions. District reserves the right to reject any bid containing erasures, deletions, or illegible contents.

10. Bidders must supply all information required by each Bid Document. Bids must be full and complete. District reserves the right in its sole discretion to reject any bid as nonresponsive as a result of any error or omission in the bid. Bidders must complete and submit all of the following documents with the Bid Form and Proposal:

    a. Bid Bond on the District's form, or other security.

    b. Designated Subcontractors List.

    c. Site Visit Certification, if a site visit was required.

    d. Non-Collusion Declaration.

    e. Iran Contracting Act Certification if contract value is $1,000,000 or more.

11. Bidders must submit with their bids cash, a cashier's check or a certified check payable to District, or a bid bond by an admitted surety insurer of not less than ten percent (10%) of amount of Base Bid, plus all additive alternates ("Bid Bond"). If Bidder chooses to provide a Bid Bond as security, Bidder must use the required form of corporate surety provided by District. The Surety on Bidder's Bid Bond must be an insurer admitted in the State of California and authorized to issue surety bonds in the State of California. Bids submitted without necessary bid security will be deemed nonresponsive and will not be considered.

12. If Bidder to whom the Contract is awarded fails or neglects to enter into the Contract and submit required bonds, insurance certificates, and all other required documents, within **SEVEN (7)** calendar days after the date of the Notice of Award, District may deposit Bid Bond, cash, cashier's check, or certified check for collection, and proceeds thereof may be retained by District as liquidated damages for failure of Bidder to enter into Contract, in the sole discretion of District. It is agreed that calculation of damages District may suffer as a result of Bidder's failure to enter into the Contract would be extremely difficult and impractical to determine and that the amount of the Bidder's required bid security shall be the agreed and conclusively presumed amount of damages.

13. Bidders must submit with the bid the Designated Subcontractors List for those subcontractors who will perform any portion of Work, including labor, rendering of service, or specially fabricating and installing a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in excess of one half of one percent (0.5%) of total bid. Failure to submit this list when required by law shall result in bid being deemed nonresponsive and the bid will not be considered.

14. All of the listed subcontractors are required to be registered as a public works contractor with the Department of Industrial Relations pursuant to the Labor Code.

    a. An inadvertent error in listing the California contractor license number on the Designated Subcontractors List shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive if the correct contractor's license number is submitted to the District within 24 hours after the bid opening and the corrected number corresponds with the submitted name and location for that subcontractor.

    b. An inadvertent error listing an unregistered subcontractor shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive provided that any of the following apply:

        (1) The subcontractor is registered prior to the bid opening.

        (2) The subcontractor is registered and has paid the penalty registration fee within 24 hours after the bid opening.

        (3) The subcontractor is replaced by another registered subcontractor pursuant to Public Contract Code section 4107.

15. If a mandatory pre-bid conference and site visit ("Site Visit") is required as referenced in the Notice to Bidders, then Bidders must submit the Site Visit Certification with their Bid. District will transmit to all prospective Bidders of record such Addenda as District in its discretion considers necessary in response to questions arising at the Site Visit. Oral statements shall not be relied upon and will not be binding or legally effective. Addenda issued by the District as a result of the Site Visit, if any, shall constitute the sole and exclusive record and statement of the results of the Site Visit.

16. Bidders shall submit the Non-Collusion Declaration with their bids. Bids submitted without the Non-Collusion Declaration shall be deemed nonresponsive and will not be considered.

17. The Contractor and all Subcontractors under the Contractor shall pay all workers on all work performed pursuant to the Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the Department of Industrial Relations, are available upon request at the District's principal office. Prevailing wage rates are also available on the internet at http://www.dir.ca.gov.

18. The District has entered into a Project Labor Agreement that is applicable to this Project. A copy of the Project Labor Agreement is available for review at the District Facilities Office and may be downloaded from the District's website, http://www.scusd.edu/pod/project-labor-agreement . The successful bidder and all subcontractors will be required to agree to be bound by the Project Labor Agreement.

19. Pursuant to Education Code section 17550, the District is requiring the Bidder to purchase and to remove from the school grounds all old materials required by the specifications to be removed from any existing school building on the same school grounds and not required for school purposes and to state in his or her bid the amount which he or she will deduct from the price bid for the work as the purchase price of the old materials. The board shall let the contract to any responsible bidder whose net bid is the lowest, or shall reject all bids.

20. Section 17076.11 of the Education Code requires school districts using funds allocated pursuant to the State of California School Facility Program for the construction and/or modernization of school building(s) to have a participation goal for disabled veteran business enterprises ("DVBE") of at least three percent (3%) per year of the overall dollar amount expended on projects that receive state funding or demonstrate its good faith effort to solicit DVBE participation in this Contract. In order to meet this requirement by demonstrating a good faith effort, Bidder must advertise for DVBE-certified subcontractors and suppliers before submitting its Bid. For any project that is at least partially state-funded, the lowest responsive responsible Bidder awarded the Contract must submit certification of compliance with the procedures for implementation of DVBE contracting goals with its signed Agreement. DVBE Certification form is attached. **Do not submit this form with your Bid.**

21. Submission of bid signifies careful examination of Contract Documents and complete understanding of the nature, extent, and location of Work to be performed. Bidders must complete the tasks listed below as a condition to bidding, and submission of a bid shall constitute the Bidder's express representation to District that Bidder has fully completed the following:

    a. Bidder has visited the Site, if required, and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, Site, locality, actual conditions, as-built conditions, and all local conditions and federal, state and local laws, and regulations that in any manner may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto;

    b. Bidder has conducted or obtained and has understood all examinations, investigations, explorations, tests, reports, and studies that pertain to the subsurface conditions, as-built conditions, underground facilities, and all other physical conditions at or contiguous to the Site or otherwise that may affect the cost, progress, performance, or furnishing of Work, as Bidder considers necessary for the performance or furnishing of Work at the Contract Sum, within the Contract Time, and in accordance with the other terms and conditions of Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies, or similar information or data are or will be required by Bidder for such purposes;

    c. Bidder has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents;

d. Bidder has given the District prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and the actual conditions, and the written resolution(s) thereof by the District is/are acceptable to Bidder;

e. Bidder has made a complete disclosure in writing to the District of all facts bearing upon any possible interest, direct or indirect, that Bidder believes any representative of the District or other officer or employee of the District presently has or will have in this Contract or in the performance thereof or in any portion of the profits thereof;

f. Bidder must, prior to bidding, perform the work, investigations, research, and analysis required by this document and that Bidder represented in its Bid Form and Proposal and the Agreement that it performed prior to bidding. Contractor under this Contract is charged with all information and knowledge that a reasonable bidder would ascertain from having performed this required work, investigation, research, and analysis. Bid prices must include entire cost of all work "incidental" to completion of the Work.

g. Conditions Shown on the Contract Documents: Information as to underground conditions, as-built conditions, or other conditions or obstructions, indicated in the Contract Documents, e.g., on Drawings or in Specifications, has been obtained with reasonable care, and has been recorded in good faith. However, District only warrants, and Bidder may only rely, on the accuracy of limited types of information.

   (1) As to above-ground conditions or as-built conditions shown or indicated in the Contract Documents, there is no warranty, express or implied, or any representation express or implied, that such information is correctly shown or indicated. This information is verifiable by independent investigation and Bidder is required to make such verification as a condition to bidding. In submitting its Bid, Bidder shall rely on the results of its own independent investigation. In submitting its Bid, Bidder shall not rely on District-supplied information regarding above-ground conditions or as-built conditions.

   (2) As to any subsurface condition shown or indicated in the Contract Documents, Bidder may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated. District is not responsible for the completeness of such information for bidding or construction; nor is District responsible in any way for any conclusions or opinions that the Bidder has drawn from such information; nor is the District responsible for subsurface conditions that are not specifically shown (for example, District is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown).

h. Conditions Shown in Reports and Drawings Supplied for Informational Purposes: Reference is made to the document entitled Geotechnical Data, and the document entitled Existing Conditions, for identification of:

(1) Subsurface Conditions: Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by Architect in preparing the Contract Documents; and

(2) Physical Conditions: Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that has been utilized by Architect in preparing the Contract Documents.

(3) These reports and drawings are **not** Contract Documents and, except for any "technical" data regarding subsurface conditions specifically identified in Geotechnical Data and Existing Conditions, and underground facilities data, Bidder may not in any manner rely on the information in these reports and drawings. Subject to the foregoing, Bidder must make its own independent investigation of all conditions affecting the Work and must not rely on information provided by District.

22. Bids shall be based on products and systems specified in Contract Documents or listed by name in Addenda. Whenever in the Specifications any materials, process, or article is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be deemed to be followed by the words "or equal." Bidder may, unless otherwise stated, offer any material, process, or article that shall be substantially equal or better in every respect to that so indicated or specified. The District is not responsible and/or liable in any way for a Contractor's damages and/or claims related, in any way, to that Contractor's basing its bid on any requested substitution that the District has not approved in advance and in writing. Contractors and materials suppliers who submit requests for substitutions prior to the award of the Contract must do so in writing and in compliance with Public Contract Code section 3400. All requests must comply with the following:

a. District must receive any notice of request for substitution of a specified item a minimum of **TEN (10)** calendar days prior to bid opening. The Successful Bidder will not be allowed to substitute specified items unless properly noticed.

b. Within 35 days after the date of the Notice of Award, the Successful Bidder shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the Specifications. Insufficient information shall be grounds for rejection of substitution.

c. Approved substitutions, if any, shall be listed in Addenda. District reserves the right not to act upon submittals of substitutions until after bid opening.

d. Substitutions may be requested after Contract has been awarded only if indicated in and in accordance with requirements specified in the Special Conditions and the Specifications.

23. Bidders may examine any available "as-built" drawings of previous work by giving District reasonable advance notice. District will not be responsible for accuracy of "as-built" drawings. The document entitled Existing Conditions applies to all supplied "as-built" drawings.

24. All questions about the meaning or intent of the Contract Documents are to be directed via email to the District to Tina-Alvarez-Bevens@scusd.edu and cc: chris-ralston@scusd.edu and wsjolund@pmgcm.com . Interpretations or clarifications considered necessary by the District in response to such questions will be issued in writing by Addenda and emailed, faxed, mailed, or delivered to all parties recorded by the District as having received the Contract Documents or posted on the District's website at www.scusd.edu . Questions received less than **SEVEN (7)** calendar days prior to the date for opening bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

25. Addenda may also be issued to modify other parts of the Contract Documents as deemed advisable by the District.

26. Each Bidder must acknowledge each Addendum in its Bid Form and Proposal by number or its Bid shall be considered non-responsive. Each Addendum shall be part of the Contract Documents. A complete listing of Addenda may be secured from the District.

27. This Contract may include alternates. Alternates are defined as alternate products, materials, equipment, systems, methods, or major elements of the construction that may, at the District's option and under terms established in the Contract and pursuant to section 20103.8 of the Public Contract Code, be selected for the Work.

28. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder based on the criteria as indicated in the Notice to Bidders. In the event two or more responsible bidders submit identical bids, the District shall select the Bidder to whom to award the Contract by lot.

29. Discrepancies between written words and figures, or words and numerals, will be resolved in favor of figures or numerals.

30. Bidders in contention for contract awards shall be required to attend a Post-Bid interview, which will be set within three (3) calendar days following bid opening. A duly authorized representative of the apparent low bidder is required to attend the Post Bid Interview, in person. The apparent low bidder's authorized representative(s) must have (1) knowledge of how the bid submitted was prepared, (2) the person responsible for supervising performance of the Work, and (3) the authority to bind the apparent low bidder. Failure to attend the Post Bid Interview as scheduled will be considered just cause for the District to reject the Bid as nonresponsive.

31. Any bid protest by any Bidder regarding any other bid must be submitted in writing to the District, before 5:00 p.m. of the **THIRD (3rd)** business day following bid opening.

    a. Only a Bidder who has actually submitted a bid, and who could be awarded the Contract if the bid protest is upheld, is eligible to submit a bid protest.

Subcontractors are not eligible to submit bid protests. A Bidder may not rely on the bid protest submitted by another Bidder.

b. A bid protest must contain a complete statement of any and all bases for the protest and all supporting documentation. Materials submitted after the bid protest deadline will not be considered.

c. The protest must refer to the specific portions of all documents that form the basis for the protest.

(1) Without limitation to any other basis for protest, an inadvertent error in listing the California contractor's license number on the Designated Subcontractors List shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive if the correct contractor's license number is submitted to the District within 24 hours after the bid opening and the corrected number corresponds with the submitted name and location for that subcontractor.

(2) Without limitation to any other basis for protest, an inadvertent error listing an unregistered subcontractor shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive provided that any of the following apply:

(i) The subcontractor is registered prior to the bid opening.

(ii) The subcontractor is registered and has paid the penalty registration fee within 24 hours after the bid opening.

(iii) The subcontractor is replaced by another registered subcontractor pursuant to Public Contract Code section 4107.

d. The protest must include the name, address and telephone number of the person representing the protesting party.

e. The party filing the protest must concurrently transmit a copy of the protest and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest. Such parties shall include all other bidders or proposers who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.

f. The procedure and time limits set forth in this paragraph are mandatory and are each bidder's sole and exclusive remedy in the event of bid protest. Failure to comply with these procedures shall constitute a waiver of any right to further pursue the bid protest, including filing a Government Code Claim or legal proceedings.

32. The Bidder to whom Contract is awarded shall execute and submit the following documents by 5:00 p.m. of the **SEVENTH (7th)** calendar day following the date of the Notice of Award. Failure to properly and timely submit these documents entitles District to reject the bid as nonresponsive.

a. Agreement: To be executed by successful Bidder. Submit two (2) copies, each bearing an original signature.

b. Escrow of Bid Documentation: This must include all required documentation. See the document titled Escrow Bid Documentation for more information.

c. Performance Bond (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.

d. Payment Bond (Contractor's Labor and Material Bond) (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.

e. Insurance Certificates and Endorsements as required.

f. Workers' Compensation Certification.

g. Prevailing Wage and Related Labor Requirements Certification.

h. Disabled Veteran Business Enterprise Participation Certification.

i. Drug-Free Workplace Certification.

j. Tobacco-Free Environment Certification.

k. Hazardous Materials Certification.

l. Lead-Based Materials Certification.

m. Imported Materials Certification.

n. Criminal Background Investigation/Fingerprinting Certification.

o. Registered Subcontractors List: Must include Department of Industrial Relations (DIR) registration number of each subcontractor for all tiers.

33. Time for Completion: District may issue a Notice to Proceed within **NINETY (90)** days from the date of the Notice of Award. Once Contractor has received the Notice to Proceed, Contractor shall complete the Work within the period of time indicated in the Contract Documents.

a. In the event that the District desires to postpone issuing the Notice to Proceed beyond this 90-day period, it is expressly understood that with reasonable notice to the Contractor, the District may postpone issuing the Notice to Proceed.

b. It is further expressly understood by Contractor that Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of the issuance of the Notice to Proceed beyond a 90-day period. If the Contractor believes that a postponement of issuance of the Notice to Proceed will cause a hardship to the Contractor, the Contractor may terminate the Contract. Contractor's termination due to a postponement beyond this 90-day period shall be by written notice to District within **TEN**

(10) calendar days after receipt by Contractor of District's notice of postponement.

c. It is further understood by the Contractor that in the event that Contractor terminates the Contract as a result of postponement by the District, the District shall only be obligated to pay Contractor for the Work that Contractor had performed at the time of notification of postponement and which the District had in writing authorized Contractor to perform prior to issuing a Notice to Proceed.

d. Should the Contractor terminate the Contract as a result of a notice of postponement, District shall have the authority to award the Contract to the next lowest responsive responsible bidder.

34. District reserves the right to reject any or all bids, including without limitation the right to reject any or all nonconforming, nonresponsive, unbalanced, or conditional bids, to re-bid, and to reject the bid of any bidder if District believes that it would not be in the best interest of the District to make an award to that bidder, whether because the bid is not responsive or the bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by District. District also reserves the right to waive any inconsequential deviations or irregularities in any bid. For purposes of this paragraph, an "unbalanced bid" is one having nominal prices for some work items and/or enhanced prices for other work items.

35. It is the policy of the District that no qualified person shall be excluded from participating in, be denied the benefits of, or otherwise be subjected to discrimination in any consideration leading to the award of contract, based on race, color, gender, sexual orientation, political affiliation, age, ancestry, religion, marital status, national origin, medical condition or disability. The Successful Bidder and its subcontractors shall comply with applicable federal and state laws, including, but not limited to the California Fair Employment and Housing Act, beginning with Government Code section 12900, and Labor Code section 1735.

36. Prior to the award of Contract, District reserves the right to consider the responsibility of the Bidder. District may conduct investigations as District deems necessary to assist in the evaluation of any bid and to establish the responsibility, including, without limitation, qualifications and financial ability of Bidders, proposed subcontractors, suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to District's satisfaction within the prescribed time.

37. Bidder expressly acknowledges that it is familiar with and capable of complying with applicable federal, State, and local requirements relating to COVID-19 or other public health emergency/epidemic/pandemic including, if required, preparing, posting, and implementing a Social Distancing Protocol, and such costs shall be included in the bid as an allowance. Any unused portion of the allowance designated for COVID-19 or other public health emergency/epidemic/pandemic compliance will revert back to the District documented by a deductive change order.

END OF DOCUMENT

DOCUMENT 00 21 13.1

BIDDER INFORMATION AND FORMS

[INTENTIONALLY LEFT BLANK UNLESS PROVIDED IN SPECIAL CONDITIONS – SEPARATE PREQUALIFICATION PROCESS RECOMMENDED]

END OF DOCUMENT

DOCUMENT 00 31 19

EXISTING CONDITIONS

38. Summary

This document describes existing conditions at or near the Project, and use of information available regarding existing conditions. This document is **not** part of the Contract Documents. See General Conditions for definition(s) of terms used herein.

39. Reports and Information on Existing Conditions

a. Documents providing a general description of the Site and conditions of the Work may have been collected by the Sacramento City Unified School District ("District"), its consultants, contractors, and tenants. These documents may, but are not required to, include previous contracts, contract specifications, tenant improvement contracts, as-built drawings, utility drawings, and information regarding underground facilities.

b. Information regarding existing conditions may be inspected at the District offices or the Construction Manager's offices, if any, and copies may be obtained at cost of reproduction and handling upon Bidder's agreement to pay for such copies. These reports, documents, and other information are **not** part of the Contract Documents. These reports, documents, and other information do **not** excuse Contractor from fulfilling Contractor's obligation to independently investigate any or all existing conditions or from using reasonable prudent measures to avoid damaging existing improvements.

c. Information regarding existing conditions may also be included in the Project Manual, but shall **not** be considered part of the Contract Documents.

d. Prior to commencing this Work, Contractor and the District's representative shall survey the Site to document the condition of the Site. Contractor will record the survey in digital videotape format and provide an electronic copy to the District within fourteen (14) days of the survey.

e. Contractor may also document any pre-existing conditions in writing, provided that both the Contractor and the District's representative agree on said conditions and sign a memorandum documenting the same.

f. The reports and other data or information regarding existing conditions and underground facilities at or contiguous to the Project are the following:

(1) Original Construction Drawings.
(2) Survey of Site.
(3) Geotechnical Report(s).
(4) Hazardous Material Report(s).

40. Use of Information

a. Information regarding existing conditions was obtained only for use of District and its consultants, contractors, and tenants for planning and design and is **not** part of the Contract Documents.

b. District does not warrant, and makes no representation regarding, the accuracy or thoroughness of any information regarding existing conditions. Bidder represents and agrees that in submitting a bid it is not relying on any information regarding existing conditions supplied by District.

c. Under no circumstances shall District be deemed to warrant or represent existing above-ground conditions, as-built conditions, or other actual conditions, verifiable by independent investigation. These conditions are verifiable by Bidder by the performance of its own independent investigation that Bidder must perform as a condition to bidding and Bidder should not and shall not rely on this information or any other information supplied by District regarding existing conditions.

d. Any information shown or indicated in the reports and other data supplied herein with respect to existing underground facilities at or contiguous to the Project may be based upon information and data furnished to District by the District's employees and/or consultants or builders of such underground facilities or others. District does not assume responsibility for the completeness of this information, and Bidder is solely responsible for any interpretation or conclusion drawn from this information.

e. District shall be responsible only for the general accuracy of information regarding underground facilities, and only for those underground facilities that are owned by District, and only where Bidder has conducted the independent investigation required of it pursuant to the Instructions to Bidders, and discrepancies are not apparent.

41. Investigations/Site Examinations

a. Before submitting a bid, each Bidder is responsible for conducting or obtaining any additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site or otherwise, that may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or that Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of Contract Documents.

b. On request, District will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a bid. Bidders must fill all holes and clean up and restore the Site to its former condition upon completion of its explorations, investigations, tests, and studies. Such investigations and Site examinations may be performed during any and all Site visits indicated in the Notice to Bidders and only under the provisions of the Contract

Documents, including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such work, and District's prior approval.

END OF DOCUMENT

DOCUMENT 00 31 32

GEOTECHNICAL DATA

42. Summary

This document describes geotechnical data at or near the Project that is in the District's possession available for Contractor's review, and use of data resulting from various investigations. This document is **not** part of the Contract Documents. See General Conditions for definition(s) of terms used herein.

43. Geotechnical Reports

a. Geotechnical reports may have been prepared for and around the Site and/or in connection with the Work by soil investigation engineers hired by Sacramento City Unified School District ("District"), and its consultants, contractors, and tenants.

b. Geotechnical reports may be inspected at the District offices or the Construction Manager's offices, if any, and copies may be obtained at cost of reproduction and handling upon Bidder's agreement to pay for such copies. These reports are **not** part of the Contract Documents.

c. The reports and drawings of physical conditions that may relate to the Project are the following:

NONE

44. Use of Data

a. Geotechnical data were obtained only for use of District and its consultants, contractors, and tenants for planning and design and are **not** a part of Contract Documents.

b. Except as expressly set forth below, District does not warrant, and makes no representation regarding, the accuracy or thoroughness of any geotechnical data. Bidder represents and agrees that in submitting a bid it is not relying on any geotechnical data supplied by District, except as specifically allowed below.

c. Under no circumstances shall District be deemed to make a warranty or representation of existing above ground conditions, as-built conditions, geotechnical conditions, or other actual conditions verifiable by independent investigation. These conditions are verifiable by Bidder by the performance of its own independent investigation that Bidder should perform as a condition to bidding and Bidder must not and shall not rely on information supplied by District.

45. Limited Reliance Permitted on Certain Information

a. Reference is made herein for identification of:

Reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by District in preparation of the Contract Documents.

Drawings of physical conditions in or relating to existing subsurface structures (except underground facilities) that are at or contiguous to the Site and have been utilized by District in preparation of the Contract Documents.

b. Bidder may rely upon the general accuracy of the "technical data" contained in the reports and drawings identified above, but only insofar as it relates to subsurface conditions, provided Bidder has conducted the independent investigation required pursuant to Instructions to Bidders, and discrepancies are not apparent. The term "technical data" in the referenced reports and drawings shall be limited as follows:

(1) The term "technical data" shall include actual reported depths, reported quantities, reported soil types, reported soil conditions, and reported material, equipment or structures that were encountered during subsurface exploration. The term "technical data" does not include, and Bidder may not rely upon, any other data, interpretations, opinions or information shown or indicated in such drawings or reports that otherwise relate to subsurface conditions or described structures.

(2) The term "technical data" shall not include the location of underground facilities.

(3) Bidder may not rely on the completeness of reports and drawings for the purposes of bidding or construction. Bidder may rely upon the general accuracy of the "technical data" contained in such reports or drawings.

(4) Bidder is solely responsible for any interpretation or conclusion drawn from any "technical data" or any other data, interpretations, opinions, or information provided in the identified reports and drawings.

46. Investigations/Site Examinations

a. Before submitting a bid, each Bidder is responsible for conducting or obtaining any additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site or otherwise, that may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or that Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of Contract Documents.

b. On request, District will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a bid. Bidders must fill all holes and clean up and restore the Site to its former condition upon completion of its explorations, investigations, tests, and studies. Such investigations and Site examinations may be performed during any and all Site visits indicated in the Notice to Bidders and only under the provisions of the Contract Documents, including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such work, and District's prior approval.

END OF DOCUMENT

DOCUMENT 00 41 13

BID FORM AND PROPOSAL

To: Governing Board of the Sacramento City Unified School District ("District" or "Owner")

From: _____
(Proper Name of Bidder)

The undersigned declares that Bidder has read and understands the Contract Documents, including, without limitation, the Notice to Bidders and the Instructions to Bidders, and agrees and proposes to furnish all necessary labor, materials, and equipment to perform and furnish all work in accordance with the terms and conditions of the Contract Documents, including, without limitation, the Drawings and Specifications of **Bid No.0530-434**, for the following project known as:

Luther Burbank High School Core Academic Renovation Phase #2

("Project" or "Contract") and will accept in full payment for that Work the following total lump sum amount, all taxes included:

_____	dollars	$ _____
BASE BID		
Three Hundred Seventy-Five Thousand Dollars	dollars	$ 375,000
OWNERS ALLOWANCE		
_____	dollars	$ _____
TOTAL BASE BID		

Bidder acknowledges and agrees that the Base Bid accounts for any and all Allowance(s), Total Cost for Unit Prices, and OCIP excluded costs.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

Additional Detail Regarding Calculation of Base Bid

1. **Allowance**. The Bidder's Base Bid shall include **$375,000** allowance for Unforeseen Conditions

2. The undersigned has reviewed the Work outlined in the Contract Documents and fully understands the scope of Work required in this Proposal, understands the construction and project management function(s) is described in the Contract Documents, and that each Bidder who is awarded a contract shall be in fact a prime contractor, not a subcontractor, to the District, and agrees that its Proposal, if accepted by the District, will be the basis for the Bidder to enter into a contract with the District in accordance with the intent of the Contract Documents.

3. The undersigned has notified the District in writing of any discrepancies or omissions or of any doubt, questions, or ambiguities about the meaning of any of the Contract Documents, and has contacted the Construction Manager before bid date to verify the issuance of any clarifying Addenda.

4. The undersigned agrees to commence work under this Contract on the date established in the Contract Documents and to complete all work within the time specified in the Contract Documents.

5. The liquidated damages clause of the General Conditions and Agreement is hereby acknowledged.

6. It is understood that the District reserves the right to reject this bid and that the bid shall remain open to acceptance and is irrevocable for a period of ninety (90) days.

7. The following documents are attached hereto:

   - Bid Bond on the District's form or other security
   - Designated Subcontractors List
   - Site Visit Certification
   - Non-Collusion Declaration
   - Iran Contracting Act Certification

8. Receipt and acceptance of the following Addenda is hereby acknowledged:

No. _____, Dated _____	No. _____, Dated _____
No. _____, Dated _____	No. _____, Dated _____
No. _____, Dated _____	No. _____, Dated _____

9. Bidder acknowledges that the license required for performance of the Work is a **Contractors B license**.

10. Bidder hereby certifies that Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.

11. Bidder specifically acknowledges and understands that if it is awarded the Contract, that it shall perform the Work of the Project while complying with all requirements of the Department of Industrial Relations.

12. Bidder hereby certifies that its bid includes sufficient funds to permit Bidder to comply with all local, state or federal labor laws or regulations during the Project, including payment of prevailing wage, and that Bidder will comply with the provisions of Labor Code section 2810(d) if awarded the Contract

13. [Bidder agrees to comply with all requirements of the Project Labor Agreement].

14. Bidder specifically acknowledges and understands that if it is awarded the Contract, that it shall perform the Work of the Project while complying with the Davis Bacon Act, applicable reporting requirements, and any and all other applicable requirements for federal funding. If a conflict exists, the more stringent requirement shall control.

15. Bidder represents that it is competent, knowledgeable, and has special skills with respect to the nature, extent, and inherent conditions of the Work to be performed. Bidder further acknowledges that there are certain peculiar and inherent conditions existent in the construction of the Work that may create, during the Work, unusual or peculiar unsafe conditions hazardous to persons and property.

16. Bidder expressly acknowledges that it is aware of such peculiar risks and that it has the skill and experience to foresee and to adopt protective measures to adequately and safely perform the Work with respect to such hazards.

17. Bidder expressly acknowledges that it is familiar with and capable of complying with applicable federal, State, and local requirements relating to COVID-19 or other public health emergency/epidemic/pandemic including, if required, preparing, posting, and implementing a Social Distancing Protocol.

18. Bidder expressly acknowledges that it is aware that if a false claim is knowingly submitted (as the terms "claim" and "knowingly" are defined in the California False Claims Act, Gov. Code, § 12650 et seq.), the District will be entitled to civil remedies set forth in the California False Claim Act. It may also be considered fraud and the Contractor may be subject to criminal prosecution.

19. The undersigned Bidder certifies that it is, at the time of bidding, and shall be throughout the period of the Contract, licensed by the State of California to do the type of work required under the terms of the Contract Documents and registered as a public works contractor with the Department of Industrial Relations. Bidder further certifies that it is regularly engaged in the general class and type of work called for in the Contract Documents.

Furthermore, Bidder hereby certifies to the District that all representations, certifications, and statements made by Bidder, as set forth in this bid form, are true and correct and are made under penalty of perjury.

Dated this _____ day of _____ 20 ____

Name of Bidder: _____

Type of Organization: _____

Signature: _____

Print Name: _____

Title: _____

Address of Bidder: _____

Taxpayer Identification No. of Bidder: _____

Telephone Number: _____

Fax Number: _____

E-mail: _____ Web Page: _____

Contractor's License No(s): No.: _____ Class: _____ Expiration Date: _____

No.: _____ Class:_____ Expiration Date: _____

No.: _____ Class:_____ Expiration Date: _____

Public Works Contractor Registration No.: _____

END OF DOCUMENT

DOCUMENT 00 43 13

BID BOND

(Note: If Bidder is providing a bid bond as its bid security, Bidder must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

That the undersigned,_____, as Principal ("Principal"),

and _____, as Surety ("Surety"), a corporation organized and existing under and by virtue of the laws of the State of California and authorized to do business as a surety in the State of California, are held and firmly bound unto the Sacramento City Unified School District ("District") of Sacramento County, State of California, as Obligee, in an amount equal to ten percent (10%) of the Base Bid plus alternates, in the sum of

_____ Dollars ($ _____)

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

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted a bid to the District for all Work specifically described in the accompanying bid for the following project: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** ("Project" or "Contract").

NOW, THEREFORE, if the Principal is awarded the Contract and, within the time and manner required under the Contract Documents, after the prescribed forms are presented to Principal for signature, enters into a written contract, in the prescribed form in accordance with the bid, and files two bonds, one guaranteeing faithful performance and the other guaranteeing payment for labor and materials as required by law, and meets all other conditions to the Contract between the Principal and the Obligee becoming effective, or if the Principal shall fully reimburse and save harmless the Obligee from any damage sustained by the Obligee through failure of the Principal to enter into the written contract and to file the required performance and labor and material bonds, and to meet all other conditions to the Contract between the Principal and the Obligee becoming effective, then this obligation shall be null and void; otherwise, it shall be and remain in full force and effect. The full payment of the sum stated above shall be due immediately if Principal fails to execute the Contract within seven (7) days of the date of the District's Notice of Award to Principal.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or the call for bids, or to the work to be performed thereunder, or the specifications accompanying the same, shall in any way affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or the call for bids, or to the work, or to the specifications.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorneys' fee to be fixed by the Court.

If the District awards the bid, the security of unsuccessful bidder(s) shall be returned within sixty (60) days from the time the award is made. Unless otherwise required by law, no bidder may withdraw its bid for ninety (90) days after the date of the bid opening.

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

_____
Principal

_____
By

_____
Surety

_____
By

_____
Name of California Agent of Surety

_____
Address of California Agent of Surety

_____
Telephone Number of California Agent of Surety

Bidder must attach Power of Attorney and Certificate of Authority for Surety and a Notarial Acknowledgment for all Surety's signatures. The California Department of Insurance must authorize the Surety to be an admitted Surety Insurer.

END OF DOCUMENT

DOCUMENT 00 43 36

DESIGNATED SUBCONTRACTORS LIST
(Public Contact Code Sections 4100-4114)

PROJECT: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434**

Bidder acknowledges and agrees that it must clearly set forth below the name, location and California contractor license number of each subcontractor who will perform work or labor or render service to the Bidder in or about the construction of the Work or who will specially fabricate and install a portion of the Work according to detailed drawings contained in the plans and specifications in an amount in excess of one-half of one percent (0.5%) of Bidder's total Base Bid and the kind of Work that each will perform. Vendors or suppliers of materials only do not need to be listed.

Bidder acknowledges and agrees that, if Bidder fails to list as to any portion of Work, or if Bidder lists more than one subcontractor to perform the same portion of Work, Bidder must perform that portion itself or be subjected to penalty under applicable law. In case more than one subcontractor is named for the same kind of Work, state the portion of the kind of Work that each subcontractor will perform.

If alternate bid(s) is/are called for and Bidder intends to use subcontractors different from or in addition to those subcontractors listed for work under the Base Bid, Bidder must list subcontractors that will perform Work in an amount in excess of one half of one percent (0.5%) of Bidder's total Base Bid plus alternate(s).

If further space is required for the list of proposed subcontractors, attach additional copies of page 2 showing the required information, as indicated below.

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

DIR Registration #: _____

Portion of Work: ______________________________

Subcontractor Name: ______________________________

CA Cont. Lic. #: ______________________ Location: ______________

DIR Registration #: ______________________________

Portion of Work: ______________________________

Subcontractor Name: ______________________________

CA Cont. Lic. #: ______________________ Location: ______________

DIR Registration #: ______________________________

Portion of Work: ______________________________

Subcontractor Name: ______________________________

CA Cont. Lic. #: ______________________ Location: ______________

DIR Registration #: ______________________________

Portion of Work: ______________________________

Subcontractor Name: ______________________________

CA Cont. Lic. #: ______________________ Location: ______________

DIR Registration #: ______________________________

Portion of Work: ______________________________

Subcontractor Name: ______________________________

CA Cont. Lic. #: ______________________ Location: ______________

DIR Registration #: ______________________________

Portion of Work: ______________________________

Date: ______________________________

Proper Name of Bidder: ______________________________

Signature: ______________________________

Print Name: ______________________________

Title: ______________________________

END OF DOCUMENT

DOCUMENT 00 45 01

SITE VISIT CERTIFICATION

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID
IF SITE VISIT WAS MANDATORY

PROJECT: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434**

Check option that applies:

_____ I certify that I visited the Site of the proposed Work, received the attached _____ pages of information, and became fully acquainted with the conditions relating to construction and labor. I fully understand the facilities, difficulties, and restrictions attending the execution of the Work under contract.

_____ I certify that _____ (Bidder's representative) visited the Site of the proposed Work, received the attached _____ pages of information, and became fully acquainted with the conditions relating to construction and labor. The Bidder's representative fully understood the facilities, difficulties, and restrictions attending the execution of the Work under contract.

Bidder fully indemnifies the Sacramento City Unified School District, its Architect, its Engineers, its Construction Manager, and all of their respective officers, agents, employees, and consultants from any damage, or omissions, related to conditions that could have been identified during my visit and/or the Bidder's representative's visit to the Site.

I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

ATTACHMENTS:

1.

2.

3.

END OF DOCUMENT

DOCUMENT 00 45 19

NON-COLLUSION DECLARATION
(Public Contract Code Section 7106)

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.
[Title] [Name of Firm]

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. 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 of that of any other bidder. All statements contained in the bid are true. 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, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____,
[Date]

at _____, _____.
[City] [State]

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 19.01

IRAN CONTRACTING ACT CERTIFICATION
(Public Contract Code Sections 2202-2208)

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

Prior to bidding on or submitting a proposal for a contract for goods or services of $1,000,000 or more, the bidder/proposer must submit this certification pursuant to Public Contract Code section 2204.

The bidder/proposer must complete **ONLY ONE** of the following two options. To complete OPTION 1, check the corresponding box **and** complete the certification below. To complete OPTION 2, check the corresponding box, complete the certification below, and attach documentation demonstrating the exemption approval.

☐ **OPTION 1.** Bidder/Proposer is not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code section 2203(b), and we are not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

☐ **OPTION 2.** Bidder/Proposer has received a written exemption from the certification requirement pursuant to Public Contract Code sections 2203(c) and (d). *A copy of the written documentation demonstrating the exemption approval is included with our bid/proposal.*

CERTIFICATION:

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY, that I am duly authorized to legally bind the bidder/proposer to the OPTION selected above. This certification is made under the laws of the State of California.

Vendor Name/Financial Institution (Printed)	*Federal ID Number (or n/a)*
By (Authorized Signature)	
Printed Name and Title of Person Signing	*Date Executed*

END OF DOCUMENT

DOCUMENT 00 45 26

WORKERS' COMPENSATION CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

Labor Code section 3700, in relevant part, provides:

> 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 by one or more insurers duly authorized to write compensation insurance in this state; and/or
>
> 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 workers' 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.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

(In accordance with Labor Code sections 1860 and 1861, the above certificate must be signed and filed with the awarding body prior to performing any Work under this Contract.)

END OF DOCUMENT

DOCUMENT 00 45 46.01

PREVAILING WAGE AND RELATED LABOR REQUIREMENTS CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

I hereby certify that I will conform to the State of California Public Works Contract requirements regarding prevailing wages, benefits, on-site audits with 48-hours' notice, payroll records, and apprentice and trainee employment requirements, for all Work on the above Project including, without limitation, labor compliance monitoring and enforcement by the Department of Industrial Relations.

I hereby certify that I will also conform to the Federal Labor Standards Provisions regarding minimum wages, withholding, payrolls and basic records, apprentice and trainee employment requirements, equal employment opportunity requirements, Copeland Act requirements, Davis-Bacon and Related Act requirements, Contract Work Hours and Safety Standards Act requirements, and any and all other applicable requirements for federal funding for all Work on the above Project.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.02

DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, # 0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

GENERAL INSTRUCTIONS

Section 17076.11 of the Education Code requires school districts using, or planning to use, funds allocated pursuant to the State of California School Facility Program ("Program") for the construction and/or modernization of school buildings to have a participation goal for disabled veteran business enterprises ("DVBE") of at least three percent (3%) per year of the overall dollar amount expended each year by the school district on projects that receive state funding. Therefore, the lowest responsive responsible Bidder awarded the Contract must submit this document to the District with its executed Agreement, identifying the steps contractor took to solicit DVBE participation in conjunction with this Contract. **Do not submit this form with your bids.**

PART I – Method of Compliance with DVBE Participation Goals. Check the appropriate box to indicate your method of committing the contract dollar amount.

YOUR BUSINESS ENTERPRISE IS:	AND YOU WILL	AND YOU WILL
1.01 ☐ Disabled veteran owned and your forces will perform at least 3% of this Contract	Include a copy of your DVBE letter from Office of Small Business and Disabled Veterans Business Enterprise Services ("OSDS")*	Complete Part 1 of this form and the Certification
1.02 ☐ Disabled veteran owned but is unable to perform 3% of this Contract with your forces	Use DVBE subcontractors /suppliers to bring the Contract participation to at least 3%	Include a copy of each DVBE's letter from OSDS (including yours, if applicable), and complete Part 1 of this form and the Certification
1.03 ☐ NOT disabled veteran owned	Use DVBE subcontractors /suppliers for at least 3% of this Contract	
1.04 ☐ Unable to meet the required participation goals after good faith efforts	Make good faith efforts, including contacts, advertisement and DVBE solicitation	Complete all of this form and the Certification

* A DVBE letter from OSDS is obtained from the participating DVBE.

You must complete the following table to show the dollar amount of DVBE participation:

	TOTAL CONTRACT PRICE
1.01 Prime Bidder, if DVBE (own participation)	$
1.02 DVBE Subcontractor or Supplier	
A.	
B.	
C.	
D.	
1.03 Subtotal (A & B)	
1.04 Non-DVBE	
1.05 Total Bid	

PART II – Contacts. To identify DVBE subcontractors/suppliers for participation in your contract, you must contact each of the following categories. You should contact several DVBE organizations.

CATEGORY	TELEPHONE NUMBER	DATE CONTACTED	PERSON CONTACTED
A. The District, if any			*
B. OSDS, provides assistance locating DVBEs at https://caleprocure.ca.gov/pages/PublicSearch/supplier-search.aspx	(916) 375-4940		*
C. DVBE Organization (List)			*

*Write "recorded message" in this column, if applicable.

PART III – Advertisement. You must advertise for DVBE participation in both a trade and focus paper. List the advertisement you place to solicit DVBE participation. Advertisements should be published at least fourteen (14) days prior to bid/proposal opening; if you cannot advertise fourteen (14) days prior, advertisements should be published as soon as possible. Advertisements must include that your firm is seeking DVBE participation, the project name and location, and your firm's name, your contact person, and telephone number. Attach copies of advertisements to this form.

FOCUS/TRADE PAPER NAME	**CHECK ONE**		**DATE OF ADVERTISEMENT**
	TRADE	**FOCUS**	

PART IV – DVBE Solicitations. List DVBE subcontractors/suppliers that were invited to bid. Use the following instructions to complete the remainder of this section (read the three columns as a sentence from left to right). If you need additional space to list DVBE solicitations, please use a separate page and attach to this form.

IF THE DVBE…..	**THEN…..**	**AND…..**
was selected to participate	Check "YES" in the "SELECTED" column	include a copy of their DVBE letter(s) from OSDS
was **NOT** selected to participate	Check "NO" in the "SELECTED" column	state why in the "REASON NOT SELECTED" column
did not respond to your solicitation	Check the "NO RESPONSE" column.	

DVBE CONTACTED	**SELECTED**		**REASON NOT SELECTED**	**NO RESPONSE**
	YES	**NO**		

A copy of this form must be retained by you and may be subject to a future audit.

CERTIFICATION

I, _____, certify that I am the bidder's _____ and that I have made a diligent effort to ascertain the facts with regard to the representations made herein. In making this certification, I am aware of section 12650 et seq. of the Government Code providing for the imposition of treble damages for making false claims.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.03

DRUG-FREE WORKPLACE CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

This Drug-Free Workplace Certification form is required from the successful Bidder pursuant to Government Code section 8350 et seq., the Drug-Free Workplace Act of 1990. The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for the procurement of any property or service from any state agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each contract or grant awarded by a state agency may be subject to suspension of payments or termination of the contract or grant, and the contractor or grantee may be subject to debarment from future contracting, if the contracting agency determines that specified acts have occurred.

The District is not a "state agency" as defined in the applicable section(s) of the Government Code, but the District is a local agency and public school district under California law and requires all contractors on District projects to comply with the provisions and requirements of the Drug-Free Workplace Act of 1990.

Contractor must also comply with the provisions of Health & Safety Code section 11362.3 which prohibits the consumption or possession of cannabis or cannabis products in any public place, including school grounds, and specifically on school grounds while children are present.

Contractor shall certify that it will provide a drug-free workplace by doing all of the following:

c. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in the person's or organization's workplace and specifying actions which will be taken against employees for violations of the prohibition.

d. Establishing a drug-free awareness program to inform employees about all of the following:

(1) The dangers of drug abuse in the workplace.

(2) The person's or organization's policy of maintaining a drug-free workplace.

(3) The availability of drug counseling, rehabilitation, and employee-assistance programs.

(4) The penalties that may be imposed upon employees for drug abuse violations.

e. Requiring that each employee engaged in the performance of the contract or grant be given a copy of the statement required above, and that, as a condition of employment on the contract or grant, the employee agrees to abide by the terms of the statement.

I, the undersigned, agree to fulfill the terms and requirements of Government Code section 8355 listed above and will publish a statement notifying employees concerning (a) the prohibition of controlled substance at the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the Contract be given a copy of the statement required by section 8355(a), and requiring that the employee agree to abide by the terms of that statement.

I also understand that if the District determines that I have either (a) made a false certification herein, or (b) violated this certification by failing to carry out the requirements of section 8355, that the Contract awarded herein is subject to termination, suspension of payments, or both. I further understand that, should I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of the aforementioned Act.

I acknowledge that I am aware of the provisions of and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990 and Health and Safety Code section 11362.3.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.04

TOBACCO-FREE ENVIRONMENT CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

This Tobacco-Free Environment Certification form is required from the successful Bidder.

Pursuant to, without limitation, 20 U.S.C. section 6083, Labor Code section 6400 et seq., Health & Safety Code section 104350 et seq., Business and Professions Code section 22950 et seq., and District Board policies, all District sites, including the Project site, are tobacco-free environments. Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. The prohibition on smoking includes the use of any electronic smoking device that creates an aerosol or vapor, in any manner or in any form, and the use of any oral smoking device for the purpose of circumventing the prohibition of tobacco smoking. Further, Health & Safety Code section 11362.3 prohibits the smoking or use of cannabis or cannabis products in any place where smoking tobacco is prohibited.

I acknowledge that I am aware of the District's policy regarding tobacco-free environments at District sites, including the Project site and hereby certify that I will adhere to the requirements of that policy and not permit any of my firm's employees, agents, subcontractors, or my firm's subcontractors' employees or agents, to use tobacco and/or smoke on the Project site.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.05

HAZARDOUS MATERIALS CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

20. Contractor hereby certifies that no asbestos, or asbestos-containing materials, polychlorinated biphenyl (PCB), or any material listed by the federal or state Environmental Protection Agency or federal or state health agencies as a hazardous material, or any other material defined as being hazardous under federal or state laws, rules, or regulations, ("New Hazardous Material"), shall be furnished, installed, or incorporated in any way into the Project or in any tools, devices, clothing, or equipment used to affect any portion of Contractor's work on the Project for District.

21. Contractor further certifies that it has instructed its employees with respect to the above-mentioned standards, hazards, risks, and liabilities.

22. Asbestos and/or asbestos-containing material shall be defined as all items containing but not limited to chrysotile, crocidolite, amosite, anthophyllite, tremolite, and actinolite. Any or all material containing greater than one-tenth of one percent (0.1%) asbestos shall be defined as asbestos-containing material.

23. Any disputes involving the question of whether or not material is New Hazardous Material shall be settled by electron microscopy or other appropriate and recognized testing procedure, at the District's determination. The costs of any such tests shall be paid by Contractor if the material is found to be New Hazardous Material.

24. All Work or materials found to be New Hazardous Material or Work or material installed with equipment containing New Hazardous Material will be immediately rejected and this Work will be removed at Contractor's expense at no additional cost to the District.

25. Contractor has read and understood the document titled Hazardous Materials Procedures & Requirements, and shall comply with all the provisions outlined therein. Contractor certifies that it is knowledgeable of, and shall comply with, all laws applicable to the Work including, but not limited to, all federal, state, and local laws, statutes, standards, rules, regulations, and ordinances applicable to the Work.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.06

LEAD-BASED MATERIALS CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

This certification provides notice to the Contractor that:

(1) Contractor's work may disturb lead-containing building materials.

(2) Contractor shall notify the District if any work may result in the disturbance of lead-containing building materials.

(3) Contractor shall comply with the Renovation, Repair and Painting Rule, if lead-based paint is disturbed in a six-square-foot or greater area indoors or a 20-square-foot or greater area outdoors.

1. Lead as a Health Hazard

Lead poisoning is recognized as a serious environmental health hazard facing children today. Even at low levels of exposure, much lower than previously believed, lead can impair the development of a child's central nervous system, causing learning disabilities, and leading to serious behavioral problems. Lead enters the environment as tiny lead particles and lead dust disburses when paint chips, chalks, peels, wears away over time, or is otherwise disturbed. Ingestion of lead dust is the most common pathway of childhood poisoning; lead dust gets on a child's hands and toys and then into a child's mouth through common hand-to-mouth activity. Exposures may result from construction or remodeling activities that disturb lead paint, from ordinary wear and tear of windows and doors, or from friction on other surfaces.

Ordinary construction and renovation or repainting activities carried out without lead-safe work practices can disturb lead-based paint and create significant hazards. Improper removal practices, such as dry scraping, sanding, or water blasting painted surfaces, are likely to generate high volumes of lead dust.

Because the Contractor and its employees will be providing services for the District, and because the Contractor's work may disturb lead-containing building materials, CONTRACTOR IS HEREBY NOTIFIED of the potential presence of lead-containing materials located within certain buildings utilized by the District. All school buildings built prior to 1978 are presumed to contain some lead-based paint until sampling proves otherwise.

2. Overview of California Law

Education Code section 32240 et seq. is known as the Lead-Safe Schools Protection Act. Under this act, the Department of Health Services is to conduct a sample survey of schools in the State of California for the purpose of developing risk factors to predict lead contamination in public schools. (Ed. Code, § 32241.)

Any school that undertakes any action to abate existing risk factors for lead is required to utilize trained and state-certified contractors, inspectors, and workers. (Ed. Code, § 32243, subd. (b).) Moreover, lead-based paint, lead plumbing, and solders, or other potential sources of lead contamination, shall not be utilized in the construction of any new school facility or the modernization or renovation of any existing school facility. (Ed. Code, § 32244.)

Both the Federal Occupational Safety and Health Administration ("Fed/OSHA") and the California Division of Occupational Safety and Health ("Cal/OSHA") have implemented safety orders applicable to all construction work where a contractor's employee may be occupationally exposed to lead.

The OSHA Regulations apply to all construction work where a contractor's employee may be occupationally exposed to lead. The OSHA Regulations contain specific and detailed requirements imposed on contractors subject to those regulations. The OSHA Regulations define construction work as work for construction, alteration, and/or repair, including painting and decorating. Regulated work includes, but is not limited to, the following:

a. Demolition or salvage of structures where lead or materials containing lead are present;

b. Removal or encapsulation of materials containing lead;

c. New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead;

d. Installation of products containing lead;

e. Lead contamination/emergency cleanup;

f. Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed; and

g. Maintenance operations associated with the construction activities described in the subsection.

Because it is assumed by the District that all painted surfaces (interior as well as exterior) within the District contain some level of lead, it is imperative that the Contractor, its workers and subcontractors fully and adequately comply with all applicable laws, rules and regulations governing lead-based materials (including title 8, California Code of Regulations, section 1532.1).

Contractor shall notify the District if any Work may result in the disturbance of lead-containing building materials. Any and all Work that may result in the disturbance of lead-containing building materials shall be coordinated through the District. A signed copy of this Certification shall be on file prior to beginning Work on the Project, along with all current insurance certificates.

3. Renovation, Repair and Painting Rule, Section 402(c)(3) of the Toxic Substances Control Act

The EPA requires lead safe work practices to reduce exposure to lead hazards created by renovation, repair and painting activities that disturb lead-based paint. Pursuant to the Renovation, Repair and Painting Rule (RRP), renovations in homes, childcare facilities, and schools built prior to 1978 must be conducted by certified renovations firms, using renovators with training by a EPA-accredited training provider, and fully and adequately complying with all applicable laws, rules and regulations governing lead-based materials, including those rules and regulations appearing within title 40 of the Code of Federal Regulations as part 745 (40 CFR 745).

The RRP requirements apply to all contractors who disturb lead-based paint in a six-square-foot or greater area indoors or a 20-square-foot or greater area outdoors. If a DPH-certified inspector or risk assessor determines that a home constructed before 1978 is lead-free, the federal certification is not required for anyone working on that particular building.

4. Contractor's Liability

If the Contractor fails to comply with any applicable laws, rules, or regulations, and that failure results in a site or worker contamination, the Contractor will be held solely responsible for all costs involved in any required corrective actions, and shall defend, indemnify, and hold harmless the District, pursuant to the indemnification provisions of the Contract, for all damages and other claims arising therefrom.

If lead disturbance is anticipated in the Work, only persons with appropriate accreditation, registrations, licenses, and training shall conduct this Work.

It shall be the responsibility of the Contractor to properly dispose of any and all waste products, including, but not limited to, paint chips, any collected residue, or any other visual material that may occur from the prepping of any painted surface. It will be the responsibility of the Contractor to provide the proper disposal of any hazardous waste by a certified hazardous waste hauler. This company shall be registered with the Department of Transportation (DOT) and shall be able to issue a current manifest number upon transporting any hazardous material from any school site within the District.

The Contractor shall provide the District with any sample results prior to beginning Work, during the Work, and after the completion of the Work. The District may request to examine, prior to the commencement of the Work, the lead training records of each employee of the Contractor.

THE CONTRACTOR HEREBY ACKNOWLEDGES, UNDER PENALTY OF PERJURY, THAT IT:

1. HAS RECEIVED NOTIFICATION OF POTENTIAL LEAD-BASED MATERIALS ON THE OWNER'S PROPERTY;

2. IS KNOWLEDGEABLE REGARDING AND WILL COMPLY WITH ALL APPLICABLE LAWS, RULES, AND REGULATIONS GOVERNING WORK WITH, AND DISPOSAL, OF LEAD.

THE UNDERSIGNED WARRANTS THAT HE/SHE HAS THE AUTHORITY TO SIGN ON BEHALF OF AND BIND THE CONTRACTOR. THE DISTRICT MAY REQUIRE PROOF OF SUCH AUTHORITY.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.07

IMPORTED MATERIALS CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

This form shall be executed by all entities that, in any way, provide or deliver and/or supply any soils, aggregate, or related materials ("Fill") to the Project Site and shall be provided to the District at least ten (10) days before delivery. All Fill shall satisfy all requirements of any environmental review of the Project performed pursuant to the statutes and guidelines of the California Environmental Quality Act, section 21000 et seq. of the Public Resources Code ("CEQA"), and all requirements of section 17210 et seq. of the Education Code, including requirements for a Phase I environmental assessment acceptable to the State of California Department of Education and Department of Toxic Substances Control.

Certification of:
- □ Delivery Firm/Transporter
- □ Supplier
- □ Manufacturer
- □ Wholesaler
- □ Broker
- □ Retailer
- □ Distributor
- □ Other _____

Type of Entity
- □ Corporation
- □ General Partnership
- □ Limited Partnership
- □ Limited Liability Company
- □ Sole Proprietorship
- □ Other _____

Name of firm ("Firm"): _____

Mailing address: _____

Addresses of branch office used for this Project: _____

If subsidiary, name and address of parent company: _____

_____

By my signature below, I hereby certify that I am aware of section 25260 of the Health and Safety Code and the sections referenced therein regarding the definition of hazardous material. I further certify on behalf of the Firm that all soils, aggregates, or related materials provided, delivered, and/or supplied or that will be provided, delivered, and/or supplied by this Firm to the Project Site are free of any and all hazardous material as defined in section 25260 of the Health and Safety Code. I further certify that I am authorized to make this certification on behalf of the Firm.

Date: _____

Proper Name of Firm: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.08

CRIMINAL BACKGROUND INVESTIGATION /FINGERPRINTING CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

The undersigned does hereby certify to the District that I am a representative of the Contractor currently under contract with the District; that I am familiar with the facts herein certified; and that I am authorized and qualified to execute this certificate on behalf of Contractor.

Contractor certifies that it has taken at least one of the following actions (check all that apply):

☐ Pursuant to Education Code section 45125.2(a), Contractor has installed or will install, prior to commencement of Work, a physical barrier at the Work Site, that will limit contact between Contractor's employees, Subcontractors or suppliers and District pupils at all times; and/or

☐ Pursuant to Education Code section 45125.2(a), Contractor certifies that all employees will be under the continual supervision of, and monitored by, an employee of the Contractor who the California Department of Justice ("DOJ") has ascertained, or as described below, will ascertain, has not been convicted of a violent or serious felony. The name and title of the employee who will be supervising Contractor's and its subcontractors' or suppliers' employees is:

Name: _____

Title: _____

NOTE: If Contractor is a sole proprietor, and elects the above option, Contractor must have the above-named employee's fingerprints prepared and submitted by District for submission to the DOJ, in accordance with Education Code section 45125.1(h). No work shall commence until such determination by DOJ has been made.

☐ Pursuant to Education Code section 45125.2(a), the District will take appropriate steps to protect the safety of any pupils that may come in contact with Contractor's employees, subcontractors or suppliers so that the fingerprinting and criminal background investigation requirements of Education Code section 45125.2 shall not apply to Contractor under the Contract.

☐ The Work on the Contract is either (i) at an unoccupied school site and no employee of Contractor and/or subcontractor or supplier of any tier of the Contract shall come in contact with the District pupils or (ii) if Contractor's employees or any subcontractor or supplier of any tier of the Contract interacts with pupils, such interaction shall only take place under the immediate supervision and control of the pupil's parent or guardian or a school employee, so that the fingerprinting and criminal background investigation requirements of Education Code section 45125.1 shall not apply to Contractor under the Contract.

☐ The Contractor, who is not a sole proprietor, has complied with the fingerprinting requirements of Education Code section 45125.1 with respect to all Contractor's employees and all of its Subcontractors' employees who may have contact with District pupils in the course of providing services pursuant to the Contract, and the DOJ has determined (A) that none of those employees has been convicted of a felony, as that term is defined in Education Code section 45122.1 and/or (B) that the prohibition does not apply to an employee as provided by Education Code section 45125.1(e)(2) or (3). When the Contractor performs the criminal background check, it shall immediately provide any subsequent arrest and conviction information it receives to the District pursuant to the subsequent arrest service. No work shall commence until the Department of Justice ascertains that Contractor's employees and any subcontractors' employees have not been convicted of a felony as defined in Government Code Section 45122.1.

A complete and accurate list of Contractor's employees and of all of its subcontractors' employees who may come in contact with District pupils during the course and scope of the Contract is attached hereto as ATTACHMENT "A;" and/or

☐ The Contractor is a sole proprietor and intends to comply with the fingerprinting requirements of Education Code section 45125.1(h) with respect to all Contractor's employees who may have contact with District pupils in the course of providing services pursuant to the Contract, and hereby agrees to the District's preparation and submission of fingerprints such that the DOJ may determine (A) that none of those employees has been convicted of a felony, as that term is defined in Education Code section 45122.1 and/or (B) that the prohibition does not apply to an employee as provided by Education Code section 45125.1(e)(2) or (3). No work shall commence until the Department of Justice ascertains that Contractor's employees and any subcontractors' employees have not been convicted of a felony as defined in Government Code Section 45122.1.

Contractor's responsibility for background clearance extends to all of its employees, Subcontractors or suppliers, and employees of Subcontractors or suppliers coming into contact with District pupils regardless of whether they are designated as employees or acting as independent contractors of the Contractor.

[CONTINUED ON NEXT PAGE]

ATTACHMENT "A"

List of Employees/Subcontractors

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

Name/Company: _____

If further space is required for the list of employees/subcontractors, attach additional copies of this page.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.09

BUY AMERICAN CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

Federal regulations require that all of the iron, steel, and manufactured goods used in projects for the construction, installation, repairs, renovation, modernization, or maintenance of a public building or public work funded in part or in whole by federal stimulus funds, with the exception of projects funded by Qualified School Construction Bonds, be produced in the United States of America, unless a federal department waives this requirement because (1) it is inconsistent with the public interest, (2) the goods are not produced in sufficient quantities or of satisfactory quality in the United States, or (3) the requirement would increase the cost of the Project overall by more than twenty-five percent (25%) ("Buy American").

Contractor shall submit this Certification with its executed agreement, identifying the steps Contractor will take to use goods produced in the United States of America in carrying out this Contract. Bidder should not submit this form with its bid.

Contractor shall retain a copy of this form and may be subject to a future audit.

CERTIFICATION

On behalf of Contractor, I represent and covenant that Contractor will use on the Project only iron, steel and manufactured goods produced in the United States of America except goods for which a federal department has waived this requirement.

I, _____, certify that I am the Contractor's _____ _____ and that the representations and covenants made herein are true and correct. In making this certification, I am aware of section 12650 et seq. of the Government Code providing for the imposition of treble damages for making false claims.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.10

ROOFING PROJECT CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

Pursuant to Public Contract Code section 3000, et seq. this form shall be executed by all contractors, materials manufacturers, or vendors involved in a bid or proposal for the repair or replacement of a roof of a public school building where the project is either for repair of more than 25% of the roof or that has a total cost more than $21,000 ("roofing project") and submitted to the District when the award is made.

Certification of: □ Contractor □ Materials Manufacturer
□ Vendor □ Other _____

I, _____, _____, certify that I have not
[Name] [Name of Firm]
offered, given, or agreed to give, received, accepted, or agreed to accept, any gift, contribution, or any financial incentive whatsoever to or from any person in connection with the roofing project contract. As used in this certification, "person" means any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Furthermore, I, _____, _____, certify that
[Name] [Name of Firm]
I do not have, and throughout the duration of the contract, I will not have, any financial relationship in connection with the performance of this contract with any architect, engineer, roofing consultant, materials manufacturer, distributor, or vendor that is not disclosed below.

I, _____, _____, have the following
[Name] [Name of Firm]
financial relationships with an architect, engineer, roofing consultant, materials manufacturer, distributor, or vendor, or other person in connection with the following roofing project contract (provide Name and Address of Building, and Contract Date and Number):

_____

_____

_____

_____

_____

_____

_____

By my signature below, I hereby certify that, to the best of my knowledge, the contents of this disclosure are true, or are believed to be true. I further certify on behalf of the Firm that I am aware of section 3000 et seq. of the California Public Contract Code, and the sections referenced therein regarding the penalties for providing false information or failing to disclose a financial relationship in this disclosure. I further certify that I am authorized to make this certification on behalf of the Firm.

Date: _____

Proper Name of Firm: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 46.11

FEDERAL DEBARMENT CERTIFICATION

PROJECT/CONTRACT NO.: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** between the Sacramento City Unified School District ("District") and _____ _____ ("Contractor" or "Bidder") ("Contract" or "Project").

1. Bidder certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or Board;

b. Have not within a three-year period preceding this bid been convicted of or had a civil judgment rendered against them for commission of fraud or a 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;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

d. Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where Bidder is unable to certify to any of the statements in this certification, Bidder shall attach an explanation to this certification.

3. Bidder agrees to include the following certification in all subcontracts, for all lower tiers:

> *"Debarment and Suspension Certification – By submission of its proposal, the contractor (or vendor, or consultant, depending on the transaction) certifies to the best of its knowledge and belief that it and its principals are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency in accordance with 2 CFR 200.213 and 2 CFR 180."*

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

I. DOCUMENT 00 45 46.12

II. BYRD ANTI-LOBBYING CERTIFICATION

Applicable to Grants, Subgrants, Cooperative Agreements, and Contracts Exceeding $100,000 in Federal Funds

Submission of this certification is a prerequisite for making or entering into this transaction and is imposed by section 1352, Title 31, U.S. Code. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The undersigned certifies, to the best of their knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents of all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub- recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, United States Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

_____
Contractor

_____
Address

_____
Certified by: (type or print)

_____
Title

_____
Signature

_____
Date

Disclosure of Lobbying Activities Approved by OMB 0348-004

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See following page for public burden disclosure)

1. Type of Federal Action: ☐ contract ☐ grant ☐ cooperative agreement loan ☐ loan guarantee ☐ loan insurance	**2. Status of Federal Action:** ☐ proposal/offer/application ☐ initial award ☐ post-award	**3. Report Type:** ☐ initial filing ☐ material change For material change only: **Year_____quarter ____** **Date of last report_____**

4. Name and Address of Reporting Entity: **_____Prime _____Subawardee** **Tier_____, if Known:** **Congressional District**, *if known*:	**5. If Reporting Entity in No. 4 is Subawardee,** Enter Name and Address of Prime: **Congressional District**, if known:
6. Federal Department/Agency:	**7. Federal Program Name/Description:** CFDA Number, *if applicable*: _____
8. Federal Action Number, *if known:*	**9. Award Amount,** *if known:* $
10a. Name and Address of Lobbying Registrant *(if individual, last name, first name, MI):*	**10b. Individuals Performing** Services *(including address if different from No. 10a)* *(last name, first name, MI):*
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.	**Signature: _____** **Print Name: _____** **Title: _____** **Telephone No.: _____ Date: ____**
Federal Use Only	**Authorized for Local Reproduction** **Standard Form - LLL (Rev. 7-97)**

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to Title 31, U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.

2. Identify the status of the covered Federal action.

3. Identify the appropriate classification of this report. If this is a follow up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.

4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.

5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.

6. Enter the name of the federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.

7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.

8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitations for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Included prefixes, e.g., "RFP-DE-90-001."

9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.

10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10(a). Enter Last Name, First Name, and Middle Initial (MI).

11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

END OF DOCUMENT

DOCUMENT 00 45 49

REGISTERED SUBCONTRACTORS LIST
(Labor Code Section 1771.1)

PROJECT: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434**

Date Submitted (for Updates): _____

Contractor acknowledges and agrees that it must clearly set forth below the name and Department of Industrial Relations (DIR) registration number of each subcontractor **for all tiers** who will perform work or labor or render service to Contractor or its subcontractors in or about the construction of the Work **at least two (2) weeks before the subcontractor is scheduled to perform work**. This document is to be updated as all tiers of subcontractors are identified.

Contractor acknowledges and agrees that, if Contractor fails to list as to any subcontractor of any tier who performs any portion of Work, the Contract is subject to cancellation and the Contractor will be subjected to penalty under applicable law.

If further space is required for the list of proposed subcontractors, attach additional copies of page 2 showing the required information, as indicated below.

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

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DIR Registration #: _____

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Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Subcontractor Name: _____

DIR Registration #: _____

Portion of Work: _____

Date: _____

Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 45 90

POST BID INTERVIEW

PART 5 – GENERAL

5.01 SUMMARY

If requested by the District, this Section requires the apparent low bidder to attend and participate in a Post Bid Interview with the Construction Manager, prior to award of any contract by the District. The Post Bid Interview will be scheduled by the Construction Manager within three (3) calendar days after the date of bid.

5.02 REQUIRED ATTENDANCE

A. A duly authorized representative of the apparent low bidder is required to attend the Post Bid Interview, in person.

B. The apparent low bidder's authorized representative(s) must have (1) knowledge of how the bid submitted was prepared, (2) the person responsible for supervising performance of the Work, and (3) the authority to bind the apparent low bidder.

C. Failure to attend the Post Bid Interview as scheduled will be considered just cause for the District to reject the Bid as nonresponsive.

5.03 POST BID INTERVIEW PROCEDURE

A. The Construction Manager will review the Bid with the attendees.

B. The Construction Manager will review the Contract Documents with the attendees, including but not limited to:

(1) Insurance

(2) Bonding

(3) Addenda

(4) Pre-Bid Clarifications

(5) Scope of Work

(6) Bid Packages Descriptions

(7) Bid Alternates

(8) Contract Plans

(9) Contract Specifications

(10) Project Schedule and Schedule Requirements

(11) Critical Dates Requirement for Other Bid Packages

(12) Prevailing Wage Requirements

(13) Liquidated Damages

(14) Required Documentation for Contract Administration

(15) Contract Coordination Requirements

5.04 POST BID INTERVIEW DOCUMENTATION

The Construction Manager will document the Post Bid Interview on the form attached to this Section. Both the apparent low bidder and the Construction Manager are required to sign the Post Bid Interview Documentation.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

POST BID INTERVIEW

CONSTRUCTION MANAGER

[Name]
[Address 1]
[Address 2]
[Phone] [Fax]

BIDDER: _____

DATE: _____ TIME: _____ PHONE: _____

V. INTRODUCTIONS:

Present

A.

_____	_____
CONTRACTOR	CONTRACTOR
_____	_____
_____	_____
[CM]	[CM]

VI. PROPOSED CONTRACT:

VII. PURPOSE OF INTERVIEW IS TO ASSURE A MUTUAL UNDERSTANDING OF THE FOLLOWING:

A.	Do you acknowledge submission of a complete and accurate bid?	Yes	No
B.	Do you acknowledge the Bid Document submittal timelines after NOA and NTP and can you meet those timelines?	Yes	No
C.	Do you acknowledge the requirements for the escrow of bid documents?	Yes	No
D.	Are you comfortable with your listed subcontractors?	Yes	No

VIII. CONTRACTUAL REQUIREMENTS:

A.	Do you understand you are a prime contractor?	Yes	No
B.	Can you meet specified insurance requirements?	Yes	No
1.	Do any of your policies that require Additional Insured endorsements exceed the minimum coverage requirements?	Yes	No
2.	Are you requesting that the District accept an Excess Liability Insurance Policy to meet the policy limit?	Yes	No
3.	Will there be a gap between the per occurrence amount of any underlying policy and the start of the coverage under the Umbrella or Excess Liability Insurance Policy?	Yes	No

C. Will you provide the Performance Bond and Labor and Material Bond for 100% of the Contract Price as stipulated? Yes No

1. Cost for bonds: _____% Yes No

2. Is the cost of your bonds in your base bid? Yes No

3. Is your surety licensed to issue bonds in California? Yes No

D. Do you understand the fingerprinting requirements? Yes No

E. Is it understood that all workers must be paid prevailing wage? Yes No

F. Is it understood that all subcontractors of every tier must be registered as a public works contractor with the Department of Industrial Relations? Yes No

IX. SCOPE OF WORK:

A. Acknowledged Receipt of Addenda #1-__ Yes No

B. Are the costs for addenda items included in your bid? (if applicable) Yes No

C. Do you have a complete understanding of your Scope of Work under the proposed Agreement? Yes No

D. You have re-reviewed the documents and understand the Scope of the Work. Are there any items that require clarification? Yes No
If yes, please identify them.

1. _____

_____

2. _____

_____

3. _____

_____

Is (are) there additional cost(s) for the above item(s)? Yes No

E. Is the cost for allowance included in your bid? Yes No

F. Have you reviewed bid alternative(s) #1-___? (if applicable) Yes No

G. Are the costs for bid alternatives included in your bid? Yes No

H. Are the plans and specifications clear and understandable to your satisfaction? Yes No

I. Do you acknowledge that the time to submit notice of requests for substitution of specified materials has expired? Yes No

X. SCHEDULE:

A. Do you acknowledge and agree to the stipulated completion dates and milestones in the contract? Yes No

1. Will you provide a detailed construction schedule to _____ within the required ten (10) days of the Notice to Proceed, per the contract? Yes No

2. Can you meet the submittal deadline? Yes No

3. It is understood that the Project schedule is critical and that that weekend and overtime work may be required to meet the milestones. Yes No

4. It is understood that if rain does occur, then all dewatering and protection of work is required, per the contract. Yes No
If not, what do you believe must change and why? _____

_____

_____

B. Identify critical materials, deliveries, long lead items and other dependencies, including Owner Furnished items that could affect the completion of your work. Yes No

1. _____

2. _____

3. _____

4. _____

5. _____

C. Do you understand that there is going to be maintenance and other construction taking place on site during the course of the project? Yes No

XI. EXECUTION OF WORK

A. Do you understand the access to the site? Yes No

B. Do you understand the staging area restrictions? Yes No

C. Have you included protection of [asphalt, floors, and roofs]? Yes No

D. Do you understand that the site is occupied by students, teachers, administrators, parents, etc.? Yes No

XII. CONTRACTOR COMMENTS/SUGGESTIONS:

1. _____

2. _____

3. _____

4. _____

5. _____

XIII. CONTRACTOR

You agree the information contained herein is part of your contractual obligations. Your signature acknowledges your agreement to perform all Work in the Contract Documents, and that costs for all Work are included in your bid.

The foregoing information is true and accurate, and I am authorized to sign as an officer of the company I am representing.

[Company Name]

_____

Signature _____ Title: _____

Date: _____

XIV. CONSTRUCTION MANAGER

Signature _____ Title: _____

Date: _____

Title of Document: POST BID INTERVIEW
Number of Pages: _____
Date of Document: _____

END OF DOCUMENT

DOCUMENT 00 51 00

NOTICE OF AWARD

Dated: _____ 20__

To: _____ (Contractor)

_____
(Address)

From: Governing Board ("Board") of the Sacramento City Unified School District ("District")

Re: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434** ("Project").

Contractor has been awarded the Contract for the above-referenced Project on _____ _____, 20__, by action of the District's Board.

The Contract Price is _____ Dollars ($_____), and includes alternates _____.

Three (3) copies of each of the Contract Documents (except Drawings) accompany this Notice of Award. Three (3) sets of the Drawings will be delivered separately or otherwise made available. Additional copies are available at cost of reproduction.

You must comply with the following conditions precedent within **SEVEN (7)** calendar days of the date of this Notice of Award.

The Contractor shall execute and submit the following documents by 5:00 p.m. of the **SEVENTH (7th)** calendar day following the date of the Notice of Award.

a. Agreement: To be executed by successful Bidder. Submit three (3) copies, each bearing an original signature.

b. Escrow of Bid Documentation: This must include all required documentation. See the document titled Escrow Bid Documentation for more information.

c. Performance Bond (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.

d. Payment Bond (Contractor's Labor & Material Bond) (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.

e. Insurance Certificates and Endorsements as required.

f. Workers' Compensation Certification.

g. Prevailing Wage and Related Labor Requirements Certification.

h. Disabled Veteran Business Enterprise Participation Certification.

i. Drug-Free Workplace Certification.

j. Tobacco-Free Environment Certification.

k. Hazardous Materials Certification.

l. Lead-Based Materials Certification.

m. Imported Materials Certification.

n. Criminal Background Investigation/Fingerprinting Certification.

Failure to comply with these conditions within the time specified will entitle District to consider your bid abandoned, to annul this Notice of Award, and to declare your Bid Security forfeited, as well as any other rights the District may have against the Contractor.

After you comply with those conditions, District will return to you one fully signed counterpart of the Agreement.

SACRAMENTO CITY UNIFIED SCHOOL DISTRICT

BY: _____

NAME: _____

TITLE: _____

END OF DOCUMENT

DOCUMENT 00 52 13

AGREEMENT

THIS AGREEMENT IS MADE AND ENTERED INTO THIS _____ DAY OF _____, _____, 20___, by and between the Sacramento City Unified School District ("District") and _____ ("Contractor") ("Agreement").

WITNESSETH: That the parties hereto have mutually covenanted and agreed, and by these presents do covenant and agree with each other, as follows:

15. **The Work**: Contractor agrees to furnish all tools, equipment, apparatus, facilities, labor, and material necessary to perform and complete in a good and workmanlike manner, the work of the following project:

    Luther Burbank HS Core Academic Renovation Phase #2, # 0530-434

    ("Project" or "Contract" or "Work")

    It is understood and agreed that the Work shall be performed and completed as required in the Contract Documents including, without limitation, the Drawings and Specifications and submission of all documents required to secure funding or by the Division of the State Architect for close-out of the Project, under the direction and supervision of, and subject to the approval of, the District or its authorized representative.

16. **The Contract Documents**: The complete Contract consists of all Contract Documents as defined in the General Conditions and incorporated herein by this reference. Any and all obligations of the District and Contractor are fully set forth and described in the Contract Documents. All Contract Documents are intended to cooperate so that any Work called for in one and not mentioned in the other or vice versa is to be executed the same as if mentioned in all Contract Documents.

17. **Interpretation of Contract Documents**: Should any question arise concerning the intent or meaning of Contract Documents, including the Drawings or Specifications, the question shall be submitted to the District for interpretation. If a conflict exists in the Contract Documents, valid, written modifications, beginning with the most recent, shall control over this Agreement (if any), which shall control over the Special Conditions, which shall control over any Supplemental Conditions, which shall control over the General Conditions, which shall control over the remaining Division 0 documents, which shall control over Division 1 Documents which shall control over Division 2 through Division 49 documents, which shall control over figured dimensions, which shall control over large-scale drawings, which shall control over small-scale drawings. In the case of a discrepancy or ambiguity solely between and among the Drawings and Specifications, the discrepancy or ambiguity shall be resolved in favor of the interpretation that will provide District with the functionally complete and operable Project described in the Drawings and Specifications. In no case shall a document calling for lower quality and/or quantity material or workmanship control. The decision of the District in the matter shall be final.

18. **Time for Completion**: It is hereby understood and agreed that the Work under this Contract shall be completed within **October 25, 2023** ("Contract Time") from the date specified in the District's Notice to Proceed.

19. **Completion - Extension of Time**: Should the Contractor fail to complete this Contract, and the Work provided herein, within the time fixed for completion, due allowance being made for the contingencies provided for herein, the Contractor shall become liable to the District for all loss and damage that the District may suffer on account thereof. The Contractor shall coordinate its Work with the Work of all other contractors. The District shall not be liable for delays resulting from Contractor's failure to coordinate its Work with other contractors in a manner that will allow timely completion of Contractor's Work. Contractor shall be liable for delays to other contractors caused by Contractor's failure to coordinate its Work with the Work of other contractors.

20. **Liquidated Damages**: Time is of the essence for all work under this Agreement. It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage that the District will sustain in the event of and by reason of Contractor's delay; therefore, Contractor agrees that it shall pay to the District the sum of **$ 500.00 dollars per day** as liquidated damages for each and every day's delay beyond the time herein prescribed in completion of the Work.

    It is hereby understood and agreed that this amount is not a penalty.

    In the event that any portion of the liquidated damages is not paid to the District, the District may deduct that amount from any money due or that may become due the Contractor under this Agreement, and such deduction does not constitute a withholding or penalty. The District's right to assess liquidated damages is as indicated herein and in the General Conditions.

    The time during which the Contract is delayed for cause, as hereinafter specified, may extend the time of completion for a reasonable time as the District may grant, provided that Contractor has complied with the claims procedure of the Contract Documents. This provision does not exclude the recovery of damages by either party under other provisions in the Contract Documents.

21. **Loss Or Damage**: The District and its agents and authorized representatives shall not in any way or manner be answerable or suffer loss, damage, expense, or liability for any loss or damage that may happen to the Work, or any part thereof, or in or about the same during its construction and before acceptance, and the Contractor shall assume all liabilities of every kind or nature arising from the Work, either by accident, negligence, theft, vandalism, or any cause whatsoever; and shall hold the District and its agents and authorized representatives harmless from all liability of every kind and nature arising from accident, negligence, or any cause whatsoever.

22. **Limitation Of District Liability:** District's financial obligations under this Contract shall be limited to the payment of the compensation provided in this Contract. Notwithstanding any other provision of this Contract, in no event shall District be liable, regardless of whether any claim is based on contract or tort, for any special, consequential, indirect or incidental damages, including, but not limited to, lost profits or revenue, lost bonding capacity, arising out of or in connection with this Contract for the services performed in connection with this Contract.

23. **Insurance and Bonds**: Prior to issuance of the Notice to Proceed by the District, Contractor shall provide all required certificates of insurance, insurance endorsements, and payment and performance bonds as evidence thereof.

24. **Prosecution of Work**: If the Contractor should neglect to prosecute the Work properly or fail to perform any provisions of this Contract, the District, may, pursuant to the General Conditions and without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

25. **Authority of Architect, Project Inspector, and DSA**: Contractor hereby acknowledges that the Architect(s), the Project Inspector(s), and the Division of the State Architect ("DSA") have authority to approve and/or suspend Work if the Contractor's Work does not comply with the requirements of the Contract Documents, Title 24 of the California Code of Regulations, and all applicable laws and regulations. The Contractor shall be liable for any delay caused by its non-compliant Work.

26. **Assignment of Contract**: Neither the Contract, nor any part thereof, nor any moneys due or to become due thereunder, may be assigned by the Contractor without the prior written approval of the District, nor without the written consent of the Surety on the Contractor's Performance Bond (the "Surety"), unless the Surety has waived in writing its right to notice of assignment.

27. **Classification of Contractor's License**: Contractor hereby acknowledges that it currently holds valid Type **B Contractor's license(s)** issued by the State of California, Contractors' State License Board, in accordance with division 3, chapter 9, of the Business and Professions Code and in the classification called for in the Contract Documents.

28. **Registration as Public Works Contractor**: The Contractor and all Subcontractors currently are registered as public works contractors with the Department of Industrial Relations, State of California, in accordance with Labor Code section 1771.1.

29. **Payment of Prevailing Wages**: The Contractor and all Subcontractors shall pay all workers on all Work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code.

30. **Labor Compliance Monitoring and Enforcement**: This Project is subject to labor compliance monitoring and enforcement by the Department of Industrial Relations pursuant to Labor Code section 1771.4 and Title 8 of the California Code of Regulations. Contractor specifically acknowledges and understands that it shall perform the Work of this Agreement while complying with all the applicable provisions of Division 2, Part 7, Chapter 1, of the Labor Code, including, without limitation, the requirement that the Contractor and all of its Subcontractors shall timely submit complete and accurate electronic certified payroll records as required by the Contract Documents, or the District may not issue payment.

31. **Contract Price**: In consideration of the foregoing covenants, promises, and agreements on the part of the Contractor, and the strict and literal fulfillment of each and every covenant, promise, and agreement, and as compensation agreed upon for the Work and construction, erection, and completion as aforesaid, the District covenants, promises, and agrees that it will well and truly pay and cause to be paid to the Contractor in full, and as the full Contract Price and compensation for construction, erection, and completion of the Work hereinabove agreed to be performed by the Contractor, the following price:

_____ Dollars

($_____),

in lawful money of the United States, which sum is to be paid according to the schedule provided by the Contractor and accepted by the District and subject to additions and deductions as provided in the Contract. This amount supersedes any previously stated and/or agreed to amount(s).

32. **No Representations:** No representations have been made other than as set forth in writing in the Contract Documents, including this Agreement. Each of the Parties to this Agreement warrants that it has carefully read and understood the terms and conditions of this Agreement and all Contract Documents, and that it has not relied upon the representations or advice of any other Party or any attorney not its own.

33. **Entire Agreement:** The Contract Documents, including this Agreement, set forth the entire agreement between the parties hereto and fully supersede any and all prior agreements, understandings, written or oral, between the parties hereto pertaining to the subject matter thereof.

34. **Severability**: If any term, covenant, condition, or provision in any of the Contract Documents is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remainder of the provisions in the Contract Documents shall remain in full force and effect and shall in no way be affected, impaired, or invalidated thereby.

35. **Authority of Signatories**: Each party has the full power and authority to enter into and perform this Contract, and the person signing this Contract on behalf of each party has been properly authorized and empowered to enter into this Contract. This Contract may be executed in one or more counterparts, each of which shall be deemed an original. For this Agreement, and for all Contract Documents requiring a signature, a facsimile or electronic signature shall be deemed to be the equivalent of the actual original signature. All counterparts so executed shall constitute one Contract binding all the Parties hereto.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, accepted and agreed on the date indicated above:

[CONTRACTOR NAME]	**SACRAMENTO CITY UNIFIED SCHOOL DISTRICT**
_____	_____
By: _____	By: _____
Title: _____	Title: _____

NOTE: If the party executing this Contract is a corporation, a certified copy of the by-laws, or of the resolution of the Board of Directors, authorizing the officers of said corporation to execute the Contract and the bonds required thereby must be attached hereto.

END OF DOCUMENT

DOCUMENT 00 55 00

NOTICE TO PROCEED

Dated: _____, 20___

TO: _____
("Contractor")

ADDRESS: _____

PROJECT: **Luther Burbank HS Core Academic Renovation Phase #2, #0530-434**

PROJECT/CONTRACT NO.: _____ between the Sacramento City Unified School District and Contractor ("Contract").

You are notified that the Contract Time under the above Contract will commence to run on _____, 20___. By that date, you are to start performing your obligations under the Contract Documents. In accordance with the Agreement executed by Contractor, the date of completion is _____, 20___.

You must submit the following documents by 5:00 p.m. of the TENTH (10th) calendar day following the date of this Notice to Proceed:

a. Contractor's preliminary schedule of construction.

b. Contractor's preliminary schedule of values for all of the Work.

c. Contractor's preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals

d. Contractor's Safety Plan specifically adapted for the Project.

e. Registered Subcontractors List: A complete subcontractors list for all tiers, including the name, address, telephone number, email address, facsimile number, California State Contractors License number, license classification, Department of Industrial Relations registration number, and monetary value of all Subcontracts.

Thank you. We look forward to a very successful Project.

SACRAMENTO CITY UNIFIED SCHOOL DISTRICT

BY: _____

NAME: _____

TITLE: _____

END OF DOCUMENT

DOCUMENT 00 56 00

ESCROW BID DOCUMENTATION

1. Requirement to Escrow Bid Documentation

a. Contractor shall submit, within **SEVEN (7)** calendar days after the date of the Notice of Award, one copy of all documentary information received or generated by Contractor in preparation of bid prices for this Contract, as specified herein. This material is referred to herein as "Escrow Bid Documentation." The Escrow Bid Documentation of the Contractor will be held in escrow for the duration of the Contract.

b. Contractor agrees, as a condition of award of the Contract, that the Escrow Bid Documentation constitutes all written information used in the preparation of its bid, and that no other written bid preparation information shall be considered in resolving disputes or claims. Contractor also agrees that nothing in the Escrow Bid Documentation shall change or modify the terms or conditions of the Contract Documents.

c. The Escrow Bid Documentation will not be opened by District except as indicated herein. The Escrow Bid Documentation will be used only for the resolution of change orders and claims disputes.

d. Contractor's submission of the Escrow Bid Documentation, as with the bonds and insurance documents required, is considered an essential part of the Contract award. Should the Contractor fail to make the submission within the allowed time specified above, District may deem the Contractor to have failed to enter into the Contract, and the Contractor shall forfeit the amount of its bid security, accompanying the Contractor's bid, and District may award the Contract to the next lowest responsive responsible bidder.

e. NO PAYMENTS WILL BE MADE, NOR WILL DISTRICT ACCEPT PROPOSED CHANGE ORDERS UNTIL THE ABOVE REQUIRED INFORMATION IS SUBMITTED AND APPROVED.

f. The Escrow Bid Documentation shall be submitted in person by an authorized representative of the Contractor to the District.

2. Ownership of Escrow Bid Documentation

a. The Escrow Bid Documentation is, and shall always remain, the property of Contractor, subject to review by District, as provided herein.

b. Escrow Bid Documentation constitute trade secrets, not known outside Contractor's business, known only to a limited extent and only by a limited number of employees of Contractor, safeguarded while in Contractor's possession, extremely valuable to Contractor, and could be extremely valuable to Contractor's competitors by virtue of reflecting Contractor's contemplated techniques of construction. Subject to the provisions herein, District agrees to safeguard the Escrow Bid Documentation, and all information contained therein, against disclosure to the fullest extent permitted by law.

3. Format and Contents of Escrow Bid Documentation

a. Contractor may submit Escrow Bid Documentation in its usual cost-estimating format; a standard format is not required. The Escrow Bid Documentation shall be submitted in the language (e.g., English) of the specification.

b. Escrow Bid Documentation must clearly itemize the estimated costs of performing the work of each bid item contained in the bid schedule, separating bid items into sub-items as required to present a detailed cost estimate and allow a detailed cost review. The Escrow Bid Documentation shall include all subcontractor bids or quotes, supplier bids or quotes, quantity takeoffs, crews, equipment, calculations of rates of production and progress, copies of quotes from subcontractors and suppliers, and memoranda, narratives, add/deduct sheets, and all other information used by the Contractor to arrive at the prices contained in the bid proposal. Estimated costs should be broken down into Contractor's usual estimate categories such as direct labor, repair labor, equipment ownership and operation, expendable materials, permanent materials, and subcontract costs as appropriate. All labor rates must be broken down to specify any and all burden costs including, but not limited to, health and welfare pay, vacation and holiday pay, pension contributions, training rates, benefits of any kind, insurance of any kind, workers' compensation, liability insurance, truck expenses, supply expenses of any kind, payroll taxes, and any other taxes of any kind. Plant and equipment and indirect costs should be detailed in the Contractor's usual format. The Contractor's allocation of indirect costs, contingencies, markup, and other items to each bid item shall be identified.

c. All costs shall be identified. For bid items amounting to less than $10,000, estimated unit costs are acceptable without a detailed cost estimate, provided that labor, equipment, materials, and subcontracts, as applicable, are included and provided that indirect costs, contingencies, and markup, as applicable, are allocated.

d. Bid Documentation provided by District should not be included in the Escrow Bid Documentation unless needed to comply with the following requirements.

4. Submittal of Escrow Bid Documentation

a. The Escrow Bid Documentation shall be submitted by the Contractor in a sealed container within **SEVEN (7)** calendar days after the date of the Notice of Award. The container shall be clearly marked on the outside with the Contractor's name, date of submittal, project name and the words "Escrow Bid Documentation – Intended to be opened in the presence of Authorized Representatives of Both District and Contractor".

b. By submitting Escrow Bid Documentation, Contractor represents that the material in the Escrow Bid Documentation constitutes all the documentary information used in preparation of the bid and that the Contractor has personally examined the contents of the Escrow Bid Documentation container and has found that the documents in the container are complete.

c. If Contractor's proposal is based upon subcontracting any part of the work, each subcontractor whose total subcontract price exceeds 5 percent of the

total contract price proposed by Contractor, shall provide separate Escrow Documents to be included with those of Contractor. Those documents shall be opened and examined in the same manner and at the same time as the examination described above for Contractor.

d. If Contractor wishes to subcontract any portion of the Work after award, District retains the right to require Contractor to submit Escrow Documents for the Subcontractor before the subcontract is approved.

5. Storage, Examination and Final Disposition of Escrow Bid Documentation

a. The Escrow Bid Documentation will be placed in escrow, for the life of the Contract, in a mutually agreeable institution. The cost of storage will be paid by Contractor for the duration of the project until final Contract payment. The storage facilities shall be the appropriate size for all the Escrow Bid Documentation and located conveniently to both District's and Contractor's offices.

b. The Escrow Bid Documentation shall be examined by both District and Contractor, at any time deemed necessary by either District or Contractor, to assist in the negotiation of price adjustments and change orders or the settlement of disputes and claims. In the case of legal proceedings, Escrow Bid Documentation shall be used subject to the terms of an appropriate protective order if requested by Contractor and ordered by a court of competent jurisdiction. Examination of the Escrow Bid Documentation is subject to the following conditions:

(1) As trade secrets, the Escrow Bid Documentation is proprietary and confidential to the extent allowed by law.

(2) District and Contractor shall each designate, in writing to the other party **SEVEN (7)** calendar days prior to any examination, the names of representatives who are authorized to examine the Escrow Bid Documentation. No other person shall have access to the Escrow Bid Documentation.

(3) Access to the documents may take place only in the presence of duly designated representatives of the District and Contractor. If Contractor fails to designate a representative or appear for joint examination on **SEVEN (7)** calendar days' notice, then the District representative may examine the Escrow Bid Documents alone upon an additional **THREE (3)** calendar days' notice if a representative of the Contractor does not appear at the time set.

(4) If a subcontractor has submitted sealed information to be included in the Escrow Bid Documents, access to those documents may take place only in the presence of a duly designated representative of the District, Contractor and that subcontractor. If that subcontractor fails to designate a representative or appear for joint examination on **SEVEN (7)** calendar days' notice, then the District representative and/or the Contractor may examine the Escrow Bid Documentation without that subcontractor present upon an additional **THREE (3)** calendar days' notice if a representative of that subcontractor does not appear at the time set.

c. The Escrow Bid Documentation will be returned to Contractor at such time as the Contract has been completed and final settlement has been achieved.

END OF DOCUMENT

DOCUMENT 00 57 00

ESCROW AGREEMENT IN LIEU OF RETENTION
(Public Contact Code Section 22300)

(Note: Contractor must use this form.)

This Escrow Agreement in Lieu of Retention ("Escrow Agreement") is made and entered into this _____ day of _____, 20___, by and between the Sacramento City Unified School District ("District"), whose address is 5735 47th Avenue, Sacramento, California 95824, and _____ ("Contractor"), whose address is _____ , and _____ _____ ("Escrow Agent"), a state or federally chartered bank in the state of California, whose address is _____.

For the consideration hereinafter set forth, District, Contractor, and Escrow Agent agree as follows:

36. Pursuant to section 22300 of Public Contract Code of the State of California, which is hereby incorporated by reference, Contractor has the following two (2) options:

    ☐ Deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by District pursuant to the Construction Contract No.___ entered into between District and Contractor for the _____ _____ Project, in the amount of _____ Dollars ($_____) dated, _____, 20_____, (the "Contract"); **or**

    ☐ On written request of Contractor, District shall make payments of the retention earnings for the above referenced Contract directly to Escrow Agent.

    When Contractor deposits the securities as a substitute for Contract earnings (first option), Escrow Agent shall notify District within ten (10) calendar days of the deposit. The market value of the securities at the time of substitution and at all times from substitution until the termination of the Escrow Agreement shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Contract between District and Contractor.

    Securities shall be held in the name of Sacramento City Unified School District, and shall designate Contractor as beneficial owner.

37. District shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in form and amount specified above.

38. When District makes payment of retentions earned directly to Escrow Agent, Escrow Agent shall hold them for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the Parties shall be equally applicable and binding when District pays Escrow Agent directly.

39. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account, and all expenses of District. The District will charge Contractor $_____ for each of District's deposits to the escrow account. These expenses and payment terms shall be determined by District, Contractor, and Escrow Agent.

40. Interest earned on securities or money market accounts held in escrow and all interest earned on that interest shall be for sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to District.

41. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from District to Escrow Agent that District consents to withdrawal of amount sought to be withdrawn by Contractor.

42. District shall have the right to draw upon the securities and/or withdraw amounts from the Escrow Account in the event of default by Contractor. Upon seven (7) days' written notice to Escrow Agent from District of the default, if applicable, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by District. Escrow Agent shall not be authorized to determine the validity of any notice of default given by District pursuant to this paragraph, and shall promptly comply with District's instructions to pay over said escrowed assets. Escrow Agent further agrees to not interplead the escrowed assets in response to a conflicting demand.

43. Upon receipt of written notification from District certifying that the Contract is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all monies and securities on deposit and payments of fees and charges.

44. Escrow Agent shall rely on written notifications from District and Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Escrow Agreement and District and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth above.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

45. Names of persons who are authorized to give written notice or to receive written notice on behalf of District and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of District:	On behalf of Contractor:
Title	Title
Name	Name
Signature	Signature
Address	Address

On behalf of Escrow Agent:

Title

Name

Signature

Address

At the time that the Escrow Account is opened, District and Contractor shall deliver to Escrow Agent a fully executed copy of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date first set forth above.

On behalf of District:	On behalf of Contractor:
Title	Title
Name	Name
Signature	Signature
Address	Address

END OF DOCUMENT

DOCUMENT 00 61 13.13

PERFORMANCE BOND
(100% of Contract Price)

(Note: Contractor must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the governing board ("Board") of the Sacramento City UnifiedSchool District, ("District") and _____ ("Principal") have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to perform the following project:

Luther Burbank HS Core Academic Renovation Phase #2, #0530-434 ("Project" or "Contract") which Contract dated _____, 20___, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof; and

WHEREAS, said Principal is required under the terms of the Contract to furnish a bond for the faithful performance of the Contract.

NOW, THEREFORE, the Principal and _____ _____ ("Surety") are held and firmly bound unto the Board of the District 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, to:

- Promptly perform all the work required to complete the Project; and

- Pay to the District all damages the District incurs as a result of the Principal's failure to perform all the Work required to complete the Project.

Or, at the District's sole discretion and election, the Surety shall obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by the District of the lowest responsible bidder, arrange for a contract between such bidder and the District and make available as Work progresses sufficient funds to pay the cost of completion less the "balance of the Contract Price," and to pay and perform all obligations of Principals under the Contract, including, without limitation, all obligations with respect to warranties, guarantees and the payment of liquidated damages. The term "balance of the Contract Price," as used in this paragraph, shall mean the total amount payable to Principal by the District under the Contract and any modifications thereto, less the amount previously paid by the District to the Principal, less any withholdings by the District allowed under the Contract. District shall not be required or obligated to accept a tender of a completion contractor from the Surety for any or no reason.

The condition of the obligation is such that, if the above bound Principal, its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and agreements in the Contract and any alteration thereof made as therein provided, on its part to be kept and performed at the time and in the intent and meaning, including all contractual guarantees and warrantees of materials and workmanship,

and shall indemnify and save harmless the District, its trustees, officers and agents, as therein stipulated, then this obligation shall become null and void, otherwise it shall be and remain in full force and virtue.

Surety expressly agrees that the District may reject any contractor or subcontractor proposed by Surety to fulfill its obligations in the event of default by the Principal. Surety shall not utilize Principal in completing the Work nor shall Surety accept a Bid from Principal for completion of the Work if the District declares the Principal to be in default and notifies Surety of the District's objection to Principal's further participation in the completion of the Work.

As a condition precedent to the satisfactory completion of the Contract, the above obligation shall hold good for a period equal to the warranty and/or guarantee period of the Contract, during which time Surety's obligation shall continue if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the District from loss or damage resulting from or caused by defective materials or faulty workmanship. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the District's rights or the Contractor or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond. The Surety also stipulates and agrees that it shall not be exonerated or released from the obligation of this bond by any overpayment or underpayment by the District that is based upon estimates approved by the Architect. The Surety does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work or to the specifications.

IN WITNESS WHEREOF, two (2) 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	Surety
By	By
	Name of California Agent of Surety
	Address of California Agent of Surety
	Telephone No. of California Agent of Surety

Contractor must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer.

END OF DOCUMENT

DOCUMENT 00 61 13.16

PAYMENT BOND
Contractor's Labor & Material Bond
(100% Of Contract Price)

(Note: Contractor must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the governing board ("Board") of the Sacramento City Unified School District, ("District") and _____, ("Principal") have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to perform the following project:

Luther Burbank HS Core Academic Renovation Phase #2, #0530-434

("Project" or "Contract") which Contract dated _____, 20___, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof; and

WHEREAS, pursuant to law and the Contract, the Principal is required, before entering upon the performance of the work, to file a good and sufficient bond with the body by which the Contract is awarded in an amount equal to one hundred percent (100%) of the Contract price, to secure the claims to which reference is made in sections 9000 through 9510 and 9550 through 9566 of the Civil Code, and division 2, part 7, of the Labor Code.

NOW, THEREFORE, the Principal and_____
_____ ("Surety")
are held and firmly bound unto all laborers, material men, and other persons referred to in said statutes in the sum of _____
Dollars ($_____), lawful money of the United States, being a sum not less than the total amount payable by the terms of Contract, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally, by these presents.

The condition of this obligation is that if the Principal or any of its subcontractors, or their heirs, executors, administrators, successors, or assigns of any, all, or either of them shall fail to pay for any labor, materials, provisions, or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the Principal or any of his or its subcontractors of any tier under Section 13020 of the Unemployment Insurance Code with respect to such work or labor, that the Surety will pay the same in an amount not exceeding the amount herein above set forth, and also in case suit is brought upon this bond, will pay a reasonable attorney's fee to be awarded and fixed by the court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under section 9100 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void; otherwise it shall be and remain in full force and affect.

And the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of Contract or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

IN WITNESS WHEREOF, two (2) 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	Surety
By	By
	Name of California Agent of Surety
	Address of California Agent of Surety
	Telephone No. of California Agent of Surety

Contractor must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer.

END OF DOCUMENT

DOCUMENT 00 63 40

ALLOWANCE EXPENDITURE DIRECTIVE FORM

Sacramento City Unified School District
5735 47th Avenue
Sacramento, CA 95824

ALLOWANCE EXPENDITURE DIRECTIVE NO.:

ALLOWANCE EXPENDITURE DIRECTIVE

Project: Luther Burbank HS Core Academic Renovation Phase #2

Date: _____
DSA File No.:_____
DSA Appl. No._____

Bid No.: # 0530-434

The following parties agree to the terms of this Allowance Expenditure Directive ("AED"):

Owner Name, Address, Telephone:

_____
_____
_____

Contractor Name, Address, Telephone:

_____
_____
_____

Reference	**Description**	**Allowance Authorized for Expenditure**
Request for AED # Requested by: Performed by: Reason:	[Description of unforeseen item relating to Work] [Requester] [Performer] [Reason]	$
Request for AED # Requested by: Performed by: Reason:	[Description of unforeseen item relating to Work] [Requester] [Performer] [Reason]	$
Request for AED # Requested by: Performed by: Reason:	[Description of unforeseen item relating to Work] [Requester] [Performer] [Reason]	$

Total Contract Allowance Amount:	$
Amount of Previously Approved Allowance Expenditure Directive(s):	$
Amount of this Allowance Expenditure Directive:	$

The undersigned Contractor approves the foregoing release of allowance for completion of each specified item, and agrees to furnish all labor, materials and services and perform all

work necessary to complete any additional work specified for the consideration stated therein ("Work"). Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650, et seq.

This Allowance Expenditure Directive must be signed by an authorized District representative.

It is expressly understood that the authorized allowance expenditure granted herein represents a full accord and satisfaction for any and all cost impacts of the items herein, and Contractor waives any and all further compensation based on the items herein. The value of the extra work or changes expressly includes any and all of the Contractor's costs and expenses, and its subcontractors, both direct and indirect. Any costs, expenses, or damages not included are deemed waived.

Signatures:

DISTRICT: SACRAMENTO CITY UNIFIED SCHOOL DISTRICT Date: _____ By:_____ [Print Name and Title here]	**CONTRACTOR:** _____ Date: _____ By:_____ [Print Name and Title here]
ARCHITECT: _____ Date: _____ By:_____ [Print Name and Title here]	**PROJECT INSPECTOR:** _____ Date: _____ By:_____ [Print Name and Title here]

END OF DOCUMENT

DOCUMENT 00 63 47

DAILY FORCE ACCOUNT REPORT

From: Contractor
[Name/Address]

To: Owner
[Name/Address]

Project: Luther Burbank HS Core Academic Renovation Phase #2, # 0530-434

Contractor hereby submits this Daily Force Account Report for Work performed, pursuant to Force Account Directive No. _____, on _____.
[Date of Work]

Contractor attests that the material, labor, and equipment itemized herein were used only on the force account work.

A. Material: *Attach all applicable invoices not provided in prior Daily Force Account Reports and complete the information below.*

Description	Unit Price	Quantity	Cost

Daily subtotal (w/out markup): $_____

B. Labor: *Labor must be fully Burdened. Attach timesheets, if applicable, and complete the information below.*

Name	Craft	Regular Hrs.	Rate	OT Hrs.	Rate

Daily subtotal (w/out markup): $_____

C. Equipment: *Attach all applicable invoices not provided in prior Daily Force Account Reports and complete the information below.*

Type / Model	Hrs. Operated	Rate

Daily subtotal (w/out markup): $_____

Complete based on information reported above.

	WORK PERFORMED OTHER THAN BY CONTRACTOR	**ADD**
(a)	**Material**	
(b)	**Add Labor**	
(c)	**Add Equipment**	
(d)	**Subtotal**	
(e)	**Add overhead and profit for any and all tiers of Subcontractor**, the total not to exceed ten percent (10%) of Item (d)	
(f)	**Subtotal**	
(g)	**Add Overhead and Profit for Contractor**, not to exceed five percent (5%) of Item (f)	
(h)	**Subtotal**	
(i)	**Add Bond and Insurance**, not to exceed two percent (2%) of Item (h)	
(j)	**TOTAL**	

	WORK PERFORMED BY CONTRACTOR	**ADD**
(a)	**Material**	
(b)	**Add Labor**	
(c)	**Add Equipment**	
(d)	**Subtotal**	
(e)	**Add Overhead and Profit for Contractor**, not to exceed fifteen percent (15%) of Item (d)	
(f)	**Subtotal**	
(g)	**Add Bond and Insurance**, not to exceed two percent (2%) of Item (f)	
(h)	**TOTAL**	

Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act (Gov. Code, § 12650 et seq.).

It is expressly understood that all force account work for the date stated above must be reported herein, and Contractor may not claim any labor, equipment, material or any other costs or expenses not reported herein. Contractor is not entitled to separately recover amounts for overhead or other indirect costs. Any costs, expenses, or damages, not included are deemed waived.

SUBMITTED BY:		**REVIEWED BY:**	
Contractor:		District:	
[Name]	Date	[Name]	Date

District may require additional information from Contractor to review this Daily Force Account Report. Upon District's return of the Daily Force Account Report, Contractor may invoice the Work reflected therein. District's review and return of the Daily Force Account Report and/or payment for the force account work does not constitute acceptance of the Work or waiver of any Contract rights or criteria.

END OF DOCUMENT

DOCUMENT 00 63 57

PROPOSED CHANGE ORDER FORM

Sacramento City Unified School District
5735 47th Avenue
Sacramento, CA 95824

PCO NO.:

Project: Luther Burbank HS Core Academic Renovation Phase #2
Bid No.: #0530-434
RFI #:_____

Date: _____
DSA File No.: _____
DSA Appl. No.:_____

Contractor hereby submits for District's review and evaluation this Proposed Change Order ("PCO"), submitted in accordance with and subject to the terms of the Contract Documents, including Sections 17.7 and 17.8 of the General Conditions. Any spaces left blank below are deemed no change to cost or time.

Contractor understands and acknowledges that documentation supporting Contractor's PCO must be attached and included for District review and evaluation. Contractor further understands and acknowledges that failure to include documentation sufficient to, in District's discretion, support some or all of the PCO, shall result in a rejected PCO.

	WORK PERFORMED OTHER THAN BY CONTRACTOR	**ADD**	**DEDUCT**
(i)	**Material** (attach suppliers' invoice or itemized quantity and unit cost plus sales tax)		
(j)	**Add Labor** (attach itemized hours and rates, fully Burdened, and specify the hourly rate for each additional labor burden, for example, payroll taxes, fringe benefits, etc.)		
(k)	**Add Equipment** (attach suppliers' invoice)		
(l)	**Subtotal**		
(m)	**Add overhead and profit for any and all tiers of Subcontractor**, the total not to exceed ten percent (10%) of Item (d)		
(n)	**Subtotal**		
(o)	**Add General Conditions** (if Time is Compensable) (attach supporting documentation)		
(p)	**Subtotal**		
(q)	**Add Overhead and Profit for Contractor**, not to exceed five percent (5%) of Item (h)		
(r)	**Subtotal**		
(s)	**Add Bond and Insurance**, not to exceed two percent (2%) of Item (j)		
(t)	**TOTAL**		
(u)	**Time** (zero unless indicated; "TBD" not permitted)	**_____ Calendar Days**	

[REMAINDER OF PAGE LEFT BLANK INTENTIONALLY]

	WORK PERFORMED BY CONTRACTOR	**ADD**	**DEDUCT**
(v)	**Material** (attach itemized quantity and unit cost plus sales tax)		
(w)	**Add Labor** (attach itemized hours and rates, fully Burdened, and specify the hourly rate for each additional labor burden, for example, payroll taxes, fringe benefits, etc.)		
(x)	**Add Equipment** (attach suppliers' invoice)		
(y)	**Add General Conditions** (if Time is Compensable) (attach supporting documentation)		
(z)	**Subtotal**		
(aa)	**Add Overhead and Profit for Contractor**, not to exceed fifteen percent (15%) of Item (e)		
(bb)	**Subtotal**		
(cc)	**Add Bond and Insurance**, not to exceed two percent (2%) of Item (g)		
(dd)	**TOTAL**		
(ee)	**Time** (zero unless indicated; "TBD" not permitted)	**____ Calendar Days**	

The undersigned Contractor approves the foregoing as to the changes, if any, to the Contract Price specified for each item, and as to the extension of time allowed, if any, for completion of the entire Work as stated herein, and agrees to furnish all labor, materials, and service, and perform all work necessary to complete any additional work specified for the consideration stated herein. Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650 et seq. It is understood that the changes herein to the Contract shall only be effective when approved by the governing board of the District.

It is expressly understood that the value of the extra Work or changes expressly includes any and all of the Contractor's costs and expenses, direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project including, without limitation, cumulative impacts. Contractor is not entitled to separately recover amounts for overhead or other indirect costs. Any costs, expenses, damages, or time extensions not included are deemed waived.

SUBMITTED BY:

Contractor:

_____ _____

[Name] Date

END OF DOCUMENT

DOCUMENT 00 63 63

CHANGE ORDER FORM

Sacramento City Unified School District
5735 47th Avenue
Sacramento, CA 95824

CHANGE ORDER NO.:

CHANGE ORDER

Project: Luther Burbank HS Core Academic Renovation Phase #2
Bid No.: #0530-434

Date: _____
DSA File No.: _____
DSA Appl. No.:_____

The following parties agree to the terms of this Change Order:

Owner: _____
[Name / Address]
_____
_____

Contractor: _____
[Name / Address]
_____
_____

Architect: _____
[Name / Address]
_____
_____

Project Inspector: _____
[Name / Address]
_____
_____

Reference	**Description**	**Cost**	**Days Ext.**
PCO # Requested by: Performed by: Reason:	[Description of change] [Requester] [Performer] [Reason]	$	
PCO # Requested by: Performed by: Reason:	[Description of change] [Requester] [Performer] [Reason]	$	
PCO # Requested by: Performed by: Reason:	[Description of change] [Requester] [Performer] [Reason]	$	

Contract time will be adjusted as follows: Previous Completion Date: [Date] _____[#] Calendar Days Extension (zero unless otherwise indicated) Current Completion Date: [Date]	Original Contract Amount:	$
	Amount of Previously Approved Change Order(s):	$
	Amount of this Change Order:	$
	Contract Amount:	$

The undersigned Contractor approves the foregoing as to the changes, if any, to the Contract Price specified for each item, and as to the extension of time allowed, if any, for completion of the entire work as stated therein, and agrees to furnish all labor, materials

and services and perform all work necessary to complete any additional work specified for the consideration stated therein. Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650 et seq.

This change order is subject to approval by the governing board of this District and must be signed by the District. Until such time as this change order is approved by the District's governing board and executed by a duly authorized District representative, this change order is not effective and not binding.

It is expressly understood that the compensation and time, if any, granted herein represent a full accord and satisfaction for any and all time and cost impacts of the items herein, and Contractor waives any and all further compensation or time extension based on the items herein. The value of the extra work or changes expressly includes any and all of the Contractor's costs and expenses, and its subcontractors, both direct and indirect, resulting from additional time required on the project or resulting from delay to the project including without limitation, cumulative impacts. Any costs, expenses, damages or time extensions not included are deemed waived.

Signatures:

District:		Contractor:	
[Name]	Date	[Name]	Date
Architect:		Project Inspector:	
[Name]	Date	[Name]	Date

END OF DOCUMENT

DOCUMENT 00 65 19.26

AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS

THIS AGREEMENT AND RELEASE OF CLAIMS ("Agreement and Release") IS MADE AND ENTERED INTO THIS _____ DAY OF _____, 20___ by and between the SACRAMENTO CITY UNIFIED SCHOOL DISTRICT ("District") and _____ _____ ("Contractor"), whose place of business is _____ _____.

RECITALS

WHEREAS, District and Contractor entered into PROJECT/CONTRACT NO.: _____ _____ ("Contract" or "Project") in the County of Sacramento, California; and

WHEREAS, the Work under the Contract was completed on _____, and a Notice of Completion was recorded with the County Recorder on _____.

NOW, THEREFORE, it is mutually agreed between District and Contractor as follows:

AGREEMENT AND RELEASE

46. Contractor will only be assessed liquidated damages as detailed below:

Original Contract Sum	$_____
Modified Contract Sum	$_____
Payment to Date	$_____
Liquidated Damages	$_____
Payment Due Contractor	$_____

47. Subject to the provisions hereof, District shall forthwith pay to Contractor the undisputed sum of _____ Dollars ($_____) under the Contract, less any amounts represented by any notice to withhold funds on file with District as of the date of such payment.

48. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against District arising from the performance of work under the Contract, except for the claims described in Paragraph 4 and continuing obligations described in Paragraph 6. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against District and all of its respective agents, employees, trustees, inspectors, assignees, consultants and transferees, except for any Disputed Claim that may be set forth in Paragraph 4 and the continuing obligations described in Paragraph 6 hereof.

49. The following claims are disputed (hereinafter, the "Disputed Claims") and are specifically excluded from the operation of this Agreement and Release:

Claim No.	Description of Claim	Amount of Claim	Date Claim Submitted
_____	_____	$_____	_____
_____	_____	$_____	_____
_____	_____	$_____	_____
_____	_____	$_____	_____
_____	_____	$_____	_____
_____	_____	$_____	_____

[If further space is required, attach additional sheets showing the required information.]

50. Consistent with California Public Contract Code section 7100, Contractor hereby agrees that, in consideration of the payment set forth in Paragraph 2 hereof, Contractor hereby releases and forever discharges District, all its agents, employees, inspectors, assignees, and transferees from any and all liability, claims, demands, actions, or causes of action of whatever kind or nature arising out of or in any way concerned with the Work under the Contract.

51. Guarantees and warranties for the Work, and any other continuing obligation of Contractor, including without limitation, the duty to defend, indemnify and hold harmless the District, shall remain in full force and effect as specified in the Contract Documents.

52. Contractor hereby waives the provisions of California Civil Code section 1542 which provides as follows:

> A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS THAT THE CREDITOR OR RELEASING PARTY DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE AND THAT, IF KNOWN BY HIM OR HER, WOULD HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR OR RELEASED PARTY.

53. The provisions of this Agreement and Release are contractual in nature and not mere recitals and shall be considered independent and severable. If any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, county, municipal, or other law, ruling, or regulations, then such provision, or part thereof, shall remain in force and effect to the extent permitted by law, and the remaining provisions of this Agreement and Release shall also remain in full force and effect, and shall be enforceable.

54. All rights of District shall survive completion of the Work or termination of Contract, and execution of this Release.

* * * CAUTION: THIS IS A RELEASE - READ BEFORE EXECUTING * * *

SACRAMENTO CITY UNIFIED SCHOOL DISTRICT

Signature: _____

Print Name: _____

Title: _____

CONTRACTOR: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 65 36

GUARANTEE FORM

_____ ("Contractor") hereby agrees that the _____ _____ ("Work" of Contractor) which Contractor has installed for the Sacramento City Unified School District ("District") for the following project:

PROJECT: **Luther Burbank HS Core Academic Renovation Phase #2**, **#0530-434**

("Project" or "Contract") has been performed in accordance with the requirements of the Contract Documents and that the Work as installed will fulfill the requirements of the Contract Documents.

The undersigned agrees to repair or replace any or all of such Work that may prove to be defective in workmanship or material together with any other adjacent Work that may be displaced in connection with such replacement within a period of One year(s) from the date of completion as defined in Public Contract Code section 7107, subdivision (c), ordinary wear and tear and unusual abuse or neglect excepted. The date of completion is _____, 20___.

In the event of the undersigned's failure to comply with the above-mentioned conditions within a reasonable period of time, as determined by the District, but not later than seven (7) days after being notified in writing by the District, the undersigned authorizes the District to proceed to have said defects repaired and made good at the expense of the undersigned. The undersigned shall pay the costs and charges therefor upon demand.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

Representatives to be contacted for service subject to terms of Contract:

Name: _____

Address: _____

Phone No.: _____

Email: _____

END OF DOCUMENT

DOCUMENT 00 72 13

TABLE OF CONTENTS

DOCUMENT 00 72 13

GENERAL CONDITIONS

2. CONTRACT TERMS AND DEFINITIONS

2.1 Definitions

Wherever used in the Contract Documents, the following terms shall have the meanings indicated, which shall be applicable to both the singular and plural thereof:

2.1.1 Adverse Weather: Shall be only weather that satisfies all of the following conditions: (1) unusually severe precipitation, sleet, snow, hail, or extreme temperature conditions in excess of the norm for the location and time of year it occurred based on the closest weather station data averaged over the past five years, (2) that is unanticipated and would cause unsafe work conditions and/or is unsuitable for scheduled work that should not be performed during inclement weather (i.e., exterior finishes), and (3) at the Project.

2.1.2 Allowance Expenditure Directive: Written authorization for expenditure of allowance, if any.

2.1.3 Approval, Approved, and/or Accepted: Written authorization, unless stated otherwise.

2.1.4 Architect (or "Design Professional in General Responsible Charge"): The individual, partnership, corporation, joint venture, or any combination thereof, named as Architect, who will have the rights and authority assigned to the Architect in the Contract Documents. The term Architect means the Design Professional in General Responsible Charge as defined in DSA PR 13-02 on this Project or the Architect's authorized representative.

2.1.5 As-Builts: Reproducible blue line prints of drawings to be prepared on a monthly basis pursuant to the Contract Documents, that reflect changes made during the performance of the Work, recording differences between the original design of the Work and the Work as constructed since the preceding monthly submittal. See **Record Drawings**.

2.1.6 Bidder: A contractor who intends to provide a proposal to the District to perform the Work of this Contract.

2.1.7 Burdened: The labor rate for Contractor or any Subcontractor inclusive of any and all burden costs including, but not limited to, health and welfare pay, vacation and holiday pay, pension contributions, training rates, benefits of any kind, insurance of any kind, workers' compensation, liability insurance, truck expenses, supply expenses of any kind, payroll taxes, and any other taxes of any kind.

2.1.8 Change Order: A written order to the Contractor authorizing an addition to, deletion from, or revision in the Work, and/or authorizing an adjustment in the Contract Price or Contract Time.

2.1.9 Claim: A Dispute that remains unresolved at the conclusion of the all the applicable Dispute Resolution requirements provided herein.

2.1.10 Construction Change Directive: A written order prepared and issued by the District, the Construction Manager, and/or the Architect and signed by the District and the Architect, directing a change in the Work.

2.1.11 Construction Manager: The individual, partnership, corporation, joint venture, or any combination thereof, or its authorized representative, named as such by the District. If no Construction Manager is used on the Project that is the subject of this Contract, then all references to Construction Manager herein shall be read to refer to District.

2.1.12 Construction Schedule: The progress schedule of construction of the Project as provided by Contractor and approved by District.

2.1.13 Contract, Contract Documents: The Contract consists exclusively of the documents evidencing the agreement of the District and Contractor, identified as the Contract Documents. The Contract Documents consist of the following documents:

2.1.13.1 Notice to Bidders
2.1.13.2 Instructions to Bidders
2.1.13.3 Bid Form and Proposal
2.1.13.4 Bid Bond
2.1.13.5 Designated Subcontractors List
2.1.13.6 Site Visit Certification (if a site visit was required)
2.1.13.7 Non-Collusion Declaration
2.1.13.8 Notice of Award
2.1.13.9 Notice to Proceed
2.1.13.10 Agreement
2.1.13.11 Escrow of Bid Documentation
2.1.13.12 Escrow Agreement for Security Deposits in Lieu of Retention (if applicable)
2.1.13.13 Performance Bond
2.1.13.14 Payment Bond (Contractor's Labor & Material Bond)
2.1.13.15 General Conditions
2.1.13.16 Special Conditions (if applicable)
2.1.13.17 Project Labor Agreement (if applicable)
2.1.13.18 Hazardous Materials Procedures and Requirements
2.1.13.19 Workers' Compensation Certification
2.1.13.20 Prevailing Wage Certification
2.1.13.21 Disabled Veteran Business Enterprise Participation Certification (if applicable)
2.1.13.22 Drug-Free Workplace Certification (if applicable)
2.1.13.23 Tobacco-Free Environment Certification
2.1.13.24 Hazardous Materials Certification (if applicable)
2.1.13.25 Lead-Based Materials Certification (if applicable)
2.1.13.26 Imported Materials Certification (if applicable)
2.1.13.27 Criminal Background Investigation/Fingerprinting Certification
2.1.13.28 Buy American Certification (if certain federal funds used)
2.1.13.29 Roofing Project Certification (if applicable)
2.1.13.30 Registered Subcontractors List

2.1.13.31 Iran Contracting Act Certification (if applicable)
2.1.13.32 COVID-19 Vaccination/Testing Certification
2.1.13.33 Federal Debarment Certification (if applicable)
2.1.13.34 Federal Byrd Anti-Lobbying Certification (if applicable)
2.1.13.35 Post Bid Interview
2.1.13.36 All Plans, Technical Specifications, and Drawings
2.1.13.37 Any and all addenda to any of the above documents
2.1.13.38 Any and all change orders or written modifications to the above documents if approved in writing by the District

2.1.14 Contract Price: The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

2.1.15 Contract Time: The time period stated in the Agreement for the completion of the Work.

2.1.16 Contractor: The person or persons identified in the Agreement as contracting to perform the Work to be done under this Contract, or the legal representative of such a person or persons.

2.1.17 Daily Job Report(s): Daily Project reports prepared by the Contractor's employee(s) who are present on Site, which shall include the information required herein.

2.1.18 Day(s): Unless otherwise designated, day(s) means calendar day(s).

2.1.19 Department of Industrial Relations (or "DIR"): is responsible, among other things, for labor compliance monitoring and enforcement of California prevailing wage laws and regulations for public works contracts.

2.1.20 Design Professional in General Responsible Charge: See definition of **Architect** above.

2.1.21 Dispute: A separate demand by Contractor for a time extension, or payment of money or damages arising from Work done by or on behalf of the Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or Contractor is not otherwise entitled to; or an amount of payment disputed by the District.

2.1.22 District: The public agency or the school district for which the Work is performed. The governing board of the District or its designees will act for the District in all matters pertaining to the Contract. The District may, at any time,

2.1.22.1 Direct the Contractor to communicate with or provide notice to the Construction Manager or the Architect on matters for which the Contract Documents indicate the Contractor will communicate with or provide notice to the District; and/or

2.1.22.2 Direct the Construction Manager or the Architect to communicate with or direct the Contractor on matters for which the Contract Documents indicate the District will communicate with or direct the Contractor.

2.1.23 Drawings (or "Plans"): The graphic and pictorial portions of the Contract Documents showing the design, location, scope and dimensions of the work, generally including plans, elevations, sections, details, schedules, sequence of operation, and diagrams.

2.1.24 DSA: Division of the State Architect.

2.1.25 Force Account Directive: A process that may be used when the District and the Contractor cannot agree on a price for a specific portion of work or before the Contractor prepares a price for a specific portion of work and whereby the Contractor performs the work as indicated herein on a time and materials basis.

2.1.26 Job Cost Reports: Any and all reports or records detailing the costs associated with work performed on or related to the Project that Contractor shall maintain for the Project. Specifically, Job Cost Reports shall contain, but are not limited by or to, the following information: a description of the work performed or to be performed on the Project; quantity, if applicable, of work performed (hours, square feet, cubic yards, pounds, etc.) for the Project; Project budget; costs for the Project to date; estimated costs to complete the Project; and expected costs at completion. The Job Cost Reports shall also reflect all Contract cost codes, change orders, elements of non-conforming work, back charges, and additional services.

2.1.27 Labor Commissioner's Office (or "Labor Commissioner", also known as the Division of Labor Standards Enforcement ("DLSE")): Division of the DIR responsible for adjudicating wage claims, investigating discrimination and public works complaints, and enforcing Labor Code statutes and Industrial Welfare Commission orders.

2.1.28 Municipal Separate Storm Sewer System (or "MS4"): A system of conveyances used to collect and/or convey storm water, including, without limitation, catch basins, curbs, gutters, ditches, man-made channels, and storm drains.

2.1.29 Plans: See **Drawings**.

2.1.30 Premises: The real property owned by the District on which the Site is located.

2.1.31 Product(s): New material, machinery, components, equipment, fixtures and systems forming the Work, including existing materials or components required and approved by the District for reuse.

2.1.32 Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the Work.

2.1.33 Program Manager: The individual, partnership, corporation, joint venture, or any combination thereof, or its authorized representative, named as such by the District. If no Program Manager is designated for Project that is the subject of this Contract, then all references to Project Manager herein shall be read to refer to District.

2.1.34 Project: The planned undertaking as provided for in the Contract Documents.

2.1.35 Project Inspector (or "Inspector"): The individual(s) retained by the District in accordance with title 24 of the California Code of Regulations to monitor and inspect the Project.

2.1.36 Project Labor Agreement (or "PLA"): a prehire collective bargaining agreement in accordance with Public Contract Code section 2500 et seq. that establishes terms and conditions of employment for a specific construction project or projects and/or is an agreement described in Section 158(f) of Title 29 of the United States Code.

2.1.37 Proposed Change Order (or "PCO"): a written request prepared by the Contractor requesting that the District and the Architect issue a Change Order based upon a proposed change to the Work.

2.1.38 Provide: Shall include "provide complete in place," that is, "furnish and install," and "provide complete and functioning as intended in place" unless specifically stated otherwise.

2.1.39 Qualified SWPPP Practitioners (or "QSP"): certified personnel that attended a State Water Resources Control Board sponsored or approved training class and passed the qualifying exam.

2.1.40 Record Drawings: Reproducible drawings (or Plans) prepared pursuant to the requirements of the Contract Documents that reflect all changes made during the performance of the Work, recording differences between the original design of the Work and the Work as constructed upon completion of the Project. See also **As-Builts**.

2.1.41 Request for Information (or "RFI"): A written request prepared by the Contractor requesting that the Architect provide additional information necessary to clarify or amplify an item in the Contract Documents that the Contractor believes is not clearly shown or called for in the Drawings or Specifications or other portions of the Contract Documents, or to address problems that have arisen under field conditions.

2.1.42 Request for Substitution for Specified Item: A request by Contractor to substitute an equal or superior material, product, thing, or service for a specific material, product, thing, or service that has been designated in the Contract Documents by a specific brand or trade name.

2.1.43 Safety Orders: Written and/or verbal orders for construction issued by the California Division of Occupational Safety and Health ("CalOSHA") or by the United States Occupational Safety and Health Administration ("OSHA").

2.1.44 Safety Plan: Contractor's safety plan specifically adapted for the Project. Contractor's Safety Plan shall comply with all provisions regarding Project safety, including all applicable provisions in these General Conditions.

2.1.45 Samples: Physical examples that illustrate materials, products, equipment, finishes, colors, or workmanship and that, when approved in accordance with the Contract Documents, establish standards by which portions of the Work will be judged.

2.1.46 Shop Drawings: All drawings, prints, diagrams, illustrations, brochures, schedules, and other data that are prepared by the Contractor, a subcontractor, manufacturer, supplier, or distributor, that illustrate how specific portions of the Work shall be fabricated or installed.

2.1.47 Site: The Project site as shown on the Drawings.

2.1.48 Specifications: That portion of the Contract Documents, Division 1 through Division 49, and all technical sections, and addenda to all of these, if any, consisting of written descriptions and requirements of a technical nature of materials, equipment, construction methods and systems, standards, and workmanship.

2.1.49 State: The State of California.

2.1.50 Storm Water Pollution Prevention Plan (or "SWPPP"): A document which identifies sources and activities at a particular facility that may contribute pollutants to storm water and contains specific control measures and time frames to prevent or treat such pollutants.

2.1.51 Subcontractor: A contractor and/or supplier who is under contract with the Contractor or with any other subcontractor, regardless of tier, to perform a portion of the Work of the Project.

2.1.52 Submittal Schedule: The schedule of submittals as provided by Contractor and approved by District.

2.1.53 Surety: The person, firm, or corporation that executes as surety the Contractor's Performance Bond and Payment Bond, and must be a California admitted surety insurer as defined in the Code of Civil Procedure section 995.120.

2.1.54 Work: All labor, materials, equipment, components, appliances, supervision, coordination, and services required by, or reasonably inferred from, the Contract Documents, that are necessary for the construction and completion of the Project.

2.2 Laws Concerning the Contract

Contract is subject to all provisions of the Constitution and laws of California and the United States governing, controlling, or affecting District, or the property, funds, operations, or powers of District, and such provisions are by this reference made a part hereof. Any provision required by law to be included in this Contract shall be deemed to be inserted.

2.3 No Oral Agreements

No oral agreement or conversation with any officer, agent, or employee of District, either before or after execution of Contract, shall affect or modify any of the terms or obligations contained in any of the documents comprising the Contract.

2.4 No Assignment

Contractor shall not assign this Contract or any part thereof including, without limitation, any Work or money to become due hereunder without the prior written consent of the District. Assignment without District's prior written consent shall be null and void. Any assignment of money due or to become due under this Contract shall be subject to a prior lien for services rendered or material supplied for performance of work called for under this Contract in favor of all persons, firms, or corporations rendering services or supplying material to the extent that

claims are filed pursuant to the Civil Code, Code of Civil Procedure, Government Code, Labor Code, and/or Public Contract Code, and shall also be subject to deductions for liquidated damages or withholding of payments as determined by District in accordance with this Contract. Contractor shall not assign or transfer in any manner to a Subcontractor or supplier the right to prosecute or maintain an action against the District.

2.5 Notice and Service Thereof

2.5.1 Any notice from one party to the other or otherwise under Contract shall be in writing and shall be dated and signed by the party giving notice or by a duly authorized representative of that party. Any notice shall not be effective for any purpose whatsoever unless served in one of the following manners:

2.5.1.1 If notice is given by personal delivery thereof, it shall be considered delivered on the day of delivery.

2.5.1.2 If notice is given by overnight delivery service, it shall be considered delivered one (1) day after date deposited, as indicated by the delivery service.

2.5.1.3 If notice is given by depositing same in United States mail, enclosed in a sealed envelope, it shall be considered delivered three (3) days after date deposited, as indicated by the postmarked date.

2.5.1.4 If notice is given by registered or certified mail with postage prepaid, return receipt requested, it shall be considered delivered on the day the notice is signed for.

2.5.1.5 Electronic mail may be used for convenience but is not a substitute for the notice and service requirements herein.

2.6 No Waiver

The failure of District in any one or more instances to insist upon strict performance of any of the terms of this Contract or to exercise any option herein conferred shall not be construed as a waiver or relinquishment to any extent of the right to assert or rely upon any such terms or option on any future occasion. No action or failure to act by the District, Architect, or Construction Manager shall constitute a waiver of any right or duty afforded the District under the Contract, nor shall any action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

2.7 Substitutions for Specified Items

Unless the Special Conditions contain different provisions, Contractor shall not substitute different items for any items identified in the Contract Documents without prior written approval of the District.

2.8 Materials and Work

2.8.1 Except as otherwise specifically stated in this Contract, Contractor shall provide and pay for all materials, labor, tools, equipment, transportation, supervision, temporary constructions of every nature, and all other services, management, and facilities of every nature whatsoever necessary to execute and complete this Contract, in a good and workmanlike manner, within the Contract Time.

2.8.2 Unless otherwise specified, all materials shall be new and of the best quality of their respective kinds and grades as noted or specified, workmanship shall

be of good quality, and Contractor shall use all diligence to inform itself fully as to the required manufacturer's instructions and to comply therewith.

2.8.3 Materials shall be furnished in ample quantities and at such times as to insure uninterrupted progress of Work and shall be stored properly and protected from the elements, theft, vandalism, or other loss or damage as required.

2.8.4 For all materials and equipment specified or indicated in the Drawings, the Contractor shall provide all labor, materials, equipment, and services necessary for complete assemblies and complete working systems, functioning as intended. Incidental items not indicated on Drawings, nor mentioned in the Specifications, that can legitimately and reasonably be inferred to belong to the Work described, or be necessary in good practice to provide a complete assembly or system, shall be furnished as though itemized here in every detail. In all instances, material and equipment shall be installed in strict accordance with each manufacturer's most recent published recommendations and specifications.

2.8.5 Contractor shall, after award of Contract by District and after relevant submittals have been reviewed, place orders for materials and/or equipment as specified so that delivery of same may be made without delays to the Work. Contractor shall, upon five (5) days' demand from District, present documentary evidence showing that orders have been placed.

2.8.6 District reserves the right but has no obligation, in response to Contractor's neglect or failure in complying with the above instructions, to place orders for such materials and/or equipment as the District may deem advisable in order that the Work may be completed at the date specified in the Contract, and all expenses incidental to the procuring of said materials and/or equipment shall be paid for by Contractor or deducted from payment(s) to Contractor.

2.8.7 Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver the Site to District, together with all improvements and appurtenances constructed or placed thereon by it, and free from any claims, liens, or charges. Contractor further agrees that neither it nor any person, firm, or corporation furnishing any materials or labor for any work covered by the Contract shall have any right to lien any portion of the Premises or any improvement or appurtenance thereon, except that Contractor may install metering devices or other equipment of utility companies or of political subdivision, title to which is commonly retained by utility company or political subdivision. In the event of installation of any such metering device or equipment, Contractor shall advise District as to owner thereof.

2.8.7.1 If a lien or a claim based on a stop payment notice of any nature should at any time be filed against the Work or any District property, by any entity that has supplied material or services at the request of the Contractor, Contractor and Contractor's Surety shall promptly, on demand by District and at Contractor's and Surety's own expense, take any and all action necessary to cause any such lien or a claim based on a stop payment notice to be released or discharged immediately therefrom.

2.8.7.2 If the Contractor fails to furnish to the District within ten (10) calendar days after demand by the District, satisfactory evidence that a lien or a claim based on a stop payment notice has been so released, discharged, or secured,

the District may discharge such indebtedness and deduct the amount required therefor, together with any and all losses, costs, damages, and attorney's fees and expense incurred or suffered by District from any sum payable to Contractor under the Contract.

2.8.8 Nothing contained in this Article, however, shall defeat or impair the rights of persons furnishing materials or labor under any bond given by Contractor for their protection or any rights under any law permitting such protection or any rights under any law permitting such persons to look to funds due Contractor in hands of District (e.g., stop payment notices), and this provision shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing material for work when no formal contract is entered into for such material.

2.8.9 Title to new materials and/or equipment for the Work of this Contract and attendant liability for its protection and safety shall remain with Contractor until incorporated in the Work of this Contract and accepted by District. No part of any materials and/or equipment shall be removed from its place of storage except for immediate installation in the Work of this Contract. Should the District, in its discretion, allow the Contractor to store materials and/or equipment for the Work off-site, Contractor will store said materials and/or equipment at a bonded warehouse and with appropriate insurance coverage at no cost to District. Contractor shall keep an accurate inventory of all materials and/or equipment in a manner satisfactory to District or its authorized representative and shall, at the District's request, forward it to the District.

2.8.10 [RESERVED]

3. [RESERVED]

4. ARCHITECT

4.1 The Architect shall represent the District during the Project and will observe the progress and quality of the Work on behalf of the District. Architect shall have the authority to act on behalf of District to the extent expressly provided in the Contract Documents and to the extent determined by District. Architect shall have authority to reject materials, workmanship, and/or the Work whenever rejection may be necessary, in Architect's reasonable opinion, to ensure the proper execution of the Contract.

4.2 Architect shall, with the District and on behalf of the District, determine the amount, quality, acceptability, and fitness of all parts of the Work, and interpret the Specifications, Drawings, and shall, with the District, interpret all other Contract Documents.

4.3 Architect shall have all authority and responsibility established by law, including title 24 of the California Code of Regulations.

4.4 Contractor shall provide District and the Construction Manager with a copy of all written communication between Contractor and Architect at the same time as that communication is made to Architect, including, without limitation, all RFIs, correspondence, submittals, claims, and proposed change orders.

5. CONSTRUCTION MANAGER

5.1 If a Construction Manager is used on this Project ("Construction Manager" or "CM"), the Construction Manager will provide administration of the Contract on the District's behalf. After execution of the Contract and Notice to Proceed, all correspondence and/or instructions from Contractor and/or District shall be forwarded through the Construction Manager. The Construction Manager will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences, or procedures or for safety precautions in connection with the Work, which shall all remain the Contractor's responsibility.

5.2 The Construction Manager, however, will have authority to reject materials and/or workmanship not conforming to the Contract Documents, as determined by the District, the Architect, and/or the Project Inspector. The Construction Manager shall also have the authority to require special inspection or testing of any portion of the Work, whether it has been fabricated, installed, or fully completed. Any decision made by the Construction Manager, in good faith, shall not give rise to any duty or responsibility of the Construction Manager to: the Contractor; any Subcontractor; the Contractor or Subcontractor's respective agents, employees; or other persons performing any of the Work. The Construction Manager shall have free access to any or all parts of Work at any time.

5.3 If the District does not use a Construction Manager on this Project, all references within the Contract Documents to Construction Manager or CM shall be read as District.

6. INSPECTOR, INSPECTIONS, AND TESTS

6.1 Project Inspector

6.1.1 One or more Project Inspector(s), including special Project Inspector(s), as required, will be assigned to the Work by District, in accordance with requirements of title 24, part 1, of the California Code of Regulations, to enforce the building code and monitor compliance with Plans and Specifications for the Project previously approved by the DSA. Duties of Project Inspector(s) are specifically defined in section 4-342 of said part 1 of title 24.

6.1.2 No Work shall be carried on except with the knowledge and under the inspection of the Project Inspector(s). The Project Inspector(s) shall have free access to any or all parts of Work at any time. Contractor shall furnish Project Inspector(s) reasonable opportunities for obtaining such information as may be necessary to keep Project Inspector(s) fully informed respecting progress and manner of work and character of materials, including, but not limited to, submission of form DSA 156 (or the most current version applicable at the time the Work is performed) to the Project Inspector at least 48 hours in advance of the commencement and completion of construction of each and every aspect of the Work. Forms are available on the DSA's website at: http://www.dgs.ca.gov/dsa/Forms.aspx. Inspection of Work shall not relieve Contractor from an obligation to fulfill this Contract. Project Inspector(s) and the DSA are authorized to suspend work whenever the Contractor and/or its Subcontractor(s) are not complying with the Contract Documents. Any work stoppage by the Project Inspector(s) and/or DSA shall be without liability to the District. Contractor shall instruct its Subcontractors and employees accordingly.

6.1.3 If Contractor and/or any Subcontractor requests that the Project Inspector(s) perform any inspection off-site, this shall only be done if it is allowable pursuant to applicable regulations and DSA approval, if the Project Inspector(s) agree to do so, and at the expense of the Contractor.

6.2 Tests and Inspections

6.2.1 Tests and Inspections shall comply with title 24, part 1, California Code of Regulations, group 1, article 5, section 4-335, and with the provisions of the Specifications.

6.2.2 The District will select an independent testing laboratory to conduct the tests. Selection of the materials required to be tested shall be by the laboratory or the District's representative and not by the Contractor. The Contractor shall notify the District's representative a sufficient time in advance of its readiness for required observation or inspection.

6.2.3 The Contractor shall notify the District's representative a sufficient time in advance of the manufacture of material to be supplied under the Contract Documents, which must by terms of the Contract Documents be tested, in order that the District may arrange for the testing of same at the source of supply. This notice shall be provided, at a minimum, seventy-two (72) hours prior to the manufacture of the material that needs to be tested.

6.2.4 Any material shipped by the Contractor from the source of supply prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said representative that such testing and inspection will not be required, shall not be incorporated into and/or onto the Project.

6.2.5 The District will select the testing laboratory and pay for the cost of all tests and inspections, excepting those inspections performed at Contractor's request and expense. Contractor shall reimburse the District for any and all laboratory costs or other testing costs for any materials found to be not in compliance with the Contract Documents. At the District's discretion, District may elect to deduct laboratory or other testing costs for noncompliant materials from the Contract Price, and such deduction shall not constitute a withholding.

6.3 Costs for After Hours and/or Off Site Inspections

If the Contractor performs Work outside the Inspector's regular working hours or requests the Inspector to perform inspections off Site, costs of any inspections required outside regular working hours or off Site shall be borne by the Contractor and may be invoiced to the Contractor by the District or the District may deduct those expenses from the next Progress Payment.

7. CONTRACTOR

Contractor shall construct and complete, in a good and workmanlike manner, the Work for the Contract Price including any adjustment(s) to the Contract Price pursuant to provisions herein regarding changes to the Contract Price. Except as otherwise noted, Contractor shall provide and pay for all labor, materials, equipment, permits (excluding DSA), fees, licenses, facilities, transportation, taxes, bonds and insurance, and services necessary for the proper execution and completion of the Work, except as indicated herein.

7.1 Status of Contractor

7.1.1 Contractor is and shall at all times be deemed to be an independent contractor and shall be wholly responsible for the manner in which it and its Subcontractors perform the services required of it by the Contract Documents. Nothing herein contained shall be construed as creating the relationship of employer

and employee, or principal and agent, between the District, or any of the District's employees or agents, and Contractor or any of Contractor's Subcontractors, agents or employees. Contractor assumes exclusively the responsibility for the acts of its agents, and employees as they relate to the services to be provided during the course and scope of their employment. Contractor, its Subcontractors, agents, and its employees shall not be entitled to any rights or privileges of District employees. District shall be permitted to monitor the Contractor's activities to determine compliance with the terms of this Contract.

7.1.2 As required by law, Contractor and all Subcontractors shall be properly licensed and regulated by the Contractors State License Board, 9821 Business Park Drive, Sacramento, California 95827, http://www.cslb.ca.gov.

7.1.3 As required by law, Contractor and all Subcontractors shall be properly registered as public works contractors by the Department of Industrial Relations at: https://efiling.dir.ca.gov/PWCR/ActionServlet?action=displayPWCRegistrationForm or current URL.

7.1.4 Contractor represents that Contractor and all Subcontractors shall not be presently debarred, suspended, proposed for disbarment, declared ineligible or excluded pursuant to either Labor Code section 1777.1 or Labor Code section 1777.7.

7.1.5 [RESERVED]

7.1.6 Contractor represents that it has no existing interest and will not acquire any interest, direct or indirect, which could conflict in any manner or degree with the performance of Work required under this Contract and that no person having any such interest shall be employed by Contractor.

7.1.7 [RESERVED]

7.1.8 If Contractor intends to make any change in the name or legal nature of the Contractor's entity, Contractor must first notify the District in writing prior to making any contemplated change. The District shall determine in writing if Contractor's intended change is permissible while performing this Contract.

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7.2 Project Inspection Card(s)

Contractor shall verify that forms DSA 152 (or the current version applicable at the time the Work is performed) are issued for the Project prior to the commencement of construction.

7.3 Contractor's Supervision

7.3.1 During progress of the Work, Contractor shall keep on the Premises, and at all other locations where any Work related to the Contract is being performed, an experienced and competent project manager and construction superintendent who are employees of the Contractor, to whom the District does not object and at least one of whom shall be fluent in English, written and verbal.

7.3.2 The project manager and construction superintendent shall both speak fluently the predominant language of the Contractor's employees.

7.3.3 Before commencing the Work herein, Contractor shall give written notice to District of the name of its project manager and construction superintendent. Neither the Contractor's project manager nor construction superintendent shall be changed except with prior written notice to District. If the Contractor's project manager and/or construction superintendent proves to be unsatisfactory to Contractor, or to District, any of the District's employees, agents, the Construction Manager, or the Architect, the unsatisfactory project manager and/or construction superintendent shall be replaced. However, Contractor shall notify District in writing before any change occurs, but no less than two (2) business days prior. Any replacement of the project manager and/or construction superintendent shall be made promptly and must be satisfactory to the District. The Contractor's project manager and construction superintendent shall each represent Contractor, and all directions given to Contractor's project manager and/or construction superintendent shall be as binding as if given to Contractor.

7.3.4 Contractor shall give efficient supervision to Work, using its best skill and attention. Contractor shall carefully study and compare all Contract Documents, Drawings, Specifications, and other instructions and shall at once report to District, Construction Manager, and Architect any error, inconsistency, or omission that Contractor or its employees and Subcontractors may discover, in writing, with a copy to District's Project Inspector(s). The Contractor shall have responsibility for discovery of errors, inconsistencies, or omissions.

7.4 Duty to Provide Fit Workers

7.4.1 Contractor and Subcontractor(s) shall at all times enforce strict discipline and good order among their employees and shall not employ or work any unfit person or anyone not skilled in work assigned to that person. It shall be the responsibility of Contractor to ensure compliance with this requirement. District may require Contractor to permanently remove unfit persons from Project Site.

7.4.2 Any person in the employ of Contractor or Subcontractor(s) whom District may deem incompetent or unfit shall be excluded from working on the Project and shall not again be employed on the Project except with the prior written consent of District.

7.4.3 The Contractor shall furnish labor that can work in harmony with all other elements of labor employed or to be employed in the Work.

7.4.4 Fingerprinting. Contractor shall comply with the provisions of Education Code section 45125.2 regarding the submission of employee fingerprints to the California Department of Justice and the completion of criminal background investigations of its employees, its subcontractor(s), and its subcontractors' employees. Contractor shall not permit any employee to have any contact with District pupils until such time as Contractor has verified in writing to the governing board of the District, (A) that such employee has not been convicted of a violent or serious felony, as defined in Education Code section 45122.1 and/or (B) that the prohibition does not apply to an employee as provided by Education Code section 45125.1(e)(2) or (3). Contractor shall fully complete and perform all tasks required pursuant to the Criminal Background Investigation/ Fingerprinting Certification.

7.5 Field Office

7.5.1 Contractor shall provide a temporary office on the Site for the District's use exclusively, during the term of the Contract.

7.6 Purchase of Materials and Equipment

The Contractor is required to order, obtain, and store materials and equipment sufficiently in advance of its Work at no additional cost or advance payment from District to assure that there will be no delays.

7.7 Documents on Work

7.7.1 Contractor shall at all times keep on the Site, or at another location as the District may authorize in writing, one legible copy of all Contract Documents, including Addenda and Change Orders, and Titles 19 and 24 of the California Code of Regulations, the specified edition(s) of the Uniform Building Code, all approved Drawings, Plans, Schedules, and Specifications, and all codes and documents referred to in the Specifications, and made part thereof. These documents shall be kept in good order and available to District, Construction Manager, Architect, Architect's representatives, the Project Inspector(s), and all authorities having jurisdiction. Contractor shall be acquainted with and comply with the provisions of these titles as they relate to this Project. (See particularly the duties of Contractor, Title 24, Part 1, California Code of Regulations, section 4-343.) Contractor shall also be acquainted with and comply with all California Code of Regulations provisions relating to conditions on this Project, particularly Titles 8 and 17. Contractor shall coordinate with Architect and Construction Manager and shall submit its verified report(s) according to the requirements of Title 24.

7.7.2 Daily Job Reports.

7.7.2.1 Contractor shall maintain, at a minimum, at least one (1) set of Daily Job Reports on the Project. These must be prepared by the Contractor's employee(s) who are present on Site, and must include, at a minimum, the following information:

7.7.2.1.1 A brief description of all Work performed on that day.
7.7.2.1.2 A summary of all other pertinent events and/or occurrences on that day.

7.7.2.1.3 The weather conditions on that day.

7.7.2.1.4 A list of all Subcontractor(s) working on that day, including DIR registration numbers.

7.7.2.1.5 A list of each Contractor employee working on that day and the total hours worked for each employee.

7.7.2.1.6 A complete list of all equipment on Site that day, whether in use or not.

7.7.2.1.7 A complete list of all materials, supplies, and equipment delivered on that day.

7.7.2.1.8 A complete list of all inspections and tests performed on that day.

7.7.2.2 Each day Contractor shall provide a copy of the previous day's Daily Job Report to the District or the Construction Manager.

7.8 Preservation of Records

Contractor shall maintain, and District shall have the right to inspect, Contractor's financial records for the Project, including, without limitation, Job Cost Reports for the Project in compliance with the criteria set forth herein. The District shall have the right to examine and audit all Daily Job Reports or other Project records of Contractor's project manager(s), project superintendent(s), and/or project foreperson(s), all certified payroll records and/or related documents including, without limitation, Job Cost Reports, payroll, payment, timekeeping and tracking documents; all books, estimates, records, contracts, documents, bid documents, bid cost data, subcontract job cost reports, and other data of the Contractor, any Subcontractor, and/or supplier, including computations and projections related to bidding, negotiating, pricing, or performing the Work or Contract modification, in order to evaluate the accuracy, completeness, and currency of the cost, manpower, coordination, supervision, or pricing data at no additional cost to the District. These documents may be duplicative and/or be in addition to any Bid Documents held in escrow by the District. The Contractor shall make available at its office at all reasonable times the materials described in this paragraph for the examination, audit, or reproduction until three (3) years after final payment under this Contract. Notwithstanding the provisions above, Contractor shall provide any records requested by any governmental agency, if available, after the time set forth above.

7.9 Integration of Work

7.9.1 Contractor shall do all cutting, fitting, patching, and preparation of Work as required to make its several parts come together properly, to fit it to receive or be received by work of other contractors, and to coordinate tolerances to various pieces of work, showing upon, or reasonably implied by, the Drawings and Specifications for the completed structure, and shall conform them as District and/or Architect may direct.

7.9.2 Contractor shall make its own layout of lines and elevations and shall be responsible for the accuracy of both Contractor's and Subcontractors' work resulting therefrom.

7.9.3 Contractor and all Subcontractors shall take all field dimensions required in performance of the Work, and shall verify all dimensions and conditions on the Site. All dimensions affecting proper fabrication and installation of all Work must be verified prior to fabrication by taking field measurements of the true conditions. If there are any discrepancies between dimensions in drawings and existing conditions which will affect the Work, Contractor shall bring such discrepancies to the attention of the District and Architect for adjustment before proceeding with the Work. In doing so, it is recognized that Contractor is not acting in the capacity of a licensed design professional, and that Contractor's examination is made in good faith to facilitate construction and does not create an affirmative responsibility of a design

professional to detect errors, omissions or inconsistencies in the Contract Documents or to ascertain compliance with applicable laws, building codes or regulations. However, nothing in this provision shall abrogate Contractor's responsibilities for discovering and reporting any error, inconsistency, or omission pursuant to the Contract within the Contractor's standard of care including, without limitation, any applicable laws, ordinance, rules, or regulations. Following receipt of written notice from Contractor, the District and/or Architect shall inform Contractor what action, if any, Contractor shall take with regard to such discrepancies.

7.9.4 All costs caused by noncompliant, defective, or delayed Work shall be borne by Contractor, inclusive of repair work. Schedule delays resulting from unauthorized work shall be Contractor's responsibility.

7.9.5 Contractor shall not endanger any work performed by it or anyone else by cutting, excavating, or otherwise altering work and shall not cut or alter work of any other contractor except with consent of District.

7.10 Notifications

7.10.1 Contractor shall notify the Architect and Project Inspector, in writing, of the commencement of construction of each and every aspect of the Work at least 48 hours in advance by submitting form DSA 156 (or the most current version applicable at the time the Work is performed) to the Project Inspector. Forms are available on the DSA's website at: http://www.dgs.ca.gov/dsa/Forms.aspx.

7.10.2 Contractor shall notify the Architect and Project Inspector, in writing, of the completion of construction of each and every aspect of the Work at least 48 hours in advance by submitting form DSA 156 (or current version) to the Project Inspector.

7.11 Obtaining of Permits, Licenses and Registrations

7.11.1 Contractor shall secure and pay for all permits (except DSA), licenses, registrations, approvals and certificates necessary for prosecution of Work, including but not limited to those listed in the Special Conditions, if any, before the date of the commencement of the Work or before the permits, licenses, registrations, approvals and certificates are legally required to continue the Work without interruption. The Contractor shall obtain and pay, only when legally required, for all licenses, registrations, approvals, permits, inspections, and inspection certificates required to be obtained from or issued by any authority having jurisdiction over any part of the Work included in the Contract. All final permits, licenses, registrations, approvals and certificates shall be delivered to District before demand is made for final payment.

7.11.2 General Permit For Storm Water Discharges Associated With Construction and Land Disturbance Activities.

7.11.2.1 Contractor acknowledges that all California school districts are obligated to develop and implement the following requirements for the discharge of storm water to surface waters from its construction and land disturbance activities pursuant to the Clean Water Act and Porter Cologne Water Quality Act. District has determined that the construction of this Project requires enrollment in the Construction Storm Water Permit. District has filed certain submittals

referred to as Permit Registration Documents ("PRDS") with the Regional Water Control Board ("Storm Water Pollution Prevention Plan" or "SWPPP").

7.11.2.2 Contractor shall comply with any District SWPPP that is approved by the District and applicable to the Project, at no additional cost to the District. Contractor shall pay any fees and any penalties that may imposed by a regulatory agency for its non-compliance with the SWPPP during the course of Work.

7.11.2.3 Contractor shall provide a Qualified Storm Water Practitioner ("QSP") at no additional cost to the District, who shall be onsite and implement and monitor any and all SWPPP requirements applicable to the Project, including but not limited to:

7.11.2.3.1 All required visual observations, sampling, analysis, reporting and record keeping, including any Numeric Action Levels ("NALs"), if applicable;

7.11.2.3.2 Rain Event Action Plan ("REAP") at least forty eight (48) hours prior to any forecasted rain event requiring implementation of the REAP, including any erosion and sediment control measures needed to protect all exposed portions of the site, if applicable;

7.11.2.3.3 Active Treatment System ("ATS"), if applicable; and

7.11.2.3.4 Best management practices ("BMPs").

7.12 Royalties and Patents

7.12.1 Contractor shall obtain and pay, only when legally required, all royalties and license fees necessary for prosecution of Work before the earlier of the date of the commencement of the Work or the date that the license is legally required to continue the Work without interruption. Contractor shall defend suits or claims of infringement of patent, copyright, or other rights and shall hold the District, the Architect, and the Construction Manager harmless and indemnify them from loss on account thereof except when a particular design, process, or make or model of product is required by the Contract Documents. However, if the Contractor has reason to believe that the required design, process, or product is an infringement of a patent or copyright, the Contractor shall indemnify and defend the District, Architect and Construction Manager against any loss or damage unless the Contractor promptly informs the District of its information.

7.12.2 The review by the District or Architect of any method of construction, invention, appliance, process, article, device, or material of any kind shall be only its adequacy for the Work and shall not approve use by the Contractor in violation of any patent or other rights of any person or entity.

7.13 Work to Comply With Applicable Laws and Regulations

7.13.1 Contractor shall give all notices and comply with the following specific laws, ordinances, rules, and regulations and all other applicable laws, ordinances, rules, and regulations bearing on conduct of Work as indicated and specified, including but not limited to the appropriate statutes and administrative code

sections. If Contractor observes that Drawings and Specifications are at variance therewith, or should Contractor become aware of the development of conditions not covered by Contract Documents that may result in finished Work being at variance therewith, Contractor shall promptly notify District in writing and any changes deemed necessary by District shall be made as provided in Contract for changes in Work.

7.13.1.1 National Electrical Safety Code, U. S. Department of Commerce

7.13.1.2 National Board of Fire Underwriters' Regulations

7.13.1.3 International Building Code, latest addition, and the California Code of Regulations, title 24, and other amendments

7.13.1.4 Manual of Accident Prevention in Construction, latest edition, published by A.G.C. of America

7.13.1.5 Industrial Accident Commission's Safety Orders, State of California

7.13.1.6 Regulations of the State Fire Marshall (title 19, California Code of Regulations) and Pertinent Local Fire Safety Codes

7.13.1.7 Americans with Disabilities Act

7.13.1.8 Education Code of the State of California

7.13.1.9 Government Code of the State of California

7.13.1.10 Labor Code of the State of California, division 2, part 7, Public Works and Public Agencies

7.13.1.11 Public Contract Code of the State of California

7.13.1.12 California Art Preservation Act

7.13.1.13 U. S. Copyright Act

7.13.1.14 U. S. Visual Artists Rights Act

7.13.2 Contractor shall comply with all applicable mitigation measures, if any, adopted by any public agency with respect to this Project pursuant to the California Environmental Quality Act (Public Resources Code section 21000 et seq.).

7.13.3 If Contractor performs any Work that it knew, or through exercise of reasonable care should have known, to be contrary to any applicable laws, ordinance, rules, or regulations, Contractor shall bear all costs arising therefrom and arising from the correction of said Work.

7.13.4 Where Specifications or Drawings state that materials, processes, or procedures must be approved by the DSA, State Fire Marshall, or other body or agency, Contractor shall be responsible for satisfying requirements of such bodies or agencies applicable at the time the Work is performed, and as determined by those bodies or agencies.

7.13.5 [RESERVED]

7.14 Safety/Protection of Persons and Property

7.14.1 The Contractor will be solely and completely responsible for conditions of the Site, including safety of all persons and property during performance of the Work. This requirement will apply continuously and not be limited to normal working hours.

7.14.2 The wearing of hard hats will be mandatory at all times for all personnel on Site. Contractor shall supply sufficient hard hats to properly equip all employees and visitors.

7.14.3 Any construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the Site.

7.14.4 Implementation and maintenance of safety programs shall be the sole responsibility of the Contractor.

7.14.5 The Contractor shall furnish to the District a copy of the Contractor's safety plan within the time frame indicated in the Contract Documents and specifically adapted for the Project.

7.14.6 Contractor shall be responsible for all damages to persons or property that occur as a result of its fault or negligence in connection with the prosecution of this Contract and shall take all necessary measures and be responsible for the proper care and completion and final acceptance by District. All Work shall be solely at Contractor's risk with the exception of damage to the Work caused by "acts of God" as defined in Public Contract Code section 7105.

7.14.7 Contractor shall take, and require Subcontractors to take, all necessary precautions for safety of workers on the Project and shall comply with all applicable federal, state, local, and other safety laws, standards, orders, rules, regulations, and building codes to prevent accidents or injury to persons on, about, or adjacent to premises where Work is being performed and to provide a safe and healthful place of employment. Contractor shall furnish, erect, and properly maintain at all times, all necessary safety devices, safeguards, construction canopies, signs, nets, barriers, lights, and watchmen for protection of workers and the public and shall post danger signs warning against hazards created by such features in the course of construction.

7.14.8 Hazards Control – Contractor shall store volatile wastes in covered metal containers and remove them from the Site daily. Contractor shall prevent accumulation of wastes that create hazardous conditions. Contractor shall provide adequate ventilation during use of volatile or noxious substances.

7.14.9 Contractor shall designate a responsible member of its organization on the Project, whose duty shall be to post information regarding protection and obligations of workers and other notices required under occupational safety and health laws, to comply with reporting and other occupational safety requirements, and to protect the life, safety, and health of workers. Name and position of person so designated shall be reported to District by Contractor.

7.14.10 Contractor shall correct any violations of safety laws, rules, orders, standards, or regulations. Upon the issuance of a citation or notice of violation by the Division of Occupational Safety and Health, Contractor shall correct such violation promptly.

7.14.11 Contractor shall comply with any District storm water requirements that are approved by the District and applicable to the Project, at no additional cost to the District.

7.14.12 In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization, shall act, at its discretion, to prevent such threatened loss or injury. Any compensation claimed by Contractor on account of emergency work shall be determined by agreement.

7.14.13 All salvage materials will become the property of the Contractor and shall be removed from the Site unless otherwise called for in the Contract Documents. However, the District reserves the right to designate certain items of value that shall be turned over to the District unless otherwise directed by District.

7.14.14 All connections to public utilities and/or existing on-site services, including, without limitation, internet, phone and data connections, shall be made and maintained in such a manner as to not interfere with the continuing use of same by the District during the entire progress of the Work.

7.14.15 Contractor shall provide such heat, covering, and enclosures as are necessary to protect all Work, materials, equipment, appliances, and tools against damage by weather conditions, such as extreme heat, cold, rain, snow, dry winds, flooding, or dampness.

7.14.16 The Contractor shall protect and preserve the Work from all damage or accident, providing any temporary roofs, window and door coverings, boxings, or other construction as required by the Architect. The Contractor shall be responsible for existing structures, walks, roads, trees, landscaping, and/or improvements in working areas; and shall provide adequate protection therefore. If temporary removal is necessary of any of the above items, or damage occurs due to the Work, the Contractor shall replace same at his expense with same kind, quality, and size of Work or item damaged. This shall include any adjoining property of the District and others.

7.14.17 Contractor shall take adequate precautions to protect existing roads, sidewalks, curbs, pavements, utilities, adjoining property, and structures (including, without limitation, protection from settlement or loss of lateral support), and to avoid damage thereto, and repair any damage thereto caused by construction operations.

7.14.18 Contractor shall confine apparatus, the storage of materials, and the operations of workers to limits indicated by law, ordinances, permits, or directions of Architect, and shall not interfere with the Work or unreasonably encumber Premises or overload any structure with materials. Contractor shall enforce all instructions of District and Architect regarding signs, advertising, fires, and smoking, and require that all workers comply with all regulations while on Project Site.

7.14.19 Contractor, Contractor's employees, Subcontractors, Subcontractors' employees, or any person associated with the Work shall conduct themselves in a

manner appropriate for a school site. No verbal or physical contact with neighbors, students, and faculty, profanity, or inappropriate attire and/or logos, or behavior will be permitted. District may require Contractor to temporarily or permanently remove non-complying persons from Project Site.

7.14.20 Contractor shall take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed, Contractor shall have a civil engineer, registered as a professional engineer in California, replace them at no cost to District.

7.14.21 In the event that the Contractor enters into any agreement with owners of any adjacent property to enter upon the adjacent property for the purpose of performing the Work, Contractor shall fully indemnify, defend, and hold harmless each person, entity, firm, or agency that owns or has any interest in adjacent property. The form and content of the agreement of indemnification shall be approved by the District prior to the commencement of any Work on or about the adjacent property. The Contractor shall also indemnify the District as provided in the indemnification provision herein. These provisions shall be in addition to any other requirements of the owners of the adjacent property.

7.15 Working Evenings and Weekends

Contractor may be required to work increased hours, evenings, and/or weekends at no additional cost to the District. Contractor shall give the District seventy-two (72) hours' notice prior to performing any evening and/or weekend work. Contractor shall perform all evening and/or weekend work only upon District's approval and in compliance with all applicable rules, regulations, laws, and local ordinances including, without limitation, all noise and light limitations. Contractor shall reimburse the District for any increased or additional Inspector charges as a result of Contractor's increased hours, or evening and/or weekend work.

7.16 Cleaning Up

7.16.1 The Contractor shall provide all services, labor, materials, and equipment necessary for protecting and securing the Work, all school occupants, furnishings, equipment, and building structure from damage until its completion and final acceptance by District. Dust barriers shall be provided to isolate dust and dirt from construction operations. At completion of the Work and portions thereof, Contractor shall clean to the original state any areas beyond the Work area that become dust laden as a result of the Work. The Contractor must erect the necessary warning signs and barricades to ensure the safety of all school occupants. The Contractor at all times must maintain good housekeeping practices to reduce the risk of fire damage and must make a fire extinguisher, fire blanket, and/or fire watch, as applicable, available at each location where cutting, braising, soldering, and/or welding is being performed or where there is an increased risk of fire.

7.16.2 Contractor at all times shall keep Premises, including property immediately adjacent thereto, free from debris such as waste, rubbish (including personal rubbish of workers, e.g., food wrappers, etc.), and excess materials and equipment caused by the Work. Contractor shall not leave debris under, in, or about the Premises (or surrounding property or neighborhood), but shall promptly remove same from the Premises on a daily basis. If Contractor fails to clean up, District may do so and the cost thereof shall be charged to Contractor. If Contract is for work on an existing facility, Contractor shall also perform specific clean-up on or about the Premises upon request by the District as it deems necessary for continued operations. Contractor shall comply with all related provisions of the Specifications.

7.16.3 If the Construction Manager, Architect, or District observes the accumulation of trash and debris, the District will give the Contractor a 24-hour written notice to mitigate the condition.

7.16.4 Should the Contractor fail to perform the required clean-up, or should the clean-up be deemed unsatisfactory by the District, the District may, at its sole discretion, then perform the clean-up. All cost associated with the clean-up work (including all travel, payroll burden, and costs for supervision) will be deducted from the Contract Price.

7.17 No Relief from Obligations Based on Review by Other Persons

7.17.1 Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents by act or omission of the District, Architect, Construction Manager, Project Inspector, or DSA or other entities having jurisdiction including, but not limited to, administration of the Contract, review of submittals, or by tests, observation, inspection, or permit/interconnection approvals.

8. SUBCONTRACTORS

8.1 Contractor shall provide the District with information for all Subcontracts as indicated in the Contractor's Submittals and Schedules Section herein.

8.2 No contractual relationship exists between the District and any Subcontractor, supplier, or sub-subcontractor by reason of this Contract.

8.3 Contractor agrees to bind every Subcontractor by terms of this Contract as far as those terms that are applicable to Subcontractor's work including, without limitation, all labor, wage & hour, apprentice and related provisions and requirements. If Contractor shall subcontract any part of this Contract, Contractor shall be as fully responsible to District for acts and omissions of any Subcontractor and of persons either directly or indirectly employed by any Subcontractor, including Subcontractor caused Project delays, as it is for acts and omissions of persons directly employed by Contractor. The divisions or sections of the Specifications and/or the arrangement of the drawings are not intended to control the Contractor in dividing the Work among Subcontractors or limit the work performed by any trade.

8.4 District's consent to, or approval of, or failure to object to, any Subcontractor under this Contract shall not in any way relieve Contractor of any obligations under this Contract and no such consent shall be deemed to waive any provisions of this Contract.

8.5 Contractor is directed to familiarize itself with sections 4100 through 4114 of the Public Contract Code of the State of California, as regards subletting and subcontracting, and to comply with all applicable requirements therein. In addition, Contractor is directed to familiarize itself with sections 1720 through 1861 of the Labor Code of the State of California, as regards the payment of prevailing wages and related issues, and to comply with all applicable requirements therein including, without limitation, section 1775 and the Contractor's and Subcontractors' obligations and liability for violations of prevailing wage law and other applicable laws.

8.6 No Contractor whose Bid is accepted shall, without consent of the awarding authority and in full compliance with section 4100 et seq. of the Public Contract Code, including, without limitation, sections 4107, 4107.5, and 4109 of the Public Contract Code, and section 1771.1 of the Labor Code, either:

8.6.1 Substitute any person as a Subcontractor in place of the Subcontractor designated in the original Bid; or

8.6.2 Permit any Subcontract to be assigned or transferred, or allow any portion of the Work to be performed by anyone other than the original Subcontractor listed in the Bid; or

8.6.3 Sublet or subcontract any portion of the Work in excess of one-half of one percent (0.5%) of the Contractor's total bid as to which his original bid did not designate a Subcontractor.

8.7 The Contractor shall be responsible for the coordination of the trades, Subcontractors, sub-subcontractors, and material or equipment suppliers working on the Project.

8.7.1 If the Contract is valued at $1 million or more and uses, or plans to use, state bond funds, then Contractor is responsible for ensuring that first tier Subcontractors holding C-4, C-7, C-10, C-16, C-20, C-34, C-36, C-38, C-42, C-43, and/or C-46 licenses are prequalified by the District to work on the Project pursuant to Public Contract Code section 20111.6.

8.7.2 Contractor is responsible for ensuring that all Subcontractors are properly registered as public works contractors by the Department of Industrial Relations.

8.8 Contractor is solely responsible for settling any differences between the Contractor and its Subcontractor(s) or between Subcontractors.

8.9 Contractor must include in all of its subcontracts the assignment provisions as indicated in the Termination section of these General Conditions.

9. OTHER CONTRACTS/CONTRACTORS

9.1 District reserves the right to let other contracts, and/or to perform work with its own forces, in connection with the Project. Contractor shall afford other contractors reasonable opportunity for introduction and storage of their materials and execution of their work and shall properly coordinate and connect Contractor's Work with the work of other contractors.

9.2 In addition to Contractor's obligation to protect its own Work, Contractor shall protect the work of any other contractor that Contractor encounters while working on the Project.

9.3 If any part of Contractor's Work depends for proper execution or results upon work of District or any other contractor, the Contractor shall inspect and, before proceeding with its Work, promptly report to the District in writing any defects in District's or any other contractor's work that render Contractor's Work unsuitable for proper execution and results. Contractor shall be held accountable for damages to District for District's or any other contractor's work that Contractor failed to inspect or should have inspected. Contractor's failure to inspect and report shall constitute Contractor's acceptance of all District's or any other contractor's work as fit and proper for reception of Contractor's Work, except as to defects that may develop in District's or any other contractor's work after execution of Contractor's Work and not caused by execution of Contractor's Work.

9.4 To ensure proper execution of its subsequent work, Contractor shall measure and inspect work already in place and shall at once report to the District in writing any discrepancy between that executed work and the Contract Documents.

9.5 Contractor shall ascertain to its own satisfaction the scope of the Project and nature of District's or any other contracts that have been or may be awarded by District in prosecution of the Project to the end that Contractor may perform this Contract in light of the other contracts, if any.

9.6 Nothing herein contained shall be interpreted as granting to Contractor exclusive occupancy of the Site, the Premises, or of the Project. Contractor shall not cause any unnecessary hindrance or delay to the use and/or operation(s) of the Premises and/or to District or any other contractor working on the Project. If simultaneous execution of any contract or Premises operation is likely to cause interference with performance of Contractor's Contract, Contractor shall coordinate with those contractor(s), person(s), and/or entity(s) and shall notify the District of the resolution.

10. DRAWINGS AND SPECIFICATIONS

10.1 A complete list of all Drawings that form a part of the Contract is to be found as an index on the Drawings themselves, and/or may be provided to the Contractor and/or in the Table of Contents.

10.2 Materials or Work described in words that so applied have a well-known technical or trade meaning shall be deemed to refer to recognized standards, unless noted otherwise.

10.3 **Trade Name or Trade Term.** It is not the intention of this Contract to go into detailed descriptions of any materials and/or methods commonly known to the trade under "trade name" or "trade term." The mere mention or notation of "trade name" or "trade term" shall be considered a sufficient notice to Contractor that it will be required to complete the work so named, complete, finished, and operable, with all its appurtenances, according to the best practices of the trade.

10.4 The naming of any material and/or equipment shall mean furnishing and installing of same, including all incidental and accessory items thereto and/or labor therefor, as per best practices of the trade(s) involved, unless specifically noted otherwise.

10.5 Contract Documents are complementary, and what is called for by one shall be binding as if called for by all. As such, Drawings and Specifications are intended to be fully cooperative and to agree. However, if Contractor observes that Drawings and Specifications are in conflict with the Contract Documents, Contractor shall promptly notify District and Architect in writing, and any necessary changes shall be made as provided in the Contract Documents.

10.6 In the case of discrepancy or ambiguity in the Contract Documents, the order of precedence in the Agreement shall prevail. However, in the case of discrepancy or ambiguity solely between and among the Drawings and Specifications, the discrepancy or ambiguity shall be resolved in favor of the interpretation that will provide District with the functionally complete and operable Project described in the Drawings and Specifications. In case of ambiguity, conflict, or lack of information, District will furnish clarifications with reasonable promptness.

10.7 Drawings and Specifications are intended to comply with all laws, ordinances, rules, and regulations of constituted authorities having jurisdiction, and where referred to in the Contract Documents, the laws, ordinances, rules, and regulations shall be considered as a part of the Contract within the limits specified. Contractor shall bear all expense of correcting work done contrary to said laws, ordinances, rules, and regulations.

10.8 As required by Section 4-317(c), Part 1, Title 24, CCR: "Should any existing conditions such as deterioration or non-complying construction be discovered which is not covered by the DSA-approved documents wherein the finished work will not comply with Title 24, California Code of Regulations, a construction change document, or a separate set of plans and specifications, detailing and specifying the required repair work shall be submitted to and approved by DSA before proceeding with the repair work."

10.9 Ownership of Drawings

All copies of Plans, Drawings, Designs, Specifications, and copies of other incidental architectural and engineering work, or copies of other Contract Documents furnished by District, are the property of District. They are not to be used by Contractor in other work and, with the exception of signed sets of Contract Documents, are to be returned to District on request at completion of Work, or may be used by District as it may require without any additional costs to District. Neither the Contractor nor any Subcontractor, or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications, and other documents prepared by the Architect. District hereby grants the Contractor, Subcontractors, sub-subcontractors, and material or equipment suppliers a limited license to use applicable portions of the Drawings prepared for the Project in the execution of their Work under the Contract Documents.

11. CONTRACTOR'S SUBMITTALS AND SCHEDULES

Contractor's submittals shall comply with the provisions and requirements of the Specifications including, without limitation Submittals.

11.1 Schedule of Work, Schedule of Submittals, and Schedule of Values

11.1.1 Within **TEN (10)** calendar days after the date of the Notice to Proceed (unless otherwise specified in the Specifications), the Contractor shall prepare and submit to the District for review, in a form supported by sufficient data to substantiate its accuracy as the District may require:

11.1.1.1 Preliminary Schedule. A preliminary schedule of construction indicating the starting and completion dates of the various stages of the Work, including any information and following any form as may be specified in the Specifications. Once approved by District, this shall become the Construction Schedule. This schedule shall include and identify all tasks that are on the Project's critical path with a specific determination of the start and completion of each critical path task as well as all Contract milestones and each milestone's completion date(s) as may be required by the District.

11.1.1.1.1 The District is not required to approve a preliminary schedule of construction with early completion, i.e., one that shows early completion dates for the Work and/or milestones. Contractor shall not be entitled to extra compensation if the District approves a Construction Schedule with an early completion date and Contractor completes the Project beyond the date shown in the schedule but within the Contract Time. A Construction Schedule showing the Work completed in less than the Contract Time, the time between the early completion date and the end of the Contract Time shall be Float.

11.1.1.2 Preliminary Schedule of Values. A preliminary schedule of values for all of the Work, which must include quantities and prices of items aggregating the Contract Price and must subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Unless the Special Conditions contain different limits, this preliminary schedule of values shall include, at a minimum, the following information and the following structure:

11.1.1.2.1 Divided into at least the following categories:

11.1.1.2.1.1 Overhead and profit;
11.1.1.2.1.2 Supervision;
11.1.1.2.1.3 General conditions;
11.1.1.2.1.4 Layout;
11.1.1.2.1.5 Mobilization;
11.1.1.2.1.6 Submittals;
11.1.1.2.1.7 Bonds and insurance;
11.1.1.2.1.8 Close-out/Certification documentation;
11.1.1.2.1.9 Demolition;
11.1.1.2.1.10 Installation;
11.1.1.2.1.11 Rough-in;
11.1.1.2.1.12 Finishes;
11.1.1.2.1.13 Testing;
11.1.1.2.1.14 Punchlist and District acceptance.

11.1.1.2.2 And also divided by each of the following areas:

11.1.1.2.2.1 Site work;
11.1.1.2.2.2 By each building;
11.1.1.2.2.3 By each floor.

11.1.1.2.3 The preliminary schedule of values shall not provide for values any greater than the following percentages of the Contract value:

11.1.1.2.3.1 Mobilization and layout combined to equal not more than 1%;
11.1.1.2.3.2 Submittals, samples and shop drawings combined to equal not more than 3%;
11.1.1.2.3.3 Bonds and insurance combined to equal not more than 2%.
11.1.1.2.3.4 Closeout documentation shall have a value in the preliminary schedule of not less than 5%.

11.1.1.2.4 Notwithstanding any provision of the Contract Documents to the contrary, payment of the Contractor's overhead, supervision, general conditions costs, and profit, as reflected in the Cost Breakdown, shall be paid based on percentage complete, with the disbursement of Progress Payments and the Final Payment.

11.1.1.2.5 Contractor shall certify that the preliminary schedule of values as submitted to the District is accurate and reflects the costs as developed in preparing Contractor's bid. For example, without limiting the foregoing, Contractor shall not "front-load" the preliminary schedule of values with dollar amounts greater than the value of activities performed early in the Project.

11.1.1.2.6 The preliminary schedule of values shall be subject to the District's review and approval of the form and content thereof. In the event that the District objects to any portion of the preliminary schedule of values, the District shall notify the Contractor, in writing, of the District's objection(s) to the preliminary schedule of values. Within five (5) calendar days of the date of the District's written objection(s), Contractor shall submit a revised preliminary schedule of values to the District for review and approval. The foregoing procedure for the preparation, review and approval of the preliminary schedule of values shall continue until the District has approved the entirety of the preliminary schedule of values.

11.1.1.2.7 Once the preliminary schedule of values is approved by the District, this shall become the Schedule of Values. The Schedule of Values shall not be thereafter modified or amended by the Contractor without the prior consent and approval of the District, which may be granted or withheld in the sole discretion of the District.

11.1.1.3 Preliminary Schedule of Submittals. A preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals. Once approved by District, this shall become the Submittal Schedule. All submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those submittals shall be forwarded to the District so as not to delay the Construction Schedule. Upon request by the District, Contractor shall provide an electronic copy of all submittals to the

District. All submittals shall be submitted no later than 90 days after the Notice to Proceed.

11.1.1.4 Safety Plan. Contractor's Safety Plan specifically adapted for the Project. Contractor's Safety Plan shall comply with the following requirements:

11.1.1.4.1 All applicable requirements of California Division of Occupational Safety and Health ("CalOSHA") and/or of the United States Occupational Safety and Health Administration ("OSHA").

11.1.1.4.2 All provisions regarding Project safety, including all applicable provisions in these General Conditions.

11.1.1.4.3 Contractor's Safety Plan shall be in English and in the language(s) of the Contractor's and its Subcontractors' employees.

11.1.1.5 Complete Registered Subcontractors List. The name, address, telephone number, facsimile number, California State Contractors License number, classification, DIR registration number and monetary value of all Subcontracts of any tier for parties furnishing labor, material, or equipment for completion of the Project.

11.1.2 Contractor must provide all schedules both in hard copy and electronically, in a format (e.g., Microsoft Project or Primavera) approved in advance by the District.

11.1.3 The District will review the schedules submitted and the Contractor shall make changes and corrections in the schedules as requested by the District and resubmit the schedules until approved by the District.

11.1.4 The District shall have the right at any time to revise the schedule of values if, in the District's sole opinion, the schedule of values does not accurately reflect the value of the Work performed.

11.1.5 All schedules must be approved by the District before Contractor can rely on them as a basis for payment.

11.2 Monthly Progress Schedule(s)

11.2.1 Contractor shall provide Monthly Progress Schedule(s) to the District. A Monthly Progress Schedule shall update the approved Construction Schedule or the last Monthly Progress Schedule, showing all work completed and to be completed as well as updating the Registered Subcontractors List. The monthly Progress Schedule shall be sent within the timeframe requested by the District and shall be in a format acceptable to the District and contain a written narrative of the progress of work that month and any changes, delays, or events that may affect the work. The process for District approval of the Monthly Progress Schedule shall be the same as the process for approval of the Construction Schedule.

11.2.2 Contractor shall submit Monthly Progress Schedule(s) with all payment applications.

11.2.3 Contractor must provide all schedules both in hard copy and electronically, in a format (e.g., Microsoft Project or Primavera) approved in advance by the District.

11.2.4 The District will review the schedules submitted and the Contractor shall make changes and corrections in the schedules as requested by the District and resubmit the schedules until approved by the District.

11.2.5 The District shall have the right at any time to revise the schedule of values if, in the District's sole opinion, the schedule of values does not accurately reflect the value of the Work performed.

11.2.6 All schedules must be approved by the District before Contractor can rely on them as a basis for payment.

11.3 Material Safety Data Sheets (MSDS)

Contractor is required to ensure Material Safety Data Sheets are available in a readily accessible place at the Site for any material requiring a Material Safety Data Sheet per the federal "Hazard Communication" standard, or employees' "right to know" law. The Contractor is also required to ensure proper labeling on substances brought onto the job site and that any person working with the material or within the general area of the material is informed of the hazards of the substance and follows proper handling and protection procedures. Two additional copies of the Material Safety Data Sheets shall also be submitted directly to the District.

11.4 Submittals

11.4.1 Architect's favorable review shall neither be construed as a complete check nor relieve the Contractor, Subcontractor, manufacturer, fabricator, or supplier from responsibility for any deficiency that may exist or from any departures or deviations from the requirements of the Contract Documents unless the Contractor has, in writing, called Architect's attention to the deviations at the time of submission and the Architect has given specific written response. "Favorable review" shall mean merely that Architect has no objection to Contractor using, upon Contractor's own full responsibility, plan or method of Work proposed, or furnishing materials or equipment proposed.

12. SITE ACCESS, CONDITIONS, AND REQUIREMENTS

12.1 Site Investigation

Before bidding on this Work, Contractor shall make a careful investigation of the Site and thoroughly familiarize itself with the requirements of the Contract. By the act of submitting a bid for the Work included in this Contract, Contractor shall be deemed to have made a complete study and investigation, and to be familiar with and accepted the existing conditions of the Site.

Prior to commencing the Work, Contractor and the District's representative shall survey the Site to document the condition of the Site. Contractor will record the survey in digital videotape format and provide an electronic copy to the District within fourteen (14) days of the survey. This electronic record shall serve as a basis for determining any damages caused by the Contractor during the Project. The Contractor may also document any pre-existing conditions in writing, provided that both the Contractor and the District's representative agree on said conditions and sign a memorandum documenting the same.

12.2 Soils Investigation Report

12.2.1 When a soils investigation report obtained from test holes at Site or for the Project is available, that report may be available to the Contractor but shall not be a part of this Contract and shall not alleviate or excuse the Contractor's obligation to perform its own investigation. Any information obtained from that report or any information given on Drawings as to subsurface soil condition or to elevations of existing grades or elevations of underlying rock is approximate only, is not guaranteed, does not form a part of this Contract, and Contractor may not rely thereon. By submitting its bid, Contractor acknowledges that it has made visual examination of Site and has made whatever tests Contractor deems appropriate to determine underground condition of soil. Although any such report is not a part of this Contract, recommendations from the report may be included in the Drawings, Specifications, or other Contract Documents. It is Contractor's sole responsibility to thoroughly review all Contract Documents, Drawings, and Specifications.

12.2.2 Contractor agrees that no claim against District will be made by Contractor for damages and hereby waives any rights to damages if, during progress of Work, Contractor encounters subsurface or latent conditions at Site materially differing from those shown on Drawings or indicated in Specifications, or for unknown conditions of an unusual nature that differ materially from those ordinarily encountered in the work of the character provided for in Plans and Specifications, except as indicated in the provisions of these General Conditions regarding trenches, trenching, and/or existing utility lines.

12.3 Access to Work

District and its representatives shall at all times have access to Work wherever it is in preparation or progress, including storage and fabrication. Contractor shall provide safe and proper facilities for such access so that District's representatives may perform their functions.

12.4 Layout and Field Engineering

12.4.1 All field engineering required for layout of this Work and establishing grades for earthwork operations shall be furnished by Contractor at its expense. This Work shall be done by a qualified, California-registered civil engineer approved in writing by District and Architect. Any required Record and/or As-Built Drawings of Site development shall be prepared by the approved civil engineer.

12.4.2 The Contractor shall be responsible for having ascertained pertinent local conditions such as location, accessibility, and general character of the Site and for having satisfied itself as to the conditions under which the Work is to be performed. Contractor shall follow best practices, including but not limited to potholing to avoid utilities. District shall not be liable for any claim for allowances because of Contractor's error, failure to follow best practices, or negligence in acquainting itself with the conditions at the Site.

12.4.3 Contractor shall protect and preserve established benchmarks and monuments and shall make no changes in locations without the prior written approval of District. Contractor shall replace any benchmarks or monuments that are lost or destroyed subsequent to proper notification of District and with District's approval.

12.5 Utilities

Utilities shall be provided as indicated in the Specifications.

12.6 Sanitary Facilities

Sanitary facilities shall be provided as indicated in the Specifications.

12.7 Surveys

Contractor shall provide surveys done by a California-licensed civil engineer surveyor to determine locations of construction, grading, and site work as required to perform the Work.

12.8 Regional Notification Center

The Contractor, except in an emergency, shall contact the appropriate regional notification center at least two (2) days prior to commencing any excavation if the excavation will be conducted in an area or in a private easement that is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the District, and obtain an inquiry identification number from that notification center. No excavation shall be commenced and/or carried out by the Contractor unless an inquiry identification number has been assigned to the Contractor or any Subcontractor and the Contractor has given the District the identification number. Any damages arising from Contractor's failure to make appropriate notification shall be at the sole risk and expense of the Contractor. Any delays caused by failure to make appropriate notification shall be at the sole risk of the Contractor and shall not be considered for an extension of the Contract Time.

12.9 Existing Utility Lines

12.9.1 Pursuant to Government Code section 4215, District assumes the responsibility for removal, relocation, and protection of main or trunk utility lines and facilities located on the construction Site at the time of commencement of construction under this Contract with respect to any such utility facilities that are not identified in the Plans and Specifications. Contractor shall not be assessed for liquidated damages for delay in completion of the Project caused by failure of District or the owner of a utility to provide for removal or relocation of such utility facilities.

12.9.2 Locations of existing utilities provided by District shall not be considered exact, but approximate within a reasonable margin and shall not relieve Contractor of responsibilities to exercise reasonable care or costs of repair due to Contractor's failure to do so. District shall compensate Contractor for the costs of locating, repairing damage not due to the failure of 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 necessarily idle during such work.

12.9.3 No provision herein shall be construed to preclude assessment against Contractor for any other delays in completion of the Work. Nothing in this Article shall be deemed to require District to indicate the presence of existing service laterals, appurtenances, or other utility lines, within the exception of main or trunk utility lines or whenever the presence of these utilities on the Site of the construction Project can be inferred from the presence of other visible facilities, such as buildings, meter junction boxes, on or adjacent to the Site of the construction.

12.9.4 If Contractor, while performing Work under this Contract, discovers utility facilities not identified by District in Contract Plans and Specifications, Contractor shall immediately notify the District and the utility in writing. The cost of repair for

damage to above-mentioned visible facilities without prior written notification to the District shall be borne by the Contractor.

12.10 Notification

Contractor understands, acknowledges and agrees that the purpose for prompt notification to the District pursuant to these provisions is to allow the District to investigate the condition(s) so that the District shall have the opportunity to decide how the District desires to proceed as a result of the condition(s). Accordingly, failure of Contractor to promptly notify the District in writing, pursuant to these provisions, shall constitute Contractor's waiver of any claim for damages or delay incurred as a result of the condition(s).

12.11 Hazardous Materials

Contractor shall comply with all provisions and requirements of the Contract Documents related to hazardous materials including, without limitation, Hazardous Materials Procedures and Requirements.

12.12 No Signs

Neither the Contractor nor any other person or entity shall display any signs not required by law or the Contract Documents at the Site, fences trailers, offices, or elsewhere on the Site without specific prior written approval of the District.

13. TRENCHES

13.1 Trenches Greater Than Five Feet

Pursuant to Labor Code section 6705, if the Contract Price exceeds $25,000 and involves the excavation of any trench or trenches five (5) feet or more in depth, the Contractor shall, in advance of excavation, promptly submit to the District and/or a registered civil or structural engineer employed by the District or Architect, a detailed plan, stamped by a licensed engineer retained by the Contractor, showing the design of shoring for protection from the hazard of caving ground during the excavation of such trench or trenches.

13.2 Excavation Safety

If such plan varies from the Shoring System Standards established by the Construction Safety Orders, the plan shall be prepared by a registered civil or structural engineer, but in no case shall such plan be less effective than that required by the Construction Safety Orders. No excavation of such trench or trenches shall be commenced until said plan has been accepted by the District or by the person to whom authority to accept has been delegated by the District.

13.3 No Tort Liability of District

Pursuant to Labor Code section 6705, nothing in this Article shall impose tort liability upon the District or any of its employees.

13.4 No Excavation without Permits

The Contractor shall not commence any excavation Work until it has secured all necessary permits including the required CalOSHA excavation/shoring permit. Any permits shall be prominently displayed on the Site prior to the commencement of any excavation.

13.5 Discovery of Hazardous Waste and/or Unusual Conditions

13.5.1 Pursuant to Public Contract Code section 7104, if the Work involves digging trenches or other excavations that extend deeper than four feet below the Surface, the Contractor shall promptly, and before the following conditions are disturbed, notify the District, in writing, of any:

13.5.1.1 Material that the Contractor believes may be material that is hazardous waste, as defined in section 25117 of the Health and Safety Code, is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

13.5.1.2 Subsurface or latent physical conditions at the Site differing from those indicated.

13.5.1.3 Unknown physical conditions at the Site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

13.5.2 The District shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work, shall issue a Change Order under the procedures described herein.

13.5.3 In the event that a dispute arises between District and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided either by Contract or by law that pertain to the resolution of disputes and protests.

14. INSURANCE AND BONDS

14.1 Insurance

Unless different provisions and/or limits are indicated in the Special Conditions, all insurance required of Contractor and/or its Subcontractor(s) shall be at least as broad as the amounts and include the provisions set forth herein.

14.1.1 Commercial General Liability and Automobile Liability Insurance

14.1.1.1 Contractor shall procure and maintain, during the life of this Contract, Commercial General Liability Insurance and Automobile Liability Insurance that shall protect Contractor, District, State, Construction Manager(s), Project Inspector(s), and Architect(s) from all claims for bodily injury, property damage, personal injury, death, advertising injury, and medical payments arising from, or in connection with, operations under this Contract. This coverage shall be provided in a form at least as broad as Insurance Services (ISO) Form CG 0001 11188. Contractor shall ensure that Products Liability and Completed Operations coverage, Fire Damage Liability coverage, and Automobile Liability Insurance coverage including owned, non-owned, and hired automobiles, are included within the above policies and at the required limits, or Contractor shall procure and maintain these coverages separately.

14.1.1.2 Contractor's deductible or self-insured retention for its Commercial General Liability Insurance policy shall not exceed $25,000 unless approved in writing by District.

14.1.1.3 All such policies shall be written on an occurrence form.

14.1.2 Excess Liability Insurance

14.1.2.1 If Contractor's underlying policy limits are less than required, subject to the District's sole discretion, Contractor may procure and maintain, during the life of this Contract, an Excess Liability Insurance Policy to meet the policy limit requirements of the required policies in order to satisfy, in the aggregate with its underlying policy, the insurance requirements herein..

14.1.2.2 There shall be no gap between the per occurrence amount of any underlying policy and the start of the coverage under the Excess Liability Insurance Policy. Any Excess Liability Insurance Policy shall be written on a following form and shall protect Contractor, District, State, Construction Manager(s), Project Manager(s), and Architect(s) in amounts and including the provisions as set forth in the Supplementary Conditions (if any) and/or Special Conditions, and that complies with all requirements for Commercial General Liability and Automobile Liability and Employers' Liability Insurance.

14.1.2.3 The District, in its sole discretion, may accept the Excess Liability Insurance Policy that brings Contractor's primary limits to the minimum requirements herein.

14.1.3 Subcontractor(s): Contractor shall require its Subcontractor(s), if any, to procure and maintain Commercial General Liability Insurance, Automobile Liability Insurance, and Excess Liability Insurance (if Subcontractor elects to satisfy, in part the insurance required herein by procuring and maintaining an Excess Liability Insurance Policy) with forms of coverage and limits equal to the amounts required of the Contractor.

14.1.4 Workers' Compensation and Employers' Liability Insurance

14.1.4.1 In accordance with provisions of section 3700 of the California Labor Code, the Contractor and every Subcontractor shall be required to secure the payment of compensation to its employees.

14.1.4.2 Contractor shall procure and maintain, during the life of this Contract, Workers' Compensation Insurance and Employers' Liability Insurance for all of its employees engaged in work under this Contract, on/or at the Site of the Project. This coverage shall cover, at a minimum, medical and surgical treatment, disability benefits, rehabilitation therapy, and survivors' death benefits. Contractor shall require its Subcontractor(s), if any, to procure and maintain Workers' Compensation Insurance and Employers' Liability Insurance for all employees of Subcontractor(s). Any class of employee or employees not covered by a Subcontractor's insurance shall be covered by Contractor's insurance. If any class of employee or employee engaged in Work under this Contract, on or at the Site of the Project, is not protected under the Workers' Compensation Insurance, Contractor shall provide, or shall cause a Subcontractor to provide, adequate insurance coverage for the protection of any employee(s) not otherwise protected before any of those employee(s) commence work.

14.1.5 Builder's Risk Insurance: Builder's Risk "All Risk" Insurance

Contractor shall procure and maintain, during the life of this Contract, Builder's Risk (Course of Construction), or similar first party property coverage acceptable to the District, issued on a replacement cost value basis. The cost shall be consistent with the total replacement cost of all insurable Work of the Project included within the Contract Documents. Coverage is to insure against all risks of accidental physical loss and shall include without limitation the perils of vandalism and/or malicious mischief (both without any limitation regarding vacancy or occupancy), sprinkler leakage, civil authority, theft, sonic disturbance, earthquake, flood, collapse, wind, rain, dust, fire, war, terrorism, lightning, smoke, and rioting. Coverage shall include debris removal, demolition, increased costs due to enforcement of all applicable ordinances and/or laws in the repair and replacement of damaged and undamaged portions of the property, and reasonable costs for the Architect's and engineering services and expenses required as a result of any insured loss upon the Work and Project, including completed Work and Work in progress, to the full insurable value thereof.

14.1.6 Pollution Liability Insurance

14.1.6.1 Contractor shall procure and maintain Pollution Liability Insurance that shall protect Contractor, District, State, Construction Manager(s), Project Inspector(s), and Architect(s) from all claims for bodily injury, property damage, including natural resource damage, cleanup costs, removal, storage, disposal, and/or use of the pollutant arising from operations under this Contract, and defense, including costs and expenses incurred in the investigation, defense, or settlement of claims. Coverage shall apply to sudden and/or gradual pollution conditions resulting from the escape or release of smoke, vapors, fumes, acids, alkalis, toxic chemicals, liquids, or gases, natural gas, waste materials, or other irritants, contaminants, or pollutants, including asbestos. This coverage shall be provided in a form at least as broad as Insurance Services Offices, Inc. (ISO) Form CG 2415, or Contractor shall procure and maintain these coverages separately.

14.1.6.2 Contractor warrants that any retroactive date applicable to coverage under the policy shall predate the effective date of the Contract and that continuous coverage will be maintained or an extended reporting or discovery period will be exercised for a period of three (3) years, beginning from the time that the Work under the Contract is completed.

14.1.6.3 If Contractor is responsible for removing any pollutants from a site, then Contractor shall ensure that Any Auto, including owned, non-owned, and hired, is included within the above policies and at the required limits, to cover its automobile exposure from transporting the pollutants from the site to an approved disposal site. This coverage shall include the Motor Carrier Act Endorsement, MCS 90.

14.1.7 Proof of Insurance and Other Requirements: Endorsements and Certificates

14.1.7.1 Contractor shall not commence Work nor shall it allow any Subcontractor to commence Work under this Contract, until Contractor and its Subcontractor(s) have procured all required insurance and Contractor has delivered in duplicate to the District complete endorsements (or entire insurance policies) and certificates indicating the required coverages have been obtained, and the District has approved these documents.

14.1.7.2 Endorsements, certificates, and insurance policies shall include the following:

14.1.7.2.1 A clause stating the following, or other language acceptable to the District:

"This policy shall not be canceled until written notice to District, Architect, and Construction Manager stating date of the cancellation by the insurance carrier. Date of cancellation may not be less than thirty (30) days after date of mailing notice."

14.1.7.2.2 Language stating in particular those insured, extent of insurance, location and operation to which insurance applies, expiration date, to whom cancellation and reduction notice will be sent, and length of notice period.

14.1.7.2.3 All endorsements, certificates and insurance policies shall state that District, its trustees, employees and agents, the State of California, Construction Manager(s), Project Manager(s), Inspector(s) and Architect(s) are named additional insureds under all policies except Workers' Compensation Insurance and Employers' Liability Insurance.

14.1.7.2.4 All endorsements shall waive any right to subrogation against any of the named additional insureds.

14.1.7.2.5 Contractor's and Subcontractors' insurance policy(s) shall be primary and non-contributory to any insurance or self-insurance maintained by District, its trustees, employees and/or agents, the State of California, Construction Manager(s), Project Manager(s), Inspector(s), and/or Architect(s).

14.1.7.2.6 Contractor's insurance limit shall apply separately to each insured against whom a claim is made or suit is brought.

14.1.7.3 No policy shall be amended, canceled or modified, and the coverage amounts shall not be reduced, until Contractor or Contractor's broker has provided written notice to District, Architect(s), and Construction Manager(s) stating date of the amendment, modification, cancellation or reduction, and a description of the change. Date of amendment, modification, cancellation or reduction may not be less than thirty (30) days after date of mailing notice.

14.1.7.4 Insurance written on a "claims made" basis shall be retroactive to a date that coincides with or precedes Contractor's commencement of Work, including subsequent policies purchased as renewals or replacements. Said policy is to be renewed by the Contractor and all Subcontractors for a period of five (5) years following completion of the Work or termination of this Agreement. Such insurance must have the same coverage and limits as the policy that was in effect during the term of this Agreement, and will cover the Contractor and all Subcontractors for all claims made.

14.1.7.5 Unless otherwise stated in the Special Conditions, all of Contractor's insurance shall be with insurance companies with an A.M. Best rating of no less than **A: VII**.

14.1.7.6 The insurance requirements set forth herein shall in no way limit the Contractor's liability arising out of or relating to the performance of the Work or related activities.

14.1.7.7 Failure of Contractor and/or its Subcontractor(s) to comply with the insurance requirements herein shall be deemed a material breach of the Contract.

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14.1.8 Insurance Policy Limits

14.1.8.1 Unless different limits are indicated in the Special Conditions, the limits of insurance shall not be less than the following amounts:

Commercial General Liability	Product Liability and Completed Operations, Fire Damage Liability – Split Limit	$2,000,000 per occurrence; $4,000,000 aggregate
Automobile Liability	Any Auto – Combined Single Limit	$1,000,000
Workers' Compensation		Statutory limits pursuant to State law
Employers' Liability		$1,000,000
Builder's Risk (Course of Construction)		Issued for the value and scope of Work indicated herein.
Pollution Liability		$1,000,000 per claim; $2,000,000 aggregate

14.1.8.2 If Contractor normally carries insurance in an amount greater than the minimum amounts required by District, that greater amount shall become the minimum required amount of insurance for purposes of the Contract. Therefore, Contractor hereby acknowledges and agrees that all insurance carried by it shall be deemed liability coverage for all actions it performs in connection with the Contract.

14.2 Contract Security - Bonds

14.2.1 Contractor shall furnish two surety bonds issued by a California admitted surety insurer as follows:

14.2.1.1 Performance Bond: A bond in an amount at least equal to one hundred percent (100%) of Contract Price as security for faithful performance of this Contract.

14.2.1.2 Payment Bond: A bond in an amount at least equal to one hundred percent (100%) of the Contract Price as security for payment of persons performing labor and/or furnishing materials in connection with this Contract.

14.2.2 Cost of bonds shall be included in the Bid and Contract Price.

14.2.3 All bonds related to this Project shall be in the forms set forth in these Contract Documents and shall comply with all requirements of the Contract Documents, including, without limitation, the bond forms.

15. WARRANTY/GUARANTEE/INDEMNITY

15.1 Warranty/Guarantee

15.1.1 The Contractor shall obtain and preserve for the benefit of the District, manufacturer's warranties on materials, fixtures, and equipment incorporated into the Work.

15.1.2 In addition to guarantees required elsewhere, Contractor shall, and hereby does guarantee and warrant all Work furnished on the job against all defects for a period of **ONE (1)** year after the later of the following dates, unless a longer period is provided for in the Contract Documents:

15.1.2.1 The acceptance by the District's governing board of the Work, subject to these General Conditions, or

15.1.2.2 The date that commissioning for the Project, if any, was completed.

At the District's sole option, Contractor shall repair or replace any and all of that Work, together with any other Work that may be displaced in so doing, that may prove defective in workmanship and/or materials within a **ONE (1)** year period from date of completion as defined above, unless a longer period is provided for in the Contract Documents, without expense whatsoever to District. In the event of failure of Contractor and/or Surety to commence and pursue with diligence said replacements or repairs within ten (10) days after being notified in writing, Contractor and Surety hereby acknowledge and agree that District is authorized to proceed to have defects repaired and made good at expense of Contractor and/or Surety who hereby agree to pay costs and charges therefore immediately on demand.

15.1.3 If, in the opinion of District, defective work creates a dangerous condition or requires immediate correction or attention to prevent further loss to District or to prevent interruption of District operations, District will attempt to give the notice required above. If Contractor or Surety cannot be contacted or neither complies with District's request for correction within a reasonable time as determined by District, District may, notwithstanding the above provision, proceed to make any and all corrections and/or provide attentions the District believes are necessary. The costs of correction or attention shall be charged against Contractor and Surety of the guarantees provided in this Article or elsewhere in this Contract.

15.1.4 The above provisions do not in any way limit the guarantees on any items for which a longer guarantee is specified or on any items for which a manufacturer gives a guarantee for a longer period. Contractor shall furnish to District all appropriate guarantee or warranty certificates as indicated in the Specifications or upon request by District.

15.1.5 Nothing herein shall limit any other rights or remedies available to District.

15.2 Indemnity and Defense

15.2.1 To the furthest extent permitted by California law, the Contractor shall indemnify, keep and hold harmless the District, the Architect(s), and the Construction Manager(s), their respective consultants, separate contractors, board members, officers, representatives, agents, and employees, in both individual and official capacities ("Indemnitees"), against all suits, claims, injury, damages, losses, and expenses ("Claims"), including but not limited to attorney's fees, caused by, arising out of, resulting from, or incidental to, in whole or in part, the performance of the Work under this Contract by the Contractor, its Subcontractors, vendors, or suppliers. However, the Contractor's indemnification and hold harmless obligation shall be reduced by the proportion of the Indemnitees' and/or Architect's liability to the extent the Claim(s) is/are caused by the sole negligence, active negligence, or willful misconduct of the Indemnitees, and/or defects in design furnished by the Architect, as found by a court or arbitrator of competent jurisdiction. This indemnification and hold harmless obligation of the Contractor shall not be construed to negate, abridge, or otherwise reduce any right or obligation of indemnity that would otherwise exist or arise as to any Indemnitee or other person described herein. This indemnification and hold harmless obligation includes, but is not limited to, any failure or alleged failure by Contractor to comply with any provision of law, any failure or alleged failure to timely and properly fulfill all of its obligations under the Contract Documents in strict accordance with their terms, and without limitation, any failure or alleged failure of Contractor's obligations regarding any stop payment notice actions or liens, including Civil Wage and Penalty Assessments and/or Orders by the DIR.

15.2.2 To the furthest extent permitted by California law, Contractor shall also defend Indemnitees, at its own expense, including but not limited to attorneys' fees and costs, against all Claims caused by, arising out of, resulting from, or incidental to, in whole or in part, the performance of the Work under this Contract by the Contractor, its Subcontractors, vendors, or suppliers. However, without impacting Contractor's obligation to provide an immediate and ongoing defense of Indemnitees, the Contractor's defense obligation shall be retroactively reduced by the proportion of the Indemnitees' and/or Architect's liability to the extent caused by the sole negligence, active negligence, or willful misconduct of the Indemnitees, and/or defects in design furnished by the Architect, as found by a court or arbitrator of competent jurisdiction. The District shall have the right to accept or reject any legal representation that Contractor proposes to defend the Indemnitees. If any Indemnitee provides its own defense due to failure to timely respond to tender of defense, rejection of tender of defense, or conflict of interest of proposed counsel, Contractor shall reimburse such Indemnitee for any expenditures. Contractor's defense obligation shall not be construed to negate, abridge, or otherwise reduce any right or obligation of defense that would otherwise exist as to any Indemnitee or other person described herein. Contractor's defense obligation includes, but is not limited to, any failure or alleged failure by Contractor to comply with any provision of law, any failure or alleged failure to timely and properly fulfill all of its obligations under the Contract Documents in strict accordance with their terms, and without limitation, any failure or alleged failure of Contractor's obligations regarding any stop payment notice actions or liens, including Civil Wage and Penalty Assessments and/or Orders by the DIR. The Contractor shall give prompt notice to the District in the event of any Claim(s).

15.2.3 Without limitation of the provisions herein, if the Contractor's obligation to indemnify and hold harmless the Indemnitees or its obligation to defend Indemnitees as provided herein shall be determined to be void or unenforceable, in whole or in part, it is the intention of the parties that these circumstances shall not otherwise affect the validity or enforceability of the Contractor's agreement to indemnify, defend, and hold harmless the rest of the Indemnitees, as provided herein. Further, the Contractor shall be and remain fully liable on its agreements and obligations herein to the fullest extent permitted by law.

15.2.4 Pursuant to Public Contract Code section 9201, the District shall provide timely notification to Contractor of the receipt of any third-party Claim relating to this Contract. The District shall be entitled to recover its reasonable costs incurred in providing said notification.

15.2.5 In any and all Claims against any of the Indemnitees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the Contractor's indemnification obligation herein shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

15.2.6 The District may retain so much of the moneys due the Contractor as shall be considered necessary, until disposition of any such Claims or until the District, Architect(s) and Construction Manager(s) have received written agreement from the Contractor that they will unconditionally defend the District, Architect(s) and Construction Manager(s), their respective officers, agents and employees, and pay any damages due by reason of settlement or judgment.

15.2.7 The Contractor's defense and indemnification obligations hereunder shall survive the completion of Work, the warranty/guarantee period, and the termination of the Contract.

16. TIME

16.1 Notice to Proceed

16.1.1 District may issue a Notice to Proceed within ninety (90) days from the date of the Notice of Award. Once Contractor has received the Notice to Proceed, Contractor shall complete the Work within the period of time indicated in the Contract Documents.

16.1.2 In the event that the District desires to postpone issuing the Notice to Proceed beyond ninety (90) days from the date of the Notice of Award, it is expressly understood that with reasonable notice to the Contractor, the District may postpone issuing the Notice to Proceed. It is further expressly understood by Contractor that Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of the issuance of the Notice to Proceed.

16.1.3 If the Contractor believes that a postponement of issuance of the Notice to Proceed will cause a hardship to Contractor, Contractor may terminate the Contract. Contractor's termination due to a postponement shall be by written notice to District within ten (10) days after receipt by Contractor of District's notice of postponement.

It is further understood by Contractor that in the event that Contractor terminates the Contract as a result of postponement by the District, the District shall only be obligated to pay Contractor for the Work that Contractor had performed at the time of notification of postponement. Should Contractor terminate the Contract as a result of a notice of postponement, District shall have the authority to award the Contract to the next lowest responsive responsible bidder.

16.2 Computation of Time / Adverse Weather

16.2.1 The Contractor will only be allowed a time extension for Adverse Weather conditions if requested by Contractor in compliance with the time extension request procedures and only if all of the following conditions are met:

16.2.1.1 The weather conditions constitute Adverse Weather, as defined herein;

16.2.1.2 Contractor can verify that the Adverse Weather caused delays in excess of five (5) hours of the indicated labor required to complete the scheduled tasks of Work on the day affected by the Adverse Weather;

16.2.1.3 The Contractor's crew is dismissed as a result of the Adverse Weather;

16.2.1.4 Said delay adversely affects the critical path in the Construction Schedule; and

16.2.1.5 Exceeds twelve (12) days of delay per year.

16.2.2 If the aforementioned conditions are met, a non-compensable day-for-day extension will only be allowed for those days in excess of those indicated herein.

16.2.3 The Contractor shall work seven (7) days per week, if necessary, irrespective of inclement weather, to maintain access and the Construction Schedule, and to protect the Work under construction from the effects of Adverse Weather, all at no further cost to the District.

16.2.4 The Contract Time has been determined with consideration given to the average climate weather conditions prevailing in the County in which the Project is located.

16.3 Hours of Work

16.3.1 Sufficient Forces

Contractor and Subcontractors shall continuously furnish sufficient and competent work forces with the required levels of familiarity with the Project and skill, training and experience to ensure the prosecution of the Work in accordance with the Construction Schedule.

16.3.2 Performance During Working Hours

Work shall be performed during regular working hours as permitted by the appropriate governmental agency except that in the event of an emergency, or when required to complete the Work in accordance with job progress, Work may be performed outside of regular working hours with the advance written consent of the District and approval of any required governmental agencies.

16.3.3 No Work during State Testing

Contractor shall, at no additional cost to the District and at the District's request, coordinate its Work to not disturb District students including, without limitation, not performing any Work when students at the Site are taking State or Federally-required tests. The District or District's Representative will provide Contractor with a schedule of test dates concurrent with the District's issuance of the Notice to Proceed, or as soon as test dates are made available to the District.

16.4 Progress and Completion

16.4.1 Time of the Essence

Time limits stated in the Contract Documents are of the essence to the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

16.4.2 No Commencement Without Insurance or Bonds

The Contractor shall not commence operations on the Project or elsewhere prior to the effective date of insurance and bonds. The date of commencement of the Work shall not be changed by the effective date of such insurance or bonds. If Contractor commences Work without insurance and bonds, all Work is performed at Contractor's peril and shall not be compensable until and unless Contractor secures bonds and insurance pursuant to the terms of the Contract Documents and subject to District claim for damages.

16.5 Schedule

Contractor shall provide to District, Construction Manager, and Architect a schedule in conformance with the Contract Documents and as required in the Notice to Proceed and the Contractor's Submittals and Schedules section of these General Conditions.

16.6 Expeditious Completion

The Contractor shall proceed expeditiously with adequate forces and shall achieve Completion within the Contract Time.

17. EXTENSIONS OF TIME – LIQUIDATED DAMAGES

17.1 Liquidated Damages

Contractor and District hereby agree that the exact amount of damages for failure to complete the Work within the time specified is extremely difficult or impossible to determine. If the Work is not completed within the time specified in the Contract Documents, it is understood that the District will suffer damage. It being impractical and unfeasible to determine the amount of actual damage, it is agreed the Contractor shall pay to District as fixed and liquidated damages, and not as a penalty, the amount set forth in the Agreement for each calendar day of delay in completion. Contractor and its Surety shall be liable for the amount thereof pursuant to Government Code section 53069.85.

17.2 Excusable Delay

17.2.1 Contractor shall not be charged for liquidated damages because of any delays in completion of the Work which are not the fault of Contractor or its Subcontractors, including acts of God as defined in Public Contract Code section 7105, acts of enemy, epidemics, and quarantine restrictions. Contractor shall, within five (5) calendar days of beginning of any delay, notify District in writing of causes of delay including documentation and facts explaining the delay and the direct correlation between the cause and effect. District shall review the facts and extent

of any delay and shall grant extension(s) of time for completing Work when, in its judgment, the findings of fact justify an extension. Extension(s) of time shall apply only to that portion of Work affected by delay, and shall not apply to other portions of Work not so affected. An extension of time may only be granted if Contractor has timely submitted the Construction Schedule as required herein.

17.2.2 Contractor shall notify the District pursuant to the claims provisions in these General Conditions of any anticipated delay and its cause. Following submission of a claim, the District may determine whether the delay is to be considered avoidable or unavoidable, how long it continues, and to what extent the prosecution and completion of the Work might be delayed thereby.

17.2.3 In the event the Contractor requests an extension of Contract Time for unavoidable delay, such request shall be submitted in accordance with the provisions in the Contract Documents governing changes in Work. When requesting time, requests must be submitted with full justification and documentation. If the Contractor fails to submit justification, it waives its right to a time extension at a later date. Such justification must be based on the official Construction Schedule as updated at the time of occurrence of the delay or execution of Work related to any changes to the Scope of Work. Any claim for delay must include the following information as support, without limitation:

17.2.3.1 The duration of the activity relating to the changes in the Work and the resources (manpower, equipment, material, etc.) required to perform the activities within the stated duration.

17.2.3.2 Specific logical ties to the Contract Schedule for the proposed changes and/or delay showing the activity/activities in the Construction Schedule that are affected by the change and/or delay. In particular, Contractor must show an actual impact to the schedule, after making a good faith effort to mitigate the delay by rescheduling the work, by providing an analysis of the schedule ("Time Impact Analysis"). Such Time Impact Analysis shall describe in detail the cause and effect of the delay and the impact on the critical dates in the Project schedule. (A portion of any delay of seven (7) days or more must be provided.)

17.2.3.3 A recovery schedule must be submitted within twenty (20) calendar days of written notification to the District of causes of delay.

17.3 No Additional Compensation for Delays Within Contractor's Control

17.3.1 Contractor is aware that governmental agencies, including, without limitation, the Division of the State Architect, the Department of General Services, gas companies, electrical utility companies, water districts, and other agencies may have to approve Contractor-prepared drawings or approve a proposed installation. Accordingly, Contractor shall include in its bid, time for possible review of its drawings and for reasonable delays and damages that may be caused by such agencies. Thus, Contractor is not entitled to make a claim for damages or delays arising from the review of Contractor's drawings.

17.3.2 Contractor shall only be entitled to compensation for delay when all of the following conditions are met:

17.3.2.1 The District is responsible for the delay;

17.3.2.2 The delay is unreasonable under the circumstances involved;

17.3.2.3 The delay was not within the contemplation of the District and Contractor;

17.3.2.4 The delay could not have been avoided or mitigated by Contractor's reasonable diligence; and

17.3.2.5 Contractor timely complies with the claims procedure of the Contract Documents.

17.3.3 Where a change in the Work extends the Contract Time, Contractor may request and recover additional, actual direct costs, provided that Contractor can demonstrate such additional costs are:

17.3.3.1 Actually incurred performing the Work;

17.3.3.2 Not compensated by the Markup allowed; and

17.3.3.3 Directly result from the extended Contract Time.

Contractor shall comply with all required procedures, documentation and time requirements in the Contract Documents. Contractor may not seek or recover such costs using formulas (e.g. Eichleay, labor factors).

17.4 Float or Slack in the Schedule

Float or slack is the amount of time between the early start date and the late start date, or the early finish date and the late finish date, of any of the activities in the schedule. Float or slack is not for the exclusive use of or benefit of either the District or the Contractor, but its use shall be determined solely by the District.

18. CHANGES IN THE WORK

18.1 No Changes Without Authorization

18.1.1 There shall be no change whatsoever in the Drawings, Specifications, or in the Work without an executed Change Order or a written Construction Change Directive authorized by the District as herein provided. District shall not be liable for the cost of any extra work or any substitutions, changes, additions, omissions, or deviations from the Drawings and Specifications unless the District's governing board has authorized the same and the cost thereof has been approved in writing by Change Order or Construction Change Directive in advance of the changed Work being performed. No extension of time for performance of the Work shall be allowed hereunder unless claim for such extension is made at the time changes in the Work are ordered, and such time duly adjusted and approved in writing in the Change Order or Construction Change Directive. Contractor shall be responsible for any costs incurred by the District for professional services and DSA fees and/or delay to the Project Schedule, if any, for DSA to review any request for changes to the DSA approved plans and specifications for the convenience of the Contractor and/or to accommodate the Contractor's means and methods. The provisions of the Contract Documents shall apply to all such changes, additions, and omissions with the same effect as if originally embodied in the Drawings and Specifications.

18.1.2 Contractor shall perform immediately all work that has been authorized by a fully executed Change Order or Construction Change Directive. Contractor shall be fully responsible for any and all delays and/or expenses caused by Contractor's failure to expeditiously perform this Work.

18.1.3 Should any Change Order result in an increase in the Contract Price or extend the Contract Time, the cost of or length of extension in that Change Order shall be agreed to, in writing, by the District in advance of the Work by Contractor, and shall be subject to the monetary limitations set forth in Public Contract Code section 20118.4. In the event that Contractor proceeds with any change in Work without a Change Order executed by the District or Construction Change Directive, Contractor waives any claim of additional compensation or time for that additional work. Under no circumstances shall Contractor be entitled to any claim of additional compensation or time not expressly requested by Contractor in a Proposed Change Order or approved by District in an executed Change Order.

18.1.4 A Change Order or Construction Change Directive will become effective when approved by the Board, notwithstanding that Contractor has not signed it. A Change Order or Construction Change Directive will become effective without Contractor's signature provided District indicates it as a "Unilateral Change Order". Any dispute as to the adjustment in the Contract Price or Contract Time, if any, of the Unilateral Change Order shall be resolved pursuant to the Payment and Claims and Disputes provisions herein.

18.1.5 Contractor understands, acknowledges, and agrees that the reason for District authorization is so that District may have an opportunity to analyze the Work and decide whether the District shall proceed with the Change Order or alter the Project so that a change in Work becomes unnecessary.

18.2 Architect Authority

The Architect will have authority to order minor changes in the Work not involving any adjustment in the Contract Price, or an extension of the Contract Time, or a change that is inconsistent with the intent of the Contract Documents. These changes shall be effected by written Change Order, Construction Change Directive, by Architect's response(s) to RFI(s), or by Architect's Supplemental Instructions ("ASI").

18.3 Change Orders

18.3.1 A Change Order is a written instrument prepared and issued by the District and/or the Architect and signed by the District (as authorized by the District's Governing Board), the Contractor, the Architect, and approved by the Project Inspector (if necessary) and DSA (if necessary), stating their agreement regarding all of the following:

18.3.1.1 A description of a change in the Work;

18.3.1.2 The amount of the adjustment in the Contract Price, if any; and

18.3.1.3 The extent of the adjustment in the Contract Time, if any.

18.4 Construction Change Directives

18.4.1 A Construction Change Directive is a written order prepared and issued by the District, the Construction Manager, and/or the Architect and signed by the

District and the Architect, directing a change in the Work. The District may, as provided by law, by Construction Change Directive and without invalidating the Contract, order changes in the Work consisting of additions, deletions, or other revisions. The adjustment to the Contract Price or Time, if any, is subject to the provisions of this section regarding Changes in the Work. If all or a portion of the Project is being funded by funds requiring approval by the State Allocation Board ("SAB"), these revisions may be subject to compensation once approval of same is received and funded by the SAB, and funds are released by the Office of Public School Construction ("OPSC"). Any dispute as to the adjustment in the Contract Price, if any, of the Construction Change Directive or timing of payment shall be resolved pursuant to the Payment and Claims and Disputes provisions herein.

18.4.2 The District may issue a Construction Change Directive in the absence of agreement on the terms of a Change Order.

18.5 Force Account Directives

18.5.1 When work, for which a definite price has not been agreed upon in advance, is to be paid for on a force account basis, all direct costs necessarily incurred and paid by the Contractor for labor, material, and equipment used in the performance of that Work, shall be subject to the approval of the District and compensation will be determined as set forth herein.

18.5.2 The District will issue a Force Account Directive to proceed with the Work on a force account basis, and a not-to-exceed budget will be established by the District.

18.5.3 All requirements regarding direct cost for labor, labor burden, material, equipment, and markups on direct costs for overhead and profit described in this section shall apply to Force Account Directives. However, the District will only pay for actual costs verified in the field by the District or its authorized representative(s) on a daily basis.

18.5.4 The Contractor shall be responsible for all cost related to the administration of Force Account Directive. The markup for overhead and profit for Contractor modifications shall be full compensation to the Contractor to administer Force Account Directive, and Contractor shall not be entitled to separately recover additional amounts for overhead and/or profit.

18.5.5 The Contractor shall notify the District or its authorized representative(s) at least twenty-four (24) hours prior to proceeding with any of the force account work. Furthermore, the Contractor shall notify the District when it has consumed eighty percent (80%) of the budget, and shall not exceed the budget unless specifically authorized in writing by the District. The Contractor will not be compensated for force account work in the event that the Contractor fails to timely notify the District regarding the commencement of force account work, or exceeding the force account budget.

18.5.6 The Contractor shall diligently proceed with the work, and on a daily basis, submit a daily force account report using Document 00 63 47, "Daily Force Account Report," no later than 5:00 p.m. each day. The report shall contain a detailed itemization of the daily labor, material, and equipment used on the force account work only. The names of the individuals performing the force account work shall be

included on the daily force account reports. The type and model of equipment shall be identified and listed. The District will review the information contained in the reports, and sign the reports no later than the next work day, and return a copy of the report to the Contractor for their records. The District will not sign, nor will the Contractor receive compensation for work the District cannot verify. The Contractor will provide a weekly force account summary indicating the status of each Force Account Directive in terms of percent complete of the not-to-exceed budget and the estimated percent complete of the work.

18.5.7 In the event the Contractor and the District reach a written agreement on a set cost for the work while the work is proceeding based on a Force Account Directive, the Contractor's signed daily force account reports shall be discontinued and all previously signed reports shall be invalid.

18.6 Price Request

18.6.1 Definition of Price Request

A Price Request is a written request prepared by the Architect requesting the Contractor to submit to the District and the Architect an estimate of the effect of a proposed change in the Work on the Contract Price and the Contract Time.

18.6.2 Scope of Price Request

A Price Request shall contain adequate information, including any necessary Drawings and Specifications, to enable Contractor to provide the cost breakdowns required herein. The Contractor shall not be entitled to any additional compensation for preparing a response to a Price Request, whether ultimately accepted or not.

18.7 Proposed Change Order

18.7.1 Definition of Proposed Change Order

A Proposed Change Order ("PCO") is a written request prepared by the Contractor requesting that the District and the Architect issue a Change Order based upon a proposed change to the Work.

18.7.2 Changes in Contract Price

A PCO shall include breakdowns and backup documentation pursuant to the revisions herein and sufficient, in the District's judgment, to validate any change in Contract Price. In no case shall Contractor or any of its Subcontractors be permitted to reserve rights for additional compensation for Change Order Work.

18.7.3 Changes in Time

A PCO shall also include any changes in time required to complete the Project. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the Construction Schedule as defined in the Contract Documents. The Contractor shall justify the proposed change in time by submittal of a schedule analysis that accurately shows the impact of the change on the critical path of the Construction Schedule ("Time Impact Analysis"). If Contractor fails to request a time extension in a PCO, including the Time Impact Analysis, then the Contractor is thereafter precluded from requesting, and waives any right to request, additional time and/or claim a delay. In no case shall Contractor or any of its Subcontractors be permitted to reserve rights for additional time for Change Order Work. A PCO that leaves the amount of time requested blank, or states that such time requested is "to be determined", is not permitted and shall also constitute a waiver of any right to request additional time and/or claim a delay.

18.7.4 Unknown and/or Unforeseen Conditions

If there is an Allowance, then Contractor must submit a Request for Allowance Expenditure Directive, including supporting documentation as described below, to receive authorization for the release of funds from the Allowance. Allowance Expenditure Directives shall be based on Contractor's costs, without overhead and profit, for products, delivery, installation, labor, insurance, payroll, taxes, bonding and equipment rental will be included in Allowance Expenditure Directive authorizing expenditure of funds from this Allowance. No overhead and profit shall be added to the Allowance Expenditure Directive. If cost of the unforeseen condition(s) exceed the Allowance, Contractor must submit a PCO for amounts in excess of the Allowance requesting an increase in Contract Price and/or Contract Time that is based at least partially on Contractor's assertion that Contractor has encountered unknown and/or unforeseen condition(s) on the Project, then Contractor shall base the PCO on provable information that, beyond a reasonable doubt and to the District's satisfaction, demonstrates that the unknown and/or unforeseen condition(s) were actually unknown and/or unforeseen and that the condition(s) were reasonably unknown and/or unforeseen. If not, the District shall deny the PCO as unsubstantiated, and the Contractor shall complete the Project without any increase in Contract Price and/or Contract Time based on that PCO.

18.7.5 Time to Submit Proposed Change Order

Contractor shall submit its PCO within five (5) working days of the date Contractor discovers, or reasonably should have discovered, the circumstances giving rise to the PCO, unless additional time to submit a PCO is granted in writing by the District. Time is of the essence in Contractor's submission of PCOs so that the District can promptly investigate the basis for the PCO. Accordingly, if Contractor fails to submit its PCO within this timeframe, Contractor waives, releases, and discharges any right to assert or claim any entitlement to an adjustment of the Contract Price and/or Time based on circumstances giving rise to the PCO.

18.7.6 Proposed Change Order Certification

In submitting a PCO, Contractor certifies and affirms that the cost and/or time request is submitted in good faith, that the cost and/or time request is accurate and in accordance with the provisions of the Contract Documents, and the Contractor submits the cost and/or request for extension of time recognizing the significant civil penalties and treble damages which follow from making a false claim or presenting a false claim under Government Code section 12650 et seq.

It is expressly understood that the value of the extra Work or changes expressly includes any and all of the Contractor's costs and expenses, direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project including, without limitation, cumulative impacts. Contractor is not entitled to separately recover amounts for overhead or other indirect costs. Any costs, expenses, damages, or time extensions not included are deemed waived.

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18.8 Format for Proposed Change Order

18.8.1 The following format shall be used as applicable by the District and the Contractor (e.g. Change Orders, PCO's) to communicate proposed additions and deductions to the Contract, supported by attached documentation. Any spaces left blank will be deemed no change to cost or time.

	WORK PERFORMED OTHER THAN BY CONTRACTOR	**ADD**	**DEDUCT**
(a)	**Material** (attach suppliers' invoice or itemized quantity and unit cost plus sales tax)		
(b)	**Add Labor** (attach itemized hours and rates, fully Burdened, and specify the hourly rate for each additional labor burden, for example, payroll taxes, fringe benefits, etc.)		
(c)	**Add Equipment** (attach suppliers' invoice)		
(d)	**Subtotal**		
(e)	**Add Overhead and Profit for any and all tiers of Subcontractor**, the total not to exceed ten percent (10%) of Item (d)		
(f)	**Subtotal**		
(g)	**Add General Conditions Cost** (if Time is Compensable) (attach supporting documentation)		
(h)	**Subtotal**		
(i)	**Add Overhead and Profit for Contractor**, not to exceed five percent (5%) of Item (h)		
(j)	**Subtotal**		
(k)	**Add Bond and Insurance**, not to exceed two percent (2%) of Item (j)		
(l)	**TOTAL**		
(m)	**Time** (zero unless indicated; "TBD" not permitted)	**_____ Calendar Days**	

	WORK PERFORMED BY CONTRACTOR	**ADD**	**DEDUCT**
(n)	**Material** (attach itemized quantity and unit cost plus sales tax)		
(o)	**Add Labor** (attach itemized hours and rates, fully Burdened, and specify the hourly rate for each additional labor burden, for example, payroll taxes, fringe benefits, etc.)		
(p)	**Add Equipment** (attach suppliers' invoice)		
(q)	**Add General Conditions Cost** (if Time is Compensable) (attach supporting documentation)		
(r)	**Subtotal**		
(s)	**Add Overhead and Profit for Contractor**, not to exceed fifteen percent (15%) of Item (e)		
(t)	**Subtotal**		
(u)	**Add Bond and Insurance**, not to exceed two percent (2%) of Item (g)		
(v)	**TOTAL**		
(w)	**Time** (zero unless indicated; "TBD" not permitted)	**_____ Calendar Days**	

18.8.2 Labor. Contractor shall be compensated for the costs of labor actually and directly utilized in the performance of the Work. Such labor costs shall be the actual cost, use of any formulas (e.g. labor factors) is not allowed, not to exceed prevailing wage rates in the locality of the Site and shall be in the labor classification(s) necessary for the performance of the Work, fully Burdened. Labor costs shall exclude costs incurred by the Contractor in preparing estimate(s) of the costs of the change in the Work, in the maintenance of records relating to the costs of the change in the Work, coordination and assembly of materials and information relating to the change in the Work or performance thereof, or the supervision and other overhead and general conditions costs associated with the change in the Work or performance thereof, including but not limited to the cost for the job superintendent. If applicable, District will pay Contractor the reasonable costs for room and board, supported with appropriate backup documentation, without markup for profit or overhead as provided by U.S. General Services Administration per diem rates for California lodging, meals and incidentals, https://www.gsa.gov/travel/plan-book/per-diem-rates/per-diem-rates-lookup.

18.8.3 Materials. Contractor shall be compensated for the costs of materials necessarily and actually used or consumed in connection with the performance of the change in the Work. Costs of materials may include reasonable costs of transportation from a source closest to the Site of the Work and delivery to the Site. If discounts by material suppliers are available for materials necessarily used in the performance of the change in the Work, they shall be credited to the District. If materials necessarily used in the performance of the change in the Work are obtained from a supplier or source owned in whole or in part by the Contractor, compensation therefor shall not exceed the current wholesale price for such materials. If, in the reasonable opinion of the District, the costs asserted by the Contractor for materials in connection with any change in the Work are excessive, or if the Contractor fails to provide satisfactory evidence of the actual costs of such materials from its supplier or vendor of the same, the costs of such materials and the District's obligation to pay for the same shall be limited to the then lowest wholesale price at which similar materials are available in the quantities required to perform the change in the Work. The District may elect to furnish materials for the change in the Work, in which event the Contractor shall not be compensated for the costs of furnishing such materials or any mark-up thereon.

18.8.4 Equipment. As a precondition to the District's duty to pay for Equipment rental or loading and transportation, Contractor shall provide satisfactory evidence of the actual costs of Equipment from the supplier, vendor or rental agency of same. Contractor shall be compensated for the actual cost of the necessary and direct use of Equipment in the performance of the change in the Work. Use of such Equipment in the performance of the change in the Work shall be compensated in increments of fifteen (15) minutes. Rental time for Equipment moved by its own power shall include time required to move such Equipment to the site of the Work from the nearest available rental source of the same. If Equipment is not moved to the Site by its own power, Contractor will be compensated for the loading and transportation costs in lieu of rental time. The foregoing notwithstanding, neither moving time or loading and transportation time shall be allowed if the Equipment is used for performance of any portion of the Work other than the change in the Work. Unless prior approval in writing is obtained by the Contractor from the Architect, the Project Inspector and the District, no costs or compensation shall be allowed for time while Construction Equipment is inoperative, idle or on standby, for any reason. Contractor shall not be entitled to an allowance or any other compensation for

Equipment or tools used in the performance of change in the Work where such Equipment or tools have a replacement value of $500.00 or less. Equipment costs claimed by the Contractor in connection with the performance of any Work shall not exceed rental rates established by distributors or construction equipment rental agencies in the locality of the Site; any costs asserted which exceed such rental rates shall not be allowed or paid. Unless otherwise specifically approved in writing by the Architect, the Project Inspector and the District, the allowable rate for the use of Equipment in connection with the Work shall constitute full compensation to the Contractor for the cost of rental, fuel, power, oil, lubrication, supplies, necessary attachments, repairs or maintenance of any kind, depreciation, storage, insurance, labor (exclusive of labor costs of the Equipment operator), and any and all other costs incurred by the Contractor incidental to the use of such Equipment.

18.8.5 General Conditions Cost. The phrase "General Conditions Cost" shall mean, other than expressly limited or excluded herein, the costs of Contractor during the construction phase, including but not limited to: payroll costs for project manager for Work conducted at the Site, payroll costs for the superintendent and full-time general foremen, workers not included as direct labor costs engaged in support functions (e.g., loading/unloading, clean-up), costs of offices and temporary facilities including office materials, office supplies, office equipment, minor expenses, utilities, fuel, sanitary facilities and telephone services at the Site, costs of consultants not in the direct employ of Contractor or Subcontractors, and fees for permits and licenses.

18.8.6 Overhead and Profit. The phrase "Overhead and Profit" shall include field and office supervisors and assistants, watchperson, use of small tools, consumable, insurance other than construction bonds and insurance required herein, general conditions costs and home office expenses.

18.9 Change Order Certification

18.9.1 All Change Orders and PCOs include the following certification by the Contractor, either in the form specifically or incorporated by this reference:

18.9.1.1 The undersigned Contractor approves the foregoing as to the changes, if any, to the Contract Price specified for each item, and as to the extension of time allowed, if any, for completion of the entire Work as stated herein, and agrees to furnish all labor, materials, and service, and perform all work necessary to complete any additional work specified for the consideration stated herein. Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650 et seq. It is understood that the changes herein to the Contract shall only be effective when approved by the governing board of the District.

18.9.1.2 It is expressly understood that the value of the extra Work or changes expressly includes any and all of the Contractor's costs and expenses, direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project including, without limitation, cumulative impacts. Contractor is not entitled to separately recover amounts for overhead or other indirect costs. Any costs, expenses, damages, or time extensions not included are deemed waived.

18.9.2 Accord and Satisfaction: Contractor's execution of any Change Order shall constitute a full accord and satisfaction, and release, of all Contractor (and if applicable, Subcontractor) claims for additional time, money or other relief arising from or relating to the subject matter of the change including, without limitation, impacts of all types, cumulative impacts, inefficiency, overtime, delay and any other type of claim.

18.10 Determination of Change Order Cost

18.10.1 The amount of the increase or decrease in the Contract Price from a Change Order, if any, shall be determined in one or more of the following ways as applicable to a specific situation and at the District's discretion:

18.10.1.1 District acceptance of a PCO;

18.10.1.2 By unit prices contained in Contractor's original bid;

18.10.1.3 By agreement between District and Contractor.

18.11 Deductive Change Orders

All deductive Change Order(s) must be prepared pursuant to the provisions herein. Where a portion of the Work is deleted from the Contract, the reasonable value of the deducted work less the value of work performed shall be considered the appropriate deduction. The value submitted on the Schedule of Values shall be used to calculate the credit amount unless the bid documentation is being held in escrow as part of the Contract Documents. Unit Prices, if any, may be used in District's discretion in calculating reasonable value. If Contractor offers a proposed amount for a deductive Change Order(s), Contractor shall include a minimum of five percent (5%) total profit and overhead to be deducted with the amount of the work of the Change Order(s). If Subcontractor work is involved, Subcontractors shall also include a minimum of five percent (5%) profit and overhead to be deducted with the amount of its deducted work. Any deviation from this provision shall not be allowed.

18.12 Addition or Deletion of Alternate Bid Item(s)

If the Bid Form and Proposal includes proposal(s) for Alternate Bid Item(s), during Contractor's performance of the Work, the District may elect to add or delete any such Alternate Bid Item(s) if not included in the Contract at the time of award. If the District elects to add or delete Alternate Bid Item(s) after Contract award, the cost or credit for such Alternate Bid Item(s) shall be as set forth in the Bid Form and Proposal unless the parties agree to a different price and the Contract Time shall be adjusted by the number of days allocated in the Contract Documents. If days are not allocated in the Contract Documents, the Contract Time shall be equitably adjusted.

18.13 Discounts, Rebates, and Refunds

For purposes of determining the cost, if any, of any change, addition, or omission to the Work hereunder, all trade discounts, rebates, refunds, and all returns from the sale of surplus materials and equipment shall accrue and be credited to the Contractor, and the Contractor shall make provisions so that such discounts, rebates, refunds, and returns may be secured, and the amount thereof shall be allowed as a reduction of the Contractor's cost in determining the actual cost of construction for purposes of any change, addition, or omission in the Work as provided herein.

18.14 Accounting Records

With respect to portions of the Work performed by Change Orders and Construction Change Directives, the Contractor shall keep and maintain cost-accounting records satisfactory to the District, including, without limitation, Job Cost Reports as provided in these General Conditions, which shall be available to the District on the same terms as any other books and records the Contractor is required to maintain under the Contract Documents. Such records shall include without limitation hourly records for Labor and Equipment and itemized

records of materials and Equipment used that day in connection with the performance of any Work. All records maintained hereunder shall be subject to inspection, review and/or reproduction by the District, the Architect or the Project Inspector upon request. In the event that the Contractor fails or refuses, for any reason, to maintain or make available for inspection, review and/or reproduction such records, the District's reasonable good faith determination of the extent of adjustment to the Contract Price shall be final, conclusive, dispositive and binding upon Contractor.

18.15 Notice Required

If the Contractor desires to make a claim for an increase in the Contract Price, or any extension in the Contract Time for completion, it shall notify the District pursuant to the provisions herein, including the Article on Claims and Disputes. No claim shall be considered unless made in accordance with this subparagraph. Contractor shall proceed to execute the Work even though the adjustment may not have been agreed upon. Any change in the Contract Price or extension of the Contract Time resulting from such claim shall be authorized by a Change Order.

18.16 Applicability to Subcontractors

Any requirements under this Article shall be equally applicable to Change Orders or Construction Change Directives issued to Subcontractors by the Contractor to the extent as required by the Contract Documents.

18.17 Alteration to Change Order Language

Contractor shall not alter Change Orders or reserve time in Change Orders. Change Orders altered in violation of this provision, if in conflict with the terms set forth herein, shall be construed in accordance with the terms set forth herein. Contractor shall execute finalized Change Orders and proceed under the provisions herein with proper notice.

18.18 Failure of Contractor to Execute Change Order

Contractor shall be in default of the Contract if Contractor fails to execute a Change Order when the Contractor agrees with the addition and/or deletion of the Work in that Change Order.

19. REQUEST FOR INFORMATION

19.1 Any Request for Information shall reference all applicable Contract Document(s), including Specification section(s), detail(s), page number(s), drawing number(s), and sheet number(s), etc. The Contractor shall make suggestions and interpretations of the issue raised by each Request for Information. A Request for Information cannot modify the Contract Price, Contract Time, or the Contract Documents. Upon request by the District, Contractor shall provide an electronic copy of the Request for Information in addition to the hard copy.

19.2 The Contractor shall be responsible for any costs incurred for professional services that District may deduct from any amounts owing to the Contractor, if a Request for Information requests an interpretation or decision of a matter where the information sought is equally available to the party making the request. District, at its sole discretion, shall deduct from and/or invoice Contractor for all the professional services arising herein.

20. PAYMENTS

20.1 Contract Price

The Contract Price is stated in the Agreement and, including authorized adjustments, is the total amount payable by the District to the Contractor for performance of the Work under the Contract Documents.

20.2 Applications for Progress Payments

20.2.1 Procedure for Applications for Progress Payments

20.2.1.1 Application for Progress Payment

20.2.1.1.1 Not before the fifth (5th) day of each calendar month during the progress of the Work, Contractor shall submit to the District and the Architect an itemized Application for Payment for operations completed in accordance with the Schedule of Values. Such application shall be notarized, if required, and supported by the following or each portion thereof unless waived by the District in writing:

20.2.1.1.1.1 The amount paid to the date of the Application to the Contractor, to all its Subcontractors, and all others furnishing labor, material, or equipment for its Contract;

20.2.1.1.1.2 The amount being requested under the Application for Payment by the Contractor on its own behalf and separately stating the amount requested on behalf of each of the Subcontractors and all others furnishing labor, material, and equipment under the Contract;

20.2.1.1.1.3 The balance that will be due to each of such entities after said payment is made;

20.2.1.1.1.4 A certification that the As-Built Drawings and annotated Specifications are current;

20.2.1.1.1.5 Itemized breakdown of work done for the purpose of requesting partial payment;

20.2.1.1.1.6 An updated and acceptable construction schedule in conformance with the provisions herein;

20.2.1.1.1.7 The additions to and subtractions from the Contract Price and Contract Time;

20.2.1.1.1.8 A total of the retentions held;

20.2.1.1.1.9 Material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the District may require from time to time;

20.2.1.1.1.10 The percentage of completion of the Contractor's Work by line item;

20.2.1.1.1.11 Schedule of Values updated from the preceding Application for Payment;

20.2.1.1.1.12 A duly completed and executed conditional waiver and release upon progress payment compliant with Civil Code section 8132 from the Contractor and each subcontractor of any tier and supplier to be paid from the current progress payment;

20.2.1.1.1.13 A duly completed and executed unconditional waiver and release upon progress payment compliant with Civil Code section 8134 from the Contractor and each subcontractor of any tier and supplier that was paid from the previous progress payment(s); and

20.2.1.1.1.14 A certification by the Contractor of the following:

The Contractor warrants title to all Work performed as of the date of this payment application has been completed in accordance with the Contract Documents for the Project. The Contractor further warrants that all amounts have been paid for work which previous Certificates for Payment were issued and payments received and all Work performed as of the date of this payment application is free and clear of liens, claims, security interests, or encumbrances in favor of the Contractor, Subcontractors, material and equipment suppliers, workers, or other persons or entities making a claim by reason of having provided labor, materials, and equipment relating to the Work, except those of which the District has been informed. Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650 et seq.

20.2.1.1.1.15 The Contractor shall be subject to the False Claims Act set forth in Government Code section 12650 et seq. for information provided with any Application for Progress Payment.

20.2.1.1.1.16 All remaining certified payroll records ("CPR(s)") for each journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work for the period of the Application for Payment. As indicated herein, the District shall not make any payment to Contractor until:

20.2.1.1.1.16.1 Contractor and/or its Subcontractor(s) provide electronic CPRs directly to the DIR on no less than every 30 days while Work is being performed and within 30 days after the final day of Work performed on the Project for any journeyman, apprentice, worker or other employee was employed in connection with the Work, or within ten (10) days of any request by the District or the DIR to the requesting entity, and

20.2.1.1.1.16.2 Any delay in Contractor and/or its Subcontractor(s) providing CPRs in a timely manner may directly delay the Contractor's payment.

20.2.1.1.2 Applications received after June 20th will not be paid until the second week of July and applications received after December 12th will not be paid until the first week of January.

20.2.2 <u>Prerequisites for Progress Payments</u>

20.2.2.1 <u>First Payment Request</u>: The following items, if applicable, must be completed before the District will accept and/or process the Contractor's first payment request:

20.2.2.1.1 Installation of the Project sign;

20.2.2.1.2 Installation of field office;

20.2.2.1.3 Installation of temporary facilities and fencing;

20.2.2.1.4 Schedule of Values;

20.2.2.1.5 Contractor's Construction Schedule;

20.2.2.1.6 Schedule of unit prices, if applicable;

20.2.2.1.7 Submittal Schedule;

20.2.2.1.8 Receipt by Architect of all submittals due as of the date of the payment application;

20.2.2.1.9 Copies of necessary permits;

20.2.2.1.10 Copies of authorizations and licenses from governing authorities;

20.2.2.1.11 Initial progress report;

20.2.2.1.12 Surveyor qualifications;

20.2.2.1.13 Written acceptance of District's survey of rough grading, if applicable;

20.2.2.1.14 List of all Subcontractors, with names, license numbers, telephone numbers, and Scope of Work;

20.2.2.1.15 All bonds and insurance endorsements; and

20.2.2.1.16 Resumes of Contractor's project manager, and if applicable, job site secretary, record documents recorder, and job site superintendent.

20.2.2.2 Second Payment Request: The District will not process the second payment request until and unless all submittals and Shop Drawings have been accepted for review by the Architect.

20.2.2.3 No Waiver of Criteria: Any payments made to Contractor where criteria set forth herein have not been met shall not constitute a waiver of said criteria by District. Instead, such payment shall be construed as a good faith effort by District to resolve differences so Contractor may pay its Subcontractors and suppliers. Contractor agrees that failure to submit such items may constitute a breach of contract by Contractor and may subject Contractor to termination.

20.3 Progress Payments

20.3.1 District's Approval of Application for Payment

20.3.1.1 Upon receipt of an Application for Payment, The District shall act in accordance with both of the following:

20.3.1.1.1 Each Application for Payment shall be reviewed by the District as soon as practicable after receipt for the purpose of determining that the Application for Payment is a proper Application for Payment.

20.3.1.1.2 Any Application for Payment determined not to be a proper Application for Payment suitable for payment shall be returned to the Contractor as soon as practicable, but not later than seven (7) days, after receipt. An Application for Payment returned pursuant to this paragraph shall

be accompanied by a document setting forth in writing the reasons why the Application for Payment is not proper. The number of days available to the District to make a payment without incurring interest pursuant to this section shall be reduced by the number of days by which the District exceeds this seven-day return requirement.

20.3.1.1.3 An Application for Payment shall be considered properly executed if funds are available for payment of the Application for Payment, and payment is not delayed due to an audit inquiry by the financial officer of the District.

20.3.1.2 The District's review of the Contractor's Application for Payment will be based on the District's and the Architect's observations at the Site and the data comprising the Application for Payment that the Work has progressed to the point indicated and that, to the best of the District's and the Architect's knowledge, information, and belief, the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to:

20.3.1.2.1 Observation of the Work for general conformance with the Contract Documents,

20.3.1.2.2 Results of subsequent tests and inspections,

20.3.1.2.3 Minor deviations from the Contract Documents correctable prior to completion, and

20.3.1.2.4 Specific qualifications expressed by the Architect.

20.3.1.3 District's approval of the certified Application for Payment shall be based on Contractor complying with all requirements for a fully complete and valid certified Application for Payment.

20.3.2 Payments to Contractor

20.3.2.1 Within thirty (30) days after approval of the Application for Payment, Contractor shall be paid a sum equal to ninety-five percent (95%) of the value of the Work performed (as verified by Architect and Inspector and certified by Contractor) up to the last day of the previous month, less the aggregate of previous payments and amount to be withheld. The value of the Work completed shall be Contractor's best estimate. No inaccuracy or error in said estimate shall operate to release the Contractor, or any Surety upon any bond, from damages arising from such Work, or from the District's right to enforce each and every provision of this Contract, and the District shall have the right subsequently to correct any error made in any estimate for payment.

20.3.2.2 The Contractor shall not be entitled to have any payment requests processed, or be entitled to have any payment made for Work performed, so long as any lawful or proper direction given by the District concerning the Work, or any portion thereof, remains incomplete.

20.3.2.3 If the District fails to make any progress payment within thirty (30) days after receipt of an undisputed and properly submitted Application for Payment from the Contractor, the District shall pay interest to the Contractor

equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.

20.3.3 No Waiver

No payment by District hereunder shall be interpreted so as to imply that District has inspected, approved, or accepted any part of the Work. Notwithstanding any payment, the District may enforce each and every provision of this Contract. The District may correct or require correction of any error subsequent to any payment.

20.4 Decisions to Withhold Payment

20.4.1 Reasons to Withhold Payment

The District may withhold payment in whole, or in part, to the extent reasonably necessary to protect the District if, in the District's opinion, the representations to the District required herein cannot be made. The District may withhold payment, in whole, or in part, to such extent as may be necessary to protect the District from loss because of, but not limited to any of the following:

20.4.1.1 Defective Work not remedied within **FORTY-EIGHT (48)** hours of written notice to Contractor.

20.4.1.2 Stop Payment Notices or other liens served upon the District as a result of the Contract. Contractor agrees that the District may withhold up to 125% of the amount claimed in the Stop Payment Notice to answer the claim and to provide for the District's reasonable cost of any litigation pursuant to the stop payment notice.

20.4.1.3 Written notice to withhold payment from Contractor by payment and/or performance bond surety(ies).

20.4.1.4 Liquidated damages assessed against the Contractor.

20.4.1.5 The cost of completion of the Contract if there exists a reasonable doubt that the Work can be completed for the unpaid balance of the Contract Price or by the completion date.

20.4.1.6 Damage to the District or other contractor(s).

20.4.1.7 Unsatisfactory prosecution of the Work by the Contractor.

20.4.1.8 Failure to store and properly secure materials.

20.4.1.9 Failure of the Contractor to submit, on a timely basis, proper, sufficient, and acceptable documentation required by the Contract Documents, including, without limitation, a Construction Schedule, Schedule of Submittals, Schedule of Values, Monthly Progress Schedules, Shop Drawings, Product Data and samples, Proposed product lists, executed Change Orders, and/or verified reports.

20.4.1.10 Failure of the Contractor to maintain As-Built Drawings.

20.4.1.11 Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment.

20.4.1.12 Unauthorized deviations from the Contract Documents.

20.4.1.13 Failure of the Contractor to prosecute the Work in a timely manner in compliance with the Construction Schedule, established progress schedules, and/or completion dates.

20.4.1.14 Failure to provide acceptable electronic certified payroll records, as required by the Labor Code, by these Contract Documents, or by written request; for each journeyman, apprentice, worker, or other employee employed by the Contractor and/or by each Subcontractor in connection with the Work for the period of the Application for Payment or if payroll records are delinquent or inadequate.

20.4.1.15 Failure to properly pay prevailing wages as required in Labor Code section 1720 et seq., failure to comply with any other Labor Code requirements, and/or failure to comply with labor compliance monitoring and enforcement by the DIR.

20.4.1.16 Allowing an unregistered subcontractor, as described in Labor Code section 1725.5, to engage in the performance of any work under this Contract.

20.4.1.17 Failure to comply with any applicable federal statutes and regulations regarding minimum wages, withholding, payrolls and basic records, apprentice and trainee employment requirements, equal employment opportunity requirements, Copeland Act requirements, Davis-Bacon Act and related requirements, Contract Work Hours and Safety Standards Act requirements, if applicable.

20.4.1.18 Failure to properly maintain or clean up the Site.

20.4.1.19 Failure to timely indemnify, defend, or hold harmless the District.

20.4.1.20 Any payments due to the District, including but not limited to payments for failed tests, utilities changes, or permits.

20.4.1.21 Failure to pay Subcontractor(s) or supplier(s) as required by law and by the Contract Documents.

20.4.1.22 Failure to pay any royalty, license or similar fees.

20.4.1.23 Contractor is otherwise in breach, default, or in substantial violation of any provision of this Contract.

20.4.1.24 Failure to perform any implementation and/or monitoring required by any SWPPP for the Project and/or the imposition of any penalties or fines therefore whether imposed on the District or Contractor.

20.4.2 Reallocation of Withheld Amounts

20.4.2.1 District may, in its discretion, apply any withheld amount to pay outstanding claims or obligations as defined herein. In so doing, District shall make such payments on behalf of Contractor. If any payment is so made by District, then that amount shall be considered a payment made under Contract

by District to Contractor and District shall not be liable to Contractor for any payment made in good faith. These payments may be made without prior judicial determination of claim or obligation. District will render Contractor an accounting of funds disbursed on behalf of Contractor.

20.4.2.2 If Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents or fails to perform any provision thereof, District may, after **FORTY-EIGHT (48)** hours' written notice to the Contractor and, without prejudice to any other remedy, make good such deficiencies. The District shall adjust the total Contract Price by reducing the amount thereof by the cost of making good such deficiencies. If District deems it inexpedient to correct Work that is damaged, defective, or not done in accordance with Contract provisions, an equitable reduction in the Contract Price (of at least one hundred fifty percent (150%) of the estimated reasonable value of the nonconforming Work) shall be made therefor.

20.4.3 Payment After Cure

When Contractor removes the grounds for declining approval, payment shall be made for amounts withheld because of them. No interest shall be paid on any retainage or amounts withheld due to the failure of the Contractor to perform in accordance with the terms and conditions of the Contract Documents.

20.5 Subcontractor Payments

20.5.1 Payments to Subcontractors

No later than seven (7) days after receipt, or pursuant to Business and Professions Code section 7108.5 and Public Contract Code section 7107, the Contractor shall pay to each Subcontractor, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to its Sub-subcontractors in a similar manner.

20.5.2 No Obligation of District for Subcontractor Payment

The District shall have no obligation to pay, or to see to the payment of, money to a Subcontractor except as may otherwise be required by law.

20.5.3 Joint Checks

District shall have the right in its sole discretion, if necessary for the protection of the District, to issue joint checks made payable to the Contractor and Subcontractors and/or material or equipment suppliers. The joint check payees shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. In no event shall any joint check payment be construed to create any contract between the District and a Subcontractor of any tier, or a material or equipment supplier, any obligation from the District to such Subcontractor or a material or equipment supplier, or rights in such Subcontractor or a material or equipment supplier against the District.

21. COMPLETION OF THE WORK

21.1 Completion

21.1.1 District will accept completion of Contract and have the Notice of Completion recorded when the entire Work shall have been completed to the satisfaction of District.

21.1.2 The Work may only be accepted as complete by action of the governing board of the District.

21.1.3 District, at its sole option, may accept completion of Contract and have the Notice of Completion recorded when the entire Work shall have been completed to the satisfaction of District, except for minor corrective items, as distinguished from incomplete items. If Contractor fails to complete all minor corrective items within fifteen (15) days after the date of the District's acceptance of completion, District shall withhold from the final payment one hundred fifty percent (150%) of an estimate of the amount sufficient to complete the corrective items, as determined by District, until the item(s) are completed.

21.1.4 At the end of the 15-day period, if there are any items remaining to be corrected, District may elect to proceed as provided herein related to adjustments to Contract Price, and/or District's right to perform the Work of the Contractor.

21.2 Close-Out/Certification Procedures

21.2.1 Punch List

The Contractor shall notify the Architect when Contractor considers the Work complete. Upon notification, Architect will prepare a list of minor items to be completed or corrected ("Punch List"). The Contractor and/or its Subcontractors shall proceed promptly to complete and correct items on the Punch List. Failure to include an item on Punch List does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

21.2.2 Close-Out/Certification Requirements

21.2.2.1 Utility Connections

Buildings shall be connected to water, gas, sewer, and electric services, complete and ready for use. Service connections shall be made and existing services reconnected.

21.2.2.2 Record Drawings and Record Specifications

21.2.2.2.1 Contractor shall provide exact Record Drawings of the Work ("As-Builts") and Record Specifications upon completion of the Project and as a condition precedent to approval of final payment.

21.2.2.2.2 Contractor shall obtain the Inspector's approval of the corrected prints and employ a competent draftsman to transfer the Record Drawings information to the most current version of AutoCAD that is, at that time, currently utilized for plan check submission by either the District, the Architect, OPSC, and/or DSA, and print a complete set of transparent sepias. When completed, Contractor shall deliver corrected sepias and diskette/CD/other data storage device acceptable to District with AutoCAD file to the District.

21.2.2.2.3 Contractor is liable and responsible for any and all inaccuracies in the Record Drawings and Record Specifications, even if inaccuracies become evident at a future date.

21.2.2.3 Construction Storm Water Permit, if applicable

Contractor shall submit to District all electronic or hard copy records required by the Construction Storm Water Permit, if applicable, within seven (7) days of Completion of the Project.

21.2.2.4 Maintenance Manuals: Contractor shall prepare all operation and maintenance manuals and date as indicated in the Specifications.

21.2.2.5 Source Programming: Contractor shall provide all source programming for all items in the Project.

21.2.2.6 Verified Reports: Contractor shall completely and accurately fill out and file forms DSA 6-C or DSA 152 (or current form), as appropriate. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

21.3 Final Inspection

21.3.1 Contractor shall comply with Punch List procedures as provided herein, and maintain the presence of a Project Superintendent and Project Manager until the Punch List is complete to ensure proper and timely completion of the Punch List. Under no circumstances shall Contractor demobilize its forces prior to completion of the Punch List without District's prior written approval. Upon receipt of Contractor's written notice that all of the Punch List items have been fully completed and the Work is ready for final inspection and District acceptance, Architect and Project Inspector will inspect the Work and shall submit to Contractor and District a final inspection report noting the Work, if any, required in order to complete in accordance with the Contract Documents. Absent unusual circumstances, this report shall consist of the Punch List items not yet satisfactorily completed.

21.3.2 Upon Contractor's completion of all items on the Punch List and any other uncompleted portions of the Work, the Contractor shall notify the District and Architect, who shall again inspect such Work. If the Architect finds the Work complete and acceptable under the Contract Documents, the Architect will notify Contractor, who shall then jointly submit to the Architect and the District its final Application for Payment.

21.3.3 Final Inspection Requirements

21.3.3.1 Before calling for final inspection, Contractor shall determine that the following have been performed:

21.3.3.1.1 The Work has been completed.

21.3.3.1.2 All life safety items are completed and in working order.

21.3.3.1.3 Mechanical and electrical Work including, without limitation, security system, data, and fire alarm, are complete and tested, fixtures are in place, connected, and ready for tryout.

21.3.3.1.4 Electrical circuits scheduled in panels and disconnect switches labeled.

21.3.3.1.5 Painting and special finishes complete.

21.3.3.1.6 Doors complete with hardware, cleaned of protective film, relieved of sticking or binding, and in working order.

21.3.3.1.7 Tops and bottoms of doors sealed.

21.3.3.1.8 Floors waxed and polished as specified.

21.3.3.1.9 Broken glass replaced and glass cleaned.

21.3.3.1.10 Grounds cleared of Contractor's equipment, raked clean of debris, and trash removed from Site.

21.3.3.1.11 Work cleaned, free of stains, scratches, and other foreign matter, and damaged and broken material replaced.

21.3.3.1.12 Finished and decorative work shall have marks, dirt, and superfluous labels removed.

21.3.3.1.13 Final cleanup, as provided herein.

21.4 Costs of Multiple Inspections

More than two (2) requests of the District to make a final inspection shall be considered an additional service of District, Architect, Construction Manager, and/or Project Inspector, and all subsequent costs will be invoiced to Contractor and if funds are available, withheld from remaining payments.

21.5 Partial Occupancy or Use Prior to Completion

21.5.1 District's Rights to Occupancy

The District may occupy or use any completed or partially completed portion of the Work at any stage, and such occupancy shall not constitute the District's Final Acceptance of any part of the Work. Neither the District's Final Acceptance, the making of Final Payment, any provision in Contract Documents, nor the use or occupancy of the Work, in whole or in part, by District shall constitute acceptance of Work not in accordance with the Contract Documents nor relieve the Contractor or the Contractor's Performance Bond Surety from liability with respect to any warranties or responsibility for faulty or defective Work or materials, equipment and workmanship incorporated therein. In the event that the District occupies or uses any completed or partially completed portion of the Work, the Contractor shall remain responsible for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents unless the Contractor requests in writing, and the District agrees, to otherwise divide those responsibilities. Any dispute as to responsibilities shall be resolved pursuant to the Claims and Disputes provisions herein, with the added provision that during the dispute process, the District shall have the right to occupy or use any portion of the Work that it needs or desires to use.

21.5.2 Inspection Prior to Occupancy or Use

Immediately prior to partial occupancy or use, the District, the Contractor, and the Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

21.5.3 No Waiver

Unless otherwise agreed upon, partial or entire occupancy or use of a portion or portions of the Work shall not constitute beneficial occupancy or District's acceptance of the Work not complying with the requirements of the Contract Documents.

22. FINAL PAYMENT AND RETENTION

22.1 Final Payment

Upon receipt and approval of a valid and final Application for Payment, the Architect will issue a final Certificate of Payment. The District shall thereupon jointly inspect the Work and either accept the Work as complete or notify the Architect and the Contractor in writing of reasons why the Work is not complete. Upon District's acceptance of the Work of the Contractor as fully complete by the Governing Board of the District (that, absent unusual circumstances, will occur when the Punch List items have been satisfactorily completed), the District shall record a Notice of Completion with the County Recorder, and the Contractor shall, upon receipt of final payment from the District, pay the amount due Subcontractors.

22.2 Prerequisites for Final Payment

The following conditions must be fulfilled prior to Final Payment:

22.2.1 A full release of all Stop Payment Notices served in connection with the Work shall be submitted by Contractor.

22.2.2 A duly completed and executed conditional waiver and release upon final payment compliant with Civil Code section 8136, from the Contractor and each subcontractor of any tier and supplier to be paid from the final payment.

22.2.3 A duly completed and executed unconditional waiver and release upon progress payment compliant with Civil Code section 8134, from the Contractor and each subcontractor of any tier and supplier that was paid from the previous progress payments.

22.2.4 A duly completed and executed Document 00 65 19.26, "AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS" from the Contractor.

22.2.5 The Contractor shall have made all corrections to the Work that are required to remedy any defects therein, to obtain compliance with the Contract Documents or any requirements of applicable codes and ordinances, or to fulfill any of the orders or directions of District required under the Contract Documents.

22.2.6 Each Subcontractor shall have delivered to the Contractor all written guarantees, warranties, applications, and bonds required by the Contract Documents for its portion of the Work.

22.2.7 Contractor must have completed all requirements set forth under "Close-Out/Certification Procedures," including, without limitation, submission of an approved set of complete Record Drawings.

22.2.8 Architect shall have issued its written approval that final payment can be made.

22.2.9 The Contractor shall have delivered to the District all manuals and materials required by the Contract Documents, which must be approved by the District.

22.2.10 The Contractor shall have completed final clean-up as provided herein.

22.3 Retention

22.3.1 The retention, less any amounts disputed by the District or that the District has the right to withhold pursuant to provisions herein, shall be paid:

22.3.1.1 After approval by the Architect of the Application and Certificate of Payment,

22.3.1.2 After the satisfaction of the conditions set forth herein, and

22.3.1.3 After forty-five (45) days after the recording of the Notice of Completion by District.

22.3.2 No interest shall be paid on any retention, or on any amounts withheld due to a failure of the Contractor to perform, in accordance with the terms and conditions of the Contract Documents, except as provided to the contrary in any Escrow Agreement between the District and the Contractor pursuant to Public Contract Code section 22300.

22.4 Substitution of Securities

The District will permit the substitution of securities in accordance with the provisions of Public Contract Code section 22300.

23. UNCOVERING OF WORK

If a portion of the Work is covered without Inspector or Architect approval or not in compliance with the Contract Documents, it must, if required in writing by the District, the Project Inspector, or the Architect, be uncovered for the Project Inspector's or the Architect's observation and be corrected, replaced, and/or recovered at the Contractor's expense without change in the Contract Price or Contract Time.

24. NONCONFORMING WORK AND CORRECTION OF WORK

24.1 Nonconforming Work

24.1.1 Contractor shall promptly remove from Premises all Work identified by District as failing to conform to the Contract Documents whether incorporated or not. Contractor shall promptly replace and re-execute its own Work to comply with the Contract Documents without additional expense to the District and shall bear the expense of making good all work of other contractors destroyed or damaged by any removal or replacement pursuant hereto and/or any delays to the District or other Contractors caused thereby.

24.1.2 If Contractor does not remove Work that District has identified as failing to conform to the Contract Documents within a reasonable time, not to exceed **FORTY-EIGHT (48)** hours, District may remove it and may store any material at Contractor's expense. If Contractor does not pay expense(s) of that removal within ten (10) days' time thereafter, District may, upon ten (10) days' written notice, sell any material at auction or at private sale and shall deduct all costs and expenses incurred by the District and/or District may withhold those amounts from payment(s) to Contractor.

24.2 Correction of Work

24.2.1 Correction of Rejected Work

Pursuant to the notice provisions herein, the Contractor shall immediately correct the Work rejected by the District, the Architect, or the Project Inspector as failing to conform to the requirements of the Contract Documents, whether observed before or after Completion and whether or not fabricated, installed, or completed. The Contractor shall bear costs of correcting the rejected Work, including additional testing, inspections, and compensation for the Inspector's or the Architect's services and expenses made necessary thereby.

24.2.2 One-Year Warranty Corrections

If, within one (1) year after the date of Completion of the Work or a designated portion thereof, or after the date for commencement of warranties established hereunder, or by the terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the District to do so. This period of one (1) year shall be extended with respect to portions of the Work first performed after Completion by the period of time between Completion and the actual performance of the Work. This obligation hereunder shall survive District's acceptance of the Work under the Contract and termination of the Contract. The District shall give such notice promptly after discovery of the condition.

24.3 District's Right to Perform Work

24.3.1 If the Contractor should neglect to prosecute the Work properly or fail to perform any provisions of this contract, the District, after **FORTY-EIGHT (48)** hours' written notice to the Contractor, may, without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

24.3.2 If it is found at any time, before or after completion of the Work, that Contractor has varied from the Drawings and/or Specifications, including, but not limited to, variation in material, quality, form, or finish, or in the amount or value of the materials and labor used, District may require at its option:

24.3.2.1 That all such improper Work be removed, remade or replaced, and all work disturbed by these changes be made good by Contractor at no additional cost to the District;

24.3.2.2 That the District deduct from any amount due Contractor the sum of money equivalent to the difference in value between the work performed and that called for by the Drawings and Specifications; or

24.3.2.3 That the District exercise any other remedy it may have at law or under the Contract Documents, including but not limited to the District hiring its own forces or another contractor to replace the Contractor's nonconforming Work, in which case the District shall either issue a deductive Change Order, a Construction Change Directive, or invoice the Contractor for the cost of that work. Contractor shall pay any invoices within thirty (30) days of receipt of same or District may withhold those amounts from payment(s) to Contractor.

25. TERMINATION AND SUSPENSION

25.1 District's Request for Assurances

If District at any time reasonably believes Contractor is or may be in default under this Contract, District may in its sole discretion notify Contractor of this fact and request written assurances from Contractor of performance of Work and a written plan from Contractor to remedy any potential default under the terms this Contract that the District may advise Contractor of in writing. Contractor shall, within ten (10) calendar days of District's request, deliver a written cure plan that meets the District's requirements in its request for assurances. Contractor's failure to provide such written assurances of performance and the required written plan, within ten (10) calendar days of request, will constitute a material breach of this Contract sufficient to justify termination for cause.

25.2 District's Right to Terminate Contractor for Cause

25.2.1 Grounds for Termination: The District, in its sole discretion, may terminate the Contract and/or terminate the Contractor's right to perform the work of the Contract based upon any of the following:

25.2.1.1 Contractor refuses or fails to execute the Work or any separable part thereof with sufficient diligence as will ensure its completion within the time specified or any extension thereof, or

25.2.1.2 Contractor fails to complete said Work within the time specified or any extension thereof, or

25.2.1.3 Contractor persistently fails or refuses to perform Work or provide material of sufficient quality as to be in compliance with Contract Documents; or

25.2.1.4 Contractor persistently refuses, or repeatedly fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials to complete the Work in the time specified; or

25.2.1.5 Contractor fails to make prompt payment to Subcontractors, or for material, or for labor; or

25.2.1.6 Contractor persistently disregards laws, or ordinances, or instructions of District; or

25.2.1.7 Contractor fails to supply labor, including that of Subcontractors, that is sufficient to prosecute the Work or that can work in harmony with all other elements of labor employed or to be employed on the Work; or

25.2.1.8 Contractor or its Subcontractor(s) is/are otherwise in breach, default, or in substantial violation of any provision of this Contract, including but not limited to a lapse in licensing or registration.

25.2.2 Notification of Termination

25.2.2.1 Upon the occurrence at District's sole determination of any of the above conditions, District may, without prejudice to any other right or remedy,

serve written notice upon Contractor and its Surety of District's termination of this Contract and/or the Contractor's right to perform the work of the Contract. This notice will contain the reasons for termination. Unless, within three (3) days after the service of the notice, any and all condition(s) shall cease, and any and all violation(s) shall cease, or arrangement satisfactory to District for the correction of the condition(s) and/or violation(s) be made, this Contract and/or the Contractor's right to perform the Work of the Contract shall cease and terminate. Upon termination, Contractor shall not be entitled to receive any further payment until the entire Work is finished.

25.2.2.2 Upon termination, District may immediately serve written notice of tender upon Surety whereby Surety shall have the right to take over and perform this Contract only if Surety:

25.2.2.2.1 Within three (3) days after service upon it of the notice of tender, gives District written notice of Surety's intention to take over and perform this Contract; and

25.2.2.2.2 Commences performance of this Contract within three (3) days from date of serving of its notice to District.

25.2.2.3 Surety shall not utilize Contractor in completing the Project if the District notifies Surety of the District's objection to Contractor's further participation in the completion of the Project. Surety expressly agrees that any contractor which Surety proposes to fulfill Surety's obligations is subject to District's approval. District's approval shall not be unreasonably withheld, conditioned or delayed.

25.2.2.4 If Surety fails to notify District or begin performance as indicated herein, District may take over the Work and execute the Work to completion by any method it may deem advisable at the expense of Contractor and/or its Surety. Contractor and/or its Surety shall be liable to District for any excess cost or other damages the District incurs thereby. Time is of the essence in this Contract. If the District takes over the Work as herein provided, District may, without liability for so doing, take possession of and utilize in completing the Work such materials, appliances, plan, and other property belonging to Contractor as may be on the Site of the Work, in bonded storage, or previously paid for.

25.3 Termination of Contractor for Convenience

25.3.1 District in its sole discretion may terminate the Contract in whole or in part upon three (3) days' written notice to the Contractor.

25.3.2 Upon notice, Contractor shall:

25.3.2.1 Cease operations as directed by the District in the notice;

25.3.2.2 Take necessary actions for the protection and preservation of the Work as soon as possible; and

25.3.2.3 Terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

25.3.3 Within 30 days of the notice, Contractor submit to the District a payment application for the actual cost for labor, materials, and services performed, including all Contractor's and Subcontractor(s)' mobilization and/or demobilization costs, that is unpaid. Contractor shall have no claims against the District except for the actual cost for labor, materials, and services performed that adequately documented through timesheets, invoices, receipts, or otherwise. District shall pay all undisputed invoice(s) for work performed until the notice of termination.

25.3.4 Under a termination for convenience, the District retains the right to all the options available to the District if there is a termination for cause.

25.4 Effect of Termination

25.4.1 Contractor shall, only if ordered to do so by the District, immediately remove from the Site all or any materials and personal property belonging to Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. The District retains the right, but not the obligation, to keep and use any materials and personal property belonging to Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. The Contractor and its Surety shall be liable upon the Performance Bond for all damages caused to the District by reason of the Contractor's failure to complete the Contract.

25.4.2 In the event that the District shall perform any portion of, or the whole of the Work, pursuant to the provisions of the General Conditions, the District shall not be liable nor account to the Contractor in any way for the time within which, or the manner in which, the Work is performed by the District or for any changes the District may make in the Work or for the money expended by the District in satisfying claims and/or suits and/or other obligations in connection with the Work.

25.4.3 In the event termination for cause is determined to have not been for cause, the termination shall be deemed to have been a termination for convenience effective as of the same date as the purported termination for cause.

25.4.4 In the event that the Contract is terminated for any reason, no allowances or compensation will be granted for the loss of any anticipated profit by the Contractor or any impact or impairment of Contractor's bonding capacity.

25.4.5 If the expense to the District to finish the Work exceeds the unpaid Contract Price, Contractor and Surety shall pay difference to District within twenty-one (21) days of District's request.

25.4.6 The District shall have the right (but shall have no obligation) to assume and/or assign to a general contractor or construction manager or other third party who is qualified and has sufficient resources to complete the Work, the rights of the Contractor under its subcontracts with any or all Subcontractors. In the event of an assumption or assignment by the District, no Subcontractor shall have any claim against the District or third party for Work performed by Subcontractor or other matters arising prior to termination of the Contract. The District or any third party, as the case may be, shall be liable only for obligations to the Subcontractor arising after assumption or assignment. Should the District so elect, the Contractor shall execute and deliver all documents and take all steps, including the legal assignment of its contractual rights, as the District may require, for the purpose of fully vesting

in the District the rights and benefits of its Subcontractor under Subcontracts or other obligations or commitments. All payments due the Contractor hereunder shall be subject to a right of offset by the District for expenses and damages suffered by the District as a result of any default, acts, or omissions of the Contractor. Contractor must include this assignment provision in all of its contracts with its Subcontractors.

25.4.7 The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to District.

25.5 Emergency Termination of Public Contracts Act of 1949

25.5.1 This Contract is subject to termination as provided by sections 4410 and 4411 of the Government Code of the State of California, being a portion of the Emergency Termination of Public Contracts Act of 1949.

25.5.1.1 Section 4410 of the Government Code states:

In the event a national emergency occurs, and public work, being performed by contract, is stopped, directly or indirectly, because of the freezing or diversion of materials, equipment or labor, as the result of an order or a proclamation of the President of the United States, or of an order of any federal authority, and the circumstances or conditions are such that it is impracticable within a reasonable time to proceed with a substantial portion of the work, then the public agency and the contractor may, by written agreement, terminate said contract.

25.5.1.2 Section 4411 of the Government Code states:

Such an agreement shall include the terms and conditions of the termination of the contract and provision for the payment of compensation or money, if any, which either party shall pay to the other or any other person, under the facts and circumstances in the case.

25.5.2 Compensation to the Contractor shall be determined at the sole discretion of District on the basis of the reasonable value of the Work done, including preparatory work. As an exception to the foregoing and at the District's discretion, in the case of any fully completed separate item or portion of the Work for which there is a separate previously submitted unit price or item on the accepted schedule of values, that price shall control. The District, at its sole discretion, may adopt the Contract Price as the reasonable value of the work done or any portion thereof.

25.6 Suspension of Work

25.6.1 District in its sole discretion may suspend, delay or interrupt the Work in whole or in part for such period of time as the District may determine upon three (3) days written notice to the Contractor.

25.6.1.1 An adjustment may be made for changes in the cost of performance of the Work caused by any such suspension, delay or interruption. No adjustment shall be made to the extent:

25.6.1.1.1 That performance is, was or would have been so suspended, delayed or interrupted by another cause for which Contractor is responsible; or

25.6.1.1.2 That an equitable adjustment is made or denied under another provision of the Contract; or

25.6.1.1.3 That the suspension of Work was the direct or indirect result of Contractor's failure to perform any of its obligations hereunder.

25.6.1.2 Any adjustments in cost of performance may have a fixed or percentage fee as provided in the section on Format for Proposed Change Order herein. This amount shall be full compensation for all Contractor's and its Subcontractor(s)' changes in the cost of performance of the Contract caused by any such suspension, delay or interruption.

26. CLAIMS PROCESS

26.1 Obligation to File Claims for Disputed Work

26.1.1 Should Contractor otherwise seek extra time or compensation for any reason whatsoever ("Disputed Work"), then Contractor shall first follow procedures set forth in the Contract Documents including, without limitation, Articles 15, 16 and 17, all of which are conditions precedent to submitting a Claim pursuant to Article 25. A Notice of Delay or Proposed Change Order are less formal procedures that proceed the formal claim and do not constitute a Claim. A Claim also does not include correspondence, RFIs, vouchers, invoices, progress payment applications, or other routine or authorized form of requests for progress payments in compliance with the Contract. If a dispute remains, then Contractor shall give written notice to District that expressly invokes this Article 25 within the time limits set forth herein.

26.1.2 Contractor's sole and exclusive remedy for Disputed Work is to file a written claim setting forth Contractor's position as required herein within the time limits set forth herein.

26.2 Duty to Perform during Claim Process

Contractor and its subcontractors shall continue to perform its Work under the Contract including the disputed work, and shall not cause a delay of the Work during any dispute, claim, negotiation, mediation, or arbitration proceeding, except by written agreement by the District.

26.3 Definition of Claim

26.3.1 Pursuant to Public Contract Code section 9204, the term "Claim" means a separate demand by the Contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:

26.3.1.1 A time extension, including without limitation, for relief of damages or penalties for delay assessed by the District under the Contract;

26.3.1.2 Payment by the District of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or to which Contractor is not otherwise entitled to; or

26.3.1.3 An amount of payment disputed by the District.

26.4 Claims Presentation

26.4.1 Form and Contents of Claim

26.4.1.1 If Contractor intends to submit a Claim for an increase in the Contract Price and/or Contract Time for any reason including, without limitation, the acts of District or its agents, Contractor shall, within thirty (30) days after the event giving rise to the Claim, give notice of the Claim ("Notice of Potential Claim") in writing specifically identifying Contractor is invoking this Article 25 Claims Presentation. The Notice of Potential Claim shall provide Contractor's preliminary request for an adjustment to the Contract Price and/or Contract Time, with a description of the grounds therefore.

26.4.1.2 Within thirty (30) days after serving the written Notice of Potential Claim, Contractor shall provide a Claim including an itemized statement of the details and amounts of its Claim for any increase in the Contract Price of Contract Time as provided below, including a Time Impact Analysis and any and all other documentation substantiating Contractor's claimed damages:

26.4.1.2.1 The issues, events, conditions, circumstances and/or causes giving rise to the dispute, and shall show, in detail, the cause and effect of same;

26.4.1.2.2 Citation to provisions in the Contract Documents, statute sections, and/or case law entitling Contractor to an increase in the Contract Price or Contract Time;

26.4.1.2.3 The pertinent dates and/or durations and actual and/or anticipated effects on the Contract Price, Contract Schedule milestones and/or Contract Time adjustments;

26.4.1.2.4 The Time Impact Analysis of all time delays that shows actual time impact on the critical path; and

26.4.1.2.5 The line-item costs for labor, material, and/or equipment, if applicable, for all cost impacts priced like a change order according to Article 17 and must be updated monthly as to cost and entitlement if a continuing claim.

26.4.1.3 The Claim shall include the following certification by the Contractor:

26.4.1.3.1 The undersigned Contractor certifies under penalty of perjury that the attached dispute is made in good faith; that the supporting data is accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the adjustment for which Contractor believes the District is liable; and that I am duly authorized to certify the dispute on behalf of the Contractor.

26.4.1.3.2 Furthermore, Contractor understands that the value of the attached dispute expressly includes any and all of the Contractor's costs and expenses, direct and indirect, resulting from the Work performed on the Project, additional time required on the Project and/or resulting from delay to the Project including, without limitation, cumulative impacts. Contractor may

not separately recover for overhead or other indirect costs. Any costs, expenses, damages, or time extensions not included are deemed waived.

26.4.2 Contractor shall bear all costs incurred in the preparation and submission of a Claim.

26.4.3 Failure to timely submit a Claim and the requisite supporting documentation shall constitute a waiver of Contractor's claim(s) against the District and Contractor's Claim(s) for compensation or an extension of time shall be deemed waived, released, and discharged as to any entitlement for adjustment to Contract Price and/or Contract Time.

26.5 Claim Resolution pursuant to Public Contract Code section 9204

Contractor may request to waive the claims procedure under Public Contract Code section 9204 and proceed directly to the commencement of a civil action or binding arbitration. If Contractor chooses to proceed, Contractor shall comply with the following steps:

26.5.1 STEP 1:

26.5.1.1 Upon receipt of a Claim by registered or certified mail, return receipt requested, including the documents necessary to substantiate it, the District shall conduct a reasonable review of the Claim and, within a period not to exceed 45 days, shall provide the Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed. Upon receipt of a Claim, the District and Contractor may, by mutual agreement, extend the time period to provide a written statement. If the District needs approval from its governing body to provide the Contractor a written statement identifying the disputed portion and the undisputed portion of the Claim, and the governing body does not meet within the 45 days or within the mutually agreed to extension of time following receipt of Claim sent by registered mail or certified mail, return receipt requested, the District shall have up to three (3) days following the next duly publicly noticed meeting of the governing body after the 45-day period, or extension, expires to provide Contractor a written statement identifying the disputed portion and the undisputed portion.

26.5.1.1.1 Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the District issues its written statement. Amounts not paid in a timely manner as required by this section, section 25.4, shall bear interest at seven percent (7%) per annum.

26.5.1.2 Upon receipt of a Claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable. In this instance, District and Contractor must comply with the sections below regarding Public Contract Code section 20104 et seq. and Government Code Claim Act Claims.

26.5.1.3 If the District fails to issue a written statement, or to otherwise meet the time requirements of this section, this shall result in the Claim being deemed rejected in its entirety. A Claim that is denied by reason of the District's failure to have responded to a 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.

26.5.2 STEP 2:

26.5.2.1 If Contractor disputes the District's written response, or if the District fails to respond to a Claim within the time prescribed, Contractor may 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 mail or certified mail, return receipt requested, the District shall schedule a meet and confer conference within 30 days for settlement of the dispute. Within 10 business days following the conclusion of the meet and confer conference, if the Claim or any portion of the Claim remains in dispute, the District shall provide the Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed.

26.5.2.1.1.1 Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the District issues its written statement. Amounts not paid in a timely manner as required by this section, section 25.4, shall bear interest at seven percent (7%) per annum.

26.5.3 STEP 3:

26.5.3.1 Any disputed portion of the Claim, as identified by Contractor in writing, shall be submitted to nonbinding mediation, with the District and Contractor sharing the associated costs equally. The District and Contractor shall mutually agree to a mediator within 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. If mediation is unsuccessful, the parts of the Claim remaining in dispute shall be subject to applicable procedures outside this section.

26.5.3.1.1 For purposes of this section, 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.

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

26.5.4 STEP 4:

26.5.4.1 If mediation under this section does not resolve the parties' dispute, the District may, but does not require arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program.

26.6 Subcontractor Pass-Through Claims

26.6.1 If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against a District because privity of contract does not exist, the contractor may present to the District a Claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on his or her 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 subcontractor requesting that the Claim be presented to the District shall furnish reasonable documentation to support the Claim.

26.6.2 Within 45 days of receipt of this written request from a subcontractor, Contractor shall notify the subcontractor in writing as to whether the Contractor presented the Claim to the District and, if Contractor did not present the Claim, provide the subcontractor with a statement of the reasons for not having done so.

26.6.3 The Contractor shall bind all its Subcontractors to the provisions of this section and will hold the District harmless against Claims by Subcontractors.

26.7 Government Code Claim Act Claim

26.7.1 If a claim, or any portion thereof, remains in dispute upon satisfaction of all applicable Claim Resolution requirements the Contractor shall comply with all claims presentation requirements as provided in Chapter 1 (commencing with section 900) and Chapter 2 (commencing with section 910) of Part 3 of Division 3.6 of Title 1 of Government Code as a condition precedent to the Contractor's right to bring a civil action against the District.

26.7.2 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 of the claims asserted.

26.7.3 For purposes of those provisions, the running of the time within which a claim pursuant to Public Contract Code section 20104.2 only must be presented to the District shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

26.8 Claim Resolution pursuant to Public Contract Code section 20104 et seq.

26.8.1 In the event of a disagreement between the parties as to performance of the Work, the interpretation of this Contract, or payment or nonpayment for Work performed or not performed, the parties shall attempt to resolve all claims of three hundred seventy-five thousand dollars ($375,000) or less which arise between Contractor and District by those procedures set forth in Public Contract Code section 20104, et seq., to the extent applicable.

26.8.1.1 Contractor shall file with the District any written Claim, including the documents necessary to substantiate it, upon the application for final payment.

26.8.1.2 For claims of less than fifty thousand dollars ($50,000), the District shall respond in writing within forty-five (45) days of receipt of the Claim or may request in writing within thirty (30) days of receipt of the Claim any additional documentation supporting the Claim or relating to defenses or claims the District may have against the Contractor.

26.8.1.2.1 If additional information is required, it shall be requested and provided by mutual agreement of the parties.

26.8.1.2.2 District's written response to the documented Claim shall be submitted to the Contractor within fifteen (15) days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor to produce the additional information, whichever is greater.

26.8.1.3 For claims of over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), the District shall respond in writing to all written Claims within sixty (60) days of receipt of the claim, or may request, in writing, within thirty (30) days of receipt of the Claim any additional documentation supporting the Claim or relating to defenses or claims the District may have against the Contractor.

26.8.1.3.1 If additional information is required, it shall be requested and provided upon mutual agreement of the District and the Contractor.

26.8.1.3.2 The District's written response to the Claim, as further documented, shall be submitted to the Contractor within thirty (30) days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor to produce the additional information or requested documentation, whichever is greater.

26.8.1.4 If Contractor disputes the District's written response, or the District fails to respond within the time prescribed, Contractor may so notify the District, in writing, either within fifteen (15) days of receipt of the District's response or within fifteen (15) days of the District's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the District shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

26.8.1.5 Following the meet and confer conference, if the Claim or any portion of it remains in dispute, the Contractor may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions the running of the time within which a claim must be filed shall be tolled from the time the Contractor submits its written Claim until the time the Claim is denied, including any period of time utilized by the meet and confer process.

26.8.1.6 For any civil action filed to resolve claims filed pursuant to this section, within sixty (60) days, but no earlier than thirty (30) days, following the filing of responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within fifteen (15) days by both parties of a

disinterested third person as mediator, shall be commenced within thirty (30) days of the submittal, and shall be concluded within fifteen (15) days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

26.8.1.7 If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of the Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986, (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

26.8.1.8 The District shall not fail to pay money as to any portion of a Claim which is undisputed except as otherwise provided in the Contract Documents. In any suit filed pursuant to this section, the District shall pay interest due at the legal rate on any arbitration award or judgment. Interest shall begin to accrue on the date the suit is filed in a court of law.

26.8.2 Contractor shall bind its Subcontractors to the provisions of this Section and will hold the District harmless against disputes by Subcontractors.

26.9 Claim Procedure Compliance

26.9.1 Failure to submit and administer claims as required in Article 25 shall waive Contractor's right to claim on any specific issues not included in a timely submitted claim. Claim(s) not raised in a timely protest and timely claim submitted under this Article 25 may not be asserted in any subsequent litigation, Government Code Claim, or legal action.

26.9.2 District shall not be deemed to waive any provision under this Article 25, if at District's sole discretion, a claim is administered in a manner not in accord with this Article 25. Waivers or modifications of this Article 25 may only be made by a signed change order approved as to form by legal counsel for both District and Contractor; oral or implied modifications shall be ineffective.

26.10 Claim Resolution Non-Applicability

26.10.1 The procedures for dispute and claim resolutions set forth in this Article shall not apply to the following:

26.10.1.1 Personal injury, wrongful death or property damage claims;

26.10.1.2 Latent defect or breach of warranty or guarantee to repair;

26.10.1.3 Stop payment notices;

26.10.1.4 District's rights set forth in the Article on Suspension and Termination;

26.10.1.5 Disputes arising out of labor compliance enforcement by the Department of Industrial Relations; or

26.10.1.6 District rights and obligations as a public entity set forth in applicable statutes; provided, however, that penalties imposed against a public entity by statutes, including, but not limited to, Public Contract Code sections 20104.50 and 7107, shall be subject to the Claim Resolution requirements provided in this Article.

26.11 Attorney's Fees

26.11.1 Should litigation be necessary to enforce any terms or provisions of this Agreement, then each party shall bear its own litigation and collection expenses, witness fees, court costs, and attorney's fees.

27. STATE LABOR, WAGE & HOUR, APPRENTICE, AND RELATED PROVISIONS

27.1 Labor Compliance and Enforcement

Since this Project is subject to labor compliance and enforcement by the Department of Industrial Relations ("DIR"), Contractor specifically acknowledges and understands that it shall perform the Work of this Agreement while complying with all the applicable provisions of Division 2, Part 7, Chapter 1, of the Labor Code and Title 8 of the California Code of Regulations, including, without limitation, the requirement that the Contractor and all Subcontractors shall timely furnish complete and accurate electronic certified payroll records directly to the DIR. The District may not issue payment if this requirement is not met.

27.2 Wage Rates, Travel, and Subsistence

27.2.1 Pursuant to the provisions of Article 2 (commencing at section 1770), Chapter 1, Part 7, Division 2, of the Labor Code, the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this public work is to be performed for each craft, classification, or type of worker needed to execute this Contract are on file at the District's principal office and copies will be made available to any interested party on request. Contractor shall obtain and post a copy of these wage rates at the job site.

27.2.2 Holiday and overtime work, when permitted by law, shall be paid for at the general prevailing rate of per diem wages for holiday and overtime work on file with the Director of the Department of Industrial Relations, unless otherwise specified. The holidays upon which those rates shall be paid need not be specified by the District, but shall be all holidays recognized in the applicable collective bargaining agreement. 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.

27.2.3 Contractor shall pay and shall cause to be paid each worker engaged in Work on the Project the general prevailing rate of per diem wages determined by the Director of the Department of Industrial Relations, regardless of any contractual relationship which may be alleged to exist between Contractor or any Subcontractor and such workers.

27.2.4 If during the period this bid is required to remain open, the Director of the Department of Industrial Relations determines that there has been a change in any prevailing rate of per diem wages in the locality in which the Work under the Contract is to be performed, such change shall not alter the wage rates in the Notice to Bidders or the Contract subsequently awarded.

27.2.5 Pursuant to Labor Code section 1775, Contractor shall, as a penalty to District, forfeit the statutory amount (believed by the District to be currently up to two hundred dollars ($200) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates, determined by the District and/or the Director, for the work or craft in which that worker is employed for any public work done under Contract by Contractor or by any Subcontractor under it. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by Contractor.

27.2.6 Any worker employed to perform Work on the Project, which Work is not covered by any classification listed in the general prevailing wage rate of per diem wages determined by the Director, shall be paid not less than the minimum rate of wages specified therein for the classification which most nearly corresponds to Work to be performed by him, and such minimum wage rate shall be retroactive to time of initial employment of such person in such classification.

27.2.7 Pursuant to Labor Code section 1773.1, per diem wages are deemed to include employer payments for health and welfare, pension, vacation, travel time, subsistence pay, and apprenticeship or other training programs authorized by Labor Code section 3093, and similar purposes.

27.2.8 Contractor shall post at appropriate conspicuous points on the Site of Project, a schedule showing all determined minimum wage rates and all authorized deductions, if any, from unpaid wages actually earned. In addition, Contractor shall post a sign-in log for all workers and visitors to the Site, a list of all subcontractors of any tier on the Site, and the required Equal Employment Opportunity poster(s).

27.3 Hours of Work

27.3.1 As provided in article 3 (commencing at section 1810), chapter 1, part 7, division 2, of the Labor Code, eight (8) hours of labor shall constitute a legal day's work. The time of service of any worker employed at any time by Contractor or by any Subcontractor on any subcontract under this Contract upon the Work or upon any part of the Work contemplated by this Contract shall be limited and restricted by Contractor to eight (8) hours per day, and forty (40) hours during any one week, except as hereinafter provided. Notwithstanding the provisions hereinabove set forth, Work performed by employees of Contractor in excess of eight (8) hours per day and forty (40) hours during any one week, shall be permitted upon this public work upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half times the basic rate of pay.

27.3.2 Contractor shall keep and shall cause each Subcontractor to keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by Contractor in connection with the Work or any part of the Work contemplated by this Contract. The record shall be kept open at all reasonable hours to the inspection of District and to the Division of Labor Standards Enforcement of the DIR.

27.3.3 Pursuant to Labor Code section 1813, Contractor shall as a penalty to the District forfeit the statutory amount (believed by the District to be currently twenty-five dollars ($25)) for each worker employed in the execution of this Contract by Contractor or by any Subcontractor for each calendar day during which such worker

is required or permitted to work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of the provisions of article 3 (commencing at section 1810), chapter 1, part 7, division 2, of the Labor Code.

27.3.4 Any Work necessary to be performed after regular working hours, or on Sundays or other holidays shall be performed without additional expense to the District.

27.4 Payroll Records

27.4.1 Contractor shall upload, and shall cause each Subcontractor performing any portion of the Work under this Contract to upload, an accurate and complete certified payroll record ("CPR") electronically using DIR's eCPR System by uploading the CPRs by electronic XML file or entering each record manually using the DIR's iform (or current form) online on no less than every 30 days while Work is being performed and within 30 days after the final day of Work performed on the Project and within ten (10) days of any request by the District or Labor Commissioner at http://www.dir.ca.gov/Public-Works/Certified-Payroll-Reporting.html or current application and URL, showing the name, address, social security number, work classification, 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 each Subcontractor in connection with the Work.

27.4.1.1 The CPRs enumerated hereunder shall be filed directly with the DIR on a weekly basis or to the requesting party, whether the District or DIR, within ten (10) days after receipt of each written request. The CPRs from the Contractor and each Subcontractor for each week shall be provided on or before Wednesday of the week following the week covered by the CPRs. District may not make any payment to Contractor until:

27.4.1.1.1 Contractor and/or its Subcontractor(s) provide CPRs acceptable to the DIR; and

27.4.1.1.2 Any delay in Contractor and/or its Subcontractor(s) providing CPRs to the DIR in a timely manner may directly delay Contractor's payment.

27.4.2 All CPRs shall be available for inspection at all reasonable hours at the principal office of Contractor on the following basis:

27.4.2.1 A certified copy of an employee's CPR shall be made available for inspection or furnished to the employee or his/her authorized representative on request.

27.4.2.2 CPRs shall be made available for inspection or furnished upon request to a representative of District, Division of Labor Standards Enforcement, Division of Apprenticeship Standards, and/or the DIR.

27.4.2.3 CPRs shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through the District, Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested CPRs have not been provided pursuant to the provisions herein, the requesting party shall, prior to being

provided the records, reimburse the costs of preparation by Contractor, Subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of Contractor.

27.4.3 Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by District, Division of Apprenticeship Standards, or Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of Contractor awarded Contract or performing Contract shall not be marked or obliterated.

27.4.4 Contractor shall inform District of the location of the records enumerated hereunder, including the street address, city, and county, and shall, within five (5) working days, provide a notice of change of location and address.

27.4.5 In the event of noncompliance with the requirements of this section, Contractor shall have ten (10) days in which to comply subsequent to receipt of written notice specifying in what respects Contractor must comply with this section. Should noncompliance still be evident after the ten (10) day period, Contractor shall, as a penalty to District, forfeit up to one hundred dollars ($100) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Labor Commissioner, these penalties shall be withheld from progress payments then due.

27.4.6 [RESERVED]

27.5 [RESERVED]

27.6 Apprentices

27.6.1 Contractor acknowledges and agrees that, if this Contract involves a dollar amount greater than, or a number of working days greater than that specified in Labor Code section 1777.5, then this Contract is governed by the provisions of Labor Code Section 1777.5. It shall be the responsibility of Contractor to ensure compliance with this Article and with Labor Code section 1777.5 for all apprenticeship occupations.

27.6.2 Apprentices of any crafts or trades may be employed and, when required by Labor Code section 1777.5, shall be employed provided they are properly registered in full compliance with the provisions of the Labor Code.

27.6.3 Every such apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he/she is employed, and shall be employed only at the work of the craft or trade to which she/he is registered.

27.6.4 Only apprentices, as defined in section 3077 of the Labor Code, who are in training under apprenticeship standards and written apprentice agreements under chapter 4 (commencing at section 3070), division 3, of the Labor Code, are eligible to be employed. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which he/she is training.

27.6.5 Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractors employing workers in any apprenticeable craft or trade in performing any Work under this Contract shall apply to the applicable joint apprenticeship committee for a certificate approving the Contractor or Subcontractor under the applicable apprenticeship standards and fixing the ratio of apprentices to journeymen employed in performing the Work.

27.6.6 Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractor may be required to make contributions to the apprenticeship program.

27.6.7 If Contractor or Subcontractor willfully fails to comply with Labor Code section 1777.5, then, upon a determination of noncompliance by the Administrator of Apprenticeship, it shall:

27.6.7.1 Be denied the right to bid on any subsequent project for one (1) year from the date of such determination;

27.6.7.2 Forfeit as a penalty to District the full amount as stated in Labor Code section 1777.7. Interpretation and enforcement of these provisions shall be in accordance with the rules and procedures of the California Apprenticeship Council and under the authority of the Chief of the Division of Apprenticeship Standards.

27.6.8 Contractor and all Subcontractors shall comply with Labor Code section 1777.6, which section forbids certain discriminatory practices in the employment of apprentices.

27.6.9 Contractor shall become fully acquainted with the law regarding apprentices prior to commencement of the Work. Special attention is directed to sections 1777.5, 1777.6, and 1777.7 of the Labor Code, and title 8, California Code of Regulations, section 200 et seq. Questions may be directed to the State Division of Apprenticeship Standards, 455 Golden Gate Avenue, 9th floor, San Francisco, California 94102.

27.7 Non-Discrimination

27.7.1 Contractor herein agrees to comply with the provisions of the California Fair Employment and Housing Act as set forth in part 2.8 of division 3 of the California Government Code, commencing at section 12900; the Federal Civil Rights Act of 1964, as set forth in Public Law 88-352, and all amendments thereto; Executive Order 11246; and all administrative rules and regulations found to be applicable to Contractor and Subcontractor.

27.7.2 Special requirements for Federally Assisted Construction Contracts: During the performance of this Contract, Contractor agrees to incorporate in all subcontracts the provisions set forth in Chapter 60-1.4(b) of Title 41 published in Volume 33 No. 104 of the Federal Register dated May 28, 1968.

27.8 Labor First Aid

Contractor shall maintain emergency first aid treatment for Contractor's workers on the Project which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.) and the California Occupational Safety and Health Act of 1973 (Lab. Code, § 6300 et seq.; 8 Cal. Code of Regs., § 330 et seq.).

28. [RESERVED]

29. MISCELLANEOUS

29.1 Assignment of Antitrust Actions

29.1.1 Section 7103.5(b) of the Public Contract Code states:

In entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commending with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, which assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

29.1.2 Section 4552 of the Government Code states:

In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

29.1.3 Section 4553 of the Government Code states:

If an awarding body or public purchasing body receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under this chapter, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the public body any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the public body as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

29.1.4 Section 4554 of the Government Code states:

Upon demand in writing by the assignor, the assignee shall, within one year from such demand, reassign the cause of action assigned under this part if the assignor has been or may have been injured by the violation of law for which the cause of action arose and (a) the assignee has not been injured thereby, or (b) the assignee declines to file a court action for the cause of action.

29.1.5 Under this Article, "public purchasing body" is District and "bidder" is Contractor.

29.2 Excise Taxes

If, under Federal Excise Tax Law, any transaction hereunder constitutes a sale on which a Federal Excise Tax is imposed and the sale is exempt from such Federal Excise Tax because it is a sale to a State or Local Government for its exclusive use, District, upon request, will execute documents necessary to show (1) that District is a political subdivision of the State for the purposes of such exemption, and (2) that the sale is for the exclusive use of District. No Federal Excise Tax for such materials shall be included in any Contract Price.

29.3 Taxes

Contract Price is to include any and all applicable sales taxes or other taxes that may be due in accordance with section 7051 et seq. of the Revenue and Taxation Code, Regulation 1521 of the State Board of Equalization or any other tax code that may be applicable.

29.4 Shipments

Contractor is responsible for any or all damage or loss to shipments until delivered and accepted on Site, as indicated in the Contract Documents. There must be no charge for containers, packing, unpacking, drayage, or insurance. The total Contract Price shall be all inclusive (including sales tax) and no additional costs of any type will be considered.

29.5 Compliance with Government Reporting Requirements

If this Contract is subject to federal or other governmental reporting requirements because of federal or other governmental financing in whole or in part for the Project of which it is part, or for any other reason, Contactor shall comply with those reporting requirements at the request of the District at no additional cost.

END OF DOCUMENT

DOCUMENT 00 73 13

SPECIAL CONDITIONS

DOCUMENT 00 73 13

SPECIAL CONDITIONS

1. Mitigation Measures

Contractor shall comply with all applicable mitigation measures, if any, adopted by any public agency with respect to this Project pursuant to the California Environmental Quality Act. (Public Resources Code section 21000 *et seq*.)

2. Modernization Projects

A. **Access.** Access to the school buildings and entry to buildings, classrooms, restrooms, mechanical rooms, electrical rooms, or other rooms, for construction purposes, must be coordinated with District and onsite District personnel before Work is to start. Unless agreed to otherwise in writing, only a school custodian will be allowed to unlock and lock doors in existing building(s). The custodian will be available only while school is in session. If a custodian is required to arrive before 7:00 a.m. or leave after 3:30 p.m. to accommodate Contractor's Work, the overtime wages for the custodian will be paid by the Contractor, unless at the discretion of the District, other arrangements are made in advance.

B. **Keys**. Upon request, the District may, at its own discretion, provide keys to the school site for the convenience of the Contractor. The Contractor agrees to pay all expenses to re-key the entire school site and all other affected District buildings if the keys are lost or stolen, or if any unauthorized party obtains a copy of the key or access to the school.

C. **Maintaining Services.** The Contractor is advised that Work is to be performed in spaces regularly scheduled for instruction. Interruption and/or periods of shutdown of public access, electrical service, water service, lighting, or other utilities shall be only as arranged in advance with the District. Contractor shall provide temporary services to all facilities interrupted by Contractor's Work.

D. **Maintaining Utilities**. The Contractor shall maintain in operation during duration of Contract, drainage lines, storm drains, sewers, water, gas, electrical, steam, and other utility service lines within working area.

E. **Confidentiality.** Contractor shall maintain the confidentiality of all information, documents, programs, procedures and all other items that Contractor encounters while performing the Work. This requirement shall be ongoing and shall survive the expiration or termination of this Contract and specifically includes, without limitation, all student, parent, and employee disciplinary information and health information.

F. **Work during Instructional Time.** By submitting its bid, Contractor affirms that Work may be performed during ongoing instruction in existing facilities. If so, Contractor agrees to cooperate to the best of its ability to minimize any

disruption to school operations and any use of school facilities by the public up to, and including, rescheduling specific work activities, at no additional cost to District.

G. **No Work during Student Testing.** Contractor shall, at no additional cost to the District and at the District's request, coordinate its Work to not disturb District students including, without limitation, not performing any Work when students at the Site are taking State or Federally-required tests.

6. Badge Policy for Contractors

All Contractors doing work for the District will provide their workers with identification badges. These badges will be worn by all members of the Contractor's staff who are working in a District facility.

A. Badges must be filled out in full and contain the following information:

(1) Name of Contractor

(2) Name of Employee

(3) Contractor's address and phone number

B. Badges are to be worn when the Contractor or his/her employees are on site and must be visible at all times. Contractors must inform their employees that they are required to allow District employees, the Architect, the Construction Manager, the Program Manager, or the Project Inspector to review the information on the badges upon request.

C. Continued failure to display identification badges as required by this policy may result in the individual being removed from the Project or assessment of fines against the Contractor.

7. As-Builts and Record Drawings

A. When called for by Division 1, Contractor shall submit As-Built Drawings pursuant to the Contract Documents consisting of one set of computer-aided design and drafting ("CADD") files in the following format PDF.

B. Contractor shall submit Record Drawings pursuant to the Contract Documents consisting of one set of computer-aided design and drafting ("CADD") files in the following format PDF.

8. Disabled Veteran Business Enterprises

This Project uses or may plan to use funds allocated pursuant to the State of California School Facility Program ("Program") for the construction and/or modernization of school buildings. Therefore, Section 17076.11 of the Education Code requires the District to have a participation goal for disabled veteran business enterprises ("DVBE") of at least three percent (3%), per year, of the overall dollar amount expended each year by the District on projects that receive state funding. The Contractor must submit the Disabled Veteran Business Enterprise Participation Certification to the District with its executed Agreement, identifying the steps Contractor took to solicit DVBE participation in conjunction with this Contract.

9. Construction Manager

The District will use a Construction Manager on the Project that is the subject of this Contract. **Premier Management Group** is the Construction Manager for this Project.

10. Program Manager

Brendin Swanson is the Program Manager designated for the Project that is the subject of this Contract.

11. COVID-19 Safety Requirements

Contractor shall, at its cost, timely comply with all applicable federal, State, and local requirements relating to COVID-19 or other public health emergency/epidemic/pandemic. Further, except to the extent the Order provides otherwise, Contractor and Contractor's personnel, subcontractors and suppliers shall continue to comply with all applicable terms in the California Department of Public Health's State Public Health Officer Orders.

12. COVID-19 Vaccination/Testing Requirements

Vaccination Requirements

Contractor shall fill out, sign, date and submit to District the COVID-19 Vaccination/Testing Certification Form, attached hereto as **Attachment "A."**

According to the August 11, 2021, California Department of Public Health ("CDPH") State Public Health Officer Order ("Order"), a person is "fully vaccinated" for COVID-19 if two weeks or more have passed since they have received the second dose in a 2-dose series (Pfizer-BioNTech or Moderna or vaccine authorized by the World Health Organization), or two weeks or more have passed since they received a single-dose vaccine (Johnson and Johnson[J&J]/Janssen).

Pursuant to the CDPH Guidance for Vaccine Records Guidelines & Standards, Contractor shall only accept the following as proof of vaccination:

(a) COVID-19 Vaccination Record Card (issued by the Department of Health and Human Services Centers for Disease Control & Prevention or WHO Yellow Card which includes name of person vaccinated, type of vaccine provided and date last dose administered);

(b) a photo of a Vaccination Record Card as a separate document;

(c) a photo of a Vaccination Record Card stored on a phone or electronic device;

(d) documentation of COVID-19 vaccination from a health care provider;

(e) digital record that includes a QR code that when scanned by a SMART Health Card reader displays to the reader name, date of birth, vaccine dates and vaccine type; or

(f) documentation of vaccination from other contracted employers who follow these vaccination records guidelines and standards.

In the absence of knowledge to the contrary, Contractor may accept the documentation presented in (a) through (f) above as valid.

Contractor shall have a plan in place for tracking verified Contractor personnel vaccination status. Records of vaccination verification must be made available, upon request, to the local health jurisdiction for purposes of case investigation.

Contractor personnel, including any and all tiers of subcontractor, supplier, and any other personnel entering the Project site, who are not fully vaccinated, or for whom vaccine status is unknown or documentation is not provided, must be considered unvaccinated.

Weekly Testing Requirements

Contractor shall ensure that Contractor personnel, including any and all tiers of subcontractor, supplier, and any other worker entering the Project site, who are unvaccinated or who are not fully vaccinated are required to undergo diagnostic screening testing, as specified below:

(a) Contractor personnel may be tested with either antigen or molecular tests to satisfy this requirement, but unvaccinated or incompletely vaccinated workers must be tested at least once weekly with either PCR testing or antigen testing. Any PCR (molecular) or antigen test used must either have Emergency Use Authorization by the U.S. Food and Drug Administration or be operating per the Laboratory Developed Test requirements by the U.S. Centers for Medicare and Medicaid Services.

(b) Unvaccinated or not fully vaccinated Contractor personnel must also observe all other infection control requirements, and are not exempted from the testing requirement even if they have a medical contraindication to vaccination, since they are still potentially able to spread the illness. Previous history of COVID-19 from which the individual recovered more than 90 days earlier, or a previous positive antibody test for COVID-19, do not waive this requirement for testing.

Contractor shall have a plan in place for tracking test results and conducting workplace contact tracing, and must report results to local public health departments, if applicable.

[ATTACHMENT "A" ON NEXT PAGE]

ATTACHMENT "A"
COVID-19 VACCINATION/TESTING CERTIFICATION

Contractor: _____

The California Department of Public Health ("CDPH") requires, pursuant to its August 11, 2021, Order ("Order"), that all public and private schools serving students in transitional kindergarten through grade twelve, unless exempt, are required to verify the vaccine status of all K-12 school workers, effective October 15, 2021. Further, pursuant to the Order, all such schools are required to verify that all workers are either fully vaccinated or undergo weekly diagnostic testing.

In light of these CDPH requirements, Contractor certifies that the following entity:

_____

has verified that the Contractor personnel providing services at District's Project site(s):

☐ Have all been fully vaccinated in accordance with the CDPH Order.

☐ Have not all been fully vaccinated, but those who are unvaccinated or not fully vaccinated undergo weekly diagnostic testing in accordance with the CDPH Order.

☐ Have not been fully vaccinated and do not undergo weekly diagnostic testing in accordance with the CDPH Order.

Contractor understands that the District's Project site will need to comply with the CDPH Order's COVID-19 requirements for fully vaccinated personnel or unvaccinated personnel. Personnel who are not fully vaccinated or decline to state their vaccination status will be treated as unvaccinated, and Contractor will comply with the CDPH Order, and all applicable state and local laws for vaccinated and unvaccinated personnel.

CERTIFICATION

I, _____, certify that I am Contractor's_____ and that I have made a diligent effort to ascertain the facts with regard to the representations made herein.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DOCUMENT 00 73 56

HAZARDOUS MATERIALS
PROCEDURES & REQUIREMENTS

55. Summary

This document includes information applicable to hazardous materials and hazardous waste abatement.

56. Notice of Hazardous Waste or Materials

a. Contractor shall give notice in writing to the District, the Construction Manager, and the Architect promptly, before any of the following materials are disturbed, and in no event later than twenty-four (24) hours after first observance, of any:

(1) Material that Contractor believes may be a material that is hazardous waste or hazardous material, as defined in section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law;

(2) Other material that may present a substantial danger to persons or property exposed thereto in connection with Work at the site.

b. Contractor's written notice shall indicate whether the hazardous waste or material was shown or indicated in the Contract Documents to be within the scope of Work, and whether the materials were brought to the site by Contractor, its Subcontractors, suppliers, or anyone else for whom Contractor is responsible. As used in this section the term "hazardous materials" shall include, without limitation, asbestos, lead, Polychlorinated biphenyl (PCB), petroleum and related hydrocarbons, and radioactive material.

c. In response to Contractor's written notice, the District shall investigate the identified conditions.

d. If the District determines that conditions do not involve hazardous materials or that no change in terms of Contract is justified, the District shall so notify Contractor in writing, stating reasons. If the District and Contractor cannot agree on whether conditions justify an adjustment in Contract Price or Contract Time, or on the extent of any adjustment, Contractor shall proceed with the Work as directed by the District.

e. If after receipt of notice from the District, Contractor does not agree to resume Work based on a reasonable belief it is unsafe, or does not agree to resume Work under special conditions, then District may order such portion of Work that is in connection with such hazardous condition or such affected area to be deleted from the Work, or performed by others, or District may invoke its rights to terminate the Contract in whole or in part. District will determine entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Time as a result of deleting such portion of Work, or performing the Work by others.

f. If Contractor stops Work in connection with any hazardous condition and in any area affected thereby, Contractor shall immediately redeploy its workers, equipment, and materials, as necessary, to other portions of the Work to minimize delay and disruption.

57. Additional Warranties and Representations

a. Contractor represents and warrants that it, its employees, and its subcontractors and their employees, shall at all times have the required levels of familiarity with the Site and the Work, training, and ability to comply fully with all applicable laws and contractual requirements for safe and expeditious performance of the Work, including whatever training is or may be required regarding the activities to be performed (including, but not limited to, all training required to address adequately the actual or potential dangers of Contract performance).

b. Contractor represents and warrants that it, its employees, and its subcontractors and their employees, shall at all times have and maintain in good standing any and all certifications and licenses required by applicable federal, state, and other governmental and quasi-governmental requirements applicable to the Work.

c. Contractor represents and warrants that it has studied carefully all requirements of the Specifications regarding procedures for demolition, hazardous waste abatement, or safety practices, specified in the Contract, and prior to submitting its bid, has either (a) verified to its satisfaction that the specified procedures are adequate and sufficient to achieve the results intended by the Contract Documents, or (b) by way of approved "or equal" request or request for clarification and written Addenda, secured changes to the specified procedures sufficient to achieve the results intended by the Contract Documents. Contractor accepts the risk that any specified procedure will result in a completed Project in full compliance with the Contract Documents.

58. Monitoring and Testing

a. District reserves the right, in its sole discretion, to conduct air monitoring, earth monitoring, Work monitoring, and any other tests (in addition to testing required under the agreement or applicable law), to monitor Contract requirements of safe and statutorily compliant work methods and (where applicable) safe re-entry level air standards under state and federal law upon completion of the job, and compliance of the work with periodic and final inspection by public and quasi-public entities having jurisdiction.

b. Contractor acknowledges that District has the right to perform, or cause to be performed, various activities and tests including, but not limited to, pre-abatement, during abatement, and post-abatement air monitoring, that District shall have no obligation to perform said activities and tests, and that a portion of said activities and tests may take place prior to the completion of the Work by Contractor. In the event District elects to perform these activities and tests, Contractor shall afford District ample access to the Site and all areas of the Work as may be necessary for the performance of these activities and tests. Contractor will include the potential impact of these

activities or tests by District in the Contract Price and the Scheduled Completion Date.

c. Notwithstanding District's rights granted by this paragraph, Contractor may retain its own industrial hygiene consultant at Contractor's own expense and may collect samples and may perform tests including, but not limited to, pre-abatement, during abatement, and post-abatement personal air monitoring, and District reserves the right to request documentation of all such activities and tests performed by Contractor relating to the Work and Contractor shall immediately provide that documentation upon request.

59. Compliance with Laws

a. Contractor shall perform safe, expeditious, and orderly work in accordance with the best practices and the highest standards in the hazardous waste abatement, removal, and disposal industry, the applicable law, and the Contract Documents, including, but not limited to, all responsibilities relating to the preparation and return of waste shipment records, all requirements of the law, delivering of all requisite notices, and obtaining all necessary governmental and quasi-governmental approvals.

b. Contractor represents that it is familiar with and shall comply with all laws applicable to the Work or completed Work including, but not limited to, all federal, state, and local laws, statutes, standards, rules, regulations, and ordinances applicable to the Work relating to:

(1) The protection of the public health, welfare and environment;

(2) Storage, handling, or use of asbestos, PCB, lead, petroleum based products, radioactive material, or other hazardous materials;

(3) The generation, processing, treatment, storage, transport, disposal, destruction, or other management of asbestos, PCB, lead, petroleum, radioactive material, or hazardous waste materials or other waste materials of any kind; and

(4) The protection of environmentally sensitive areas such as wetlands and coastal areas.

60. Disposal

a. Contractor has the sole responsibility for determining current waste storage, handling, transportation, and disposal regulations for the job Site and for each waste disposal facility. Contractor must comply fully at its sole cost and expense with these regulations and any applicable law. District may, but is not obligated to, require submittals with this information for it to review consistent with the Contract Documents.

b. Contractor shall develop and implement a system acceptable to District to track hazardous waste from the Site to disposal, including appropriate "Hazardous Waste Manifests" on the EPA form, so that District may track the volume of waste it put in each landfill and receive from each landfill a certificate of receipt.

c. Contractor shall provide District with the name and address of each waste disposal facility prior to any disposal, and District shall have the express right to reject any proposed disposal facility. Contractor shall not use any disposal facility to which District has objected. Contractor shall document actual disposal or destruction of waste at a designated facility by completing a disposal certificate or certificate of destruction forwarding the original to the District.

61. Permits

a. Before performing any of the Work, and at such other times as may be required by applicable law, Contractor shall deliver all requisite notices and obtain the approval of all governmental and quasi-governmental authorities having jurisdiction over the Work. Contractor shall submit evidence satisfactory to District that it and any disposal facility:

(1) have obtained all required permits, approvals, and the like in a timely manner both prior to commencement of the Work and thereafter as and when required by applicable law; and

(2) are in compliance with all such permits, approvals and the regulations.

For example, before commencing any work in connection with the Work involving asbestos-containing materials, or PCBs, or other hazardous materials subject to regulation, Contractor agrees to provide the required notice of intent to renovate or demolish to the appropriate state or federal agency having jurisdiction, by certified mail, return receipt requested, or by some other method of transmittal for which a return receipt is obtained, and to send a copy of that notice to District. Contractor shall not conduct any Work involving asbestos-containing materials or PCBs unless Contractor has first confirmed that the appropriate agency having jurisdiction is in receipt of the required notification. All permits, licenses, and bonds that are required by governmental or quasi-governmental authorities, and all fees, deposits, tap fees, offsite easements, and asbestos and PCB disposal facilities expenses necessary for the prosecution of the Work, shall be procured and paid for by Contractor. Contractor shall give all notices and comply with the all applicable laws bearing on the conduct of the Work as drawn and specified. If Contractor observes or reasonably should have observed that Plans and Specifications and other Contract Documents are at variance therewith, it shall be responsible for promptly notifying District in writing of such fact. If Contractor performs any Work contrary to applicable laws, it shall bear all costs arising therefrom.

b. In the case of any permits or notices held in District's name or of necessity to be made in District's name, District shall cooperate with Contractor in securing the permit or giving the notice, but the Contractor shall prepare for District review and execution upon approval, all necessary applications, notices, and other materials.

62. Indemnification

To the fullest extent permitted by law, the indemnities and limitations of liability expressed throughout the Contract Documents apply with equal force and effect to any claims or liabilities imposed or existing by virtue of the removal, abatement, and disposal of hazardous waste. This includes, but is not limited to, liabilities connected to the selection and use of a waste disposal facility, a waste transporter, personal injury, property damage, loss of use of property, damage to the environment or natural resources, or "disposal" and "release" of materials associated with the Work (as defined in 42 U.S.C. § 960l *et seq*.).

63. Termination

District shall have an absolute right to terminate for default immediately without notice and without an opportunity to cure should Contractor knowingly or recklessly commit a material breach of the terms of the Contract Documents, or any applicable law, on any matter involving the exposure of persons or property to hazardous waste. However, if the breach of contract exposing persons or property to hazardous waste is due solely to an ordinary, unintentional, and non-reckless failure to exercise reasonable care, then the procedures for termination for cause shall apply without modification.

END OF DOCUMENT

DOCUMENT 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Site Access Conditions and Requirements;

B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of this Contract consists of the following:

Exterior paint of complete campus, sealing of masonry, distribution of electrical outlets to classroom wings, abatement of existing classroom wing floors, installation of new LVT flooring, interior paint of classrooms, cleaning and buffing of interior shop floors, removal and replacement of concrete walkway in front of classrooms for ADA compliance, removal of existing Marquee and installation of new marquee, rework of existing HVAC duct controls and replacement of rooftop AC unit in building A and all other work identified in the plans and specifications. Engineers estimate for this project is $ 4,100,000.

1.03 CONTRACTS

A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

(1) NONE

1.05 CODES, REGULATIONS, AND STANDARDS

A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this Project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.

B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS

A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:

(1) Contract Drawings.

(2) Specifications.

(3) Addenda.

(4) Change Orders and other modifications to the Contract.

(5) Reviewed shop drawings, product data, and samples.

(6) Field test records.

(7) Inspection certificates.

(8) Manufacturer's certificates.

B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.

C. Contractor shall record information concurrent with construction progress.

D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:

(1) Manufacturer's name and product model and number.

(2) Product substitutions or alternates utilized.

(3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site and of the streets or roads approaching the Site.

B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.

C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

A. If unoccupied and only with District's prior written approval, Contractor may use the building(s) at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any building(s), Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building(s) while so occupied. Contractor's access to the building(s) shall be limited to the areas indicated.

B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.

C. Contractor shall not interfere with use of or access to occupied portions of the building(s) or adjacent property.

D. Contractor shall maintain corridors, stairs, halls, and other exit-ways of building clear and free of debris and obstructions at all times.

E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.

F. The Contractor shall install the construction fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.

B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.

B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building(s) or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.

B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 21 00

ALLOWANCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-specified work.

1.2 RELATED SECTIONS

A. Document 01 10 00 (Summary of Work)

B. Document 01 29 00 (Payments and Completion)

C. Document 01 32 19 (Submittal Procedures)

1.3 ALLOWANCES

A. Included in the Contract, a stipulated sum/price of **$ 375,000** as an allowance for Unforeseen Conditions within the limits set forth in the Contract Documents. This Allowance shall not be utilized without written approval by the District.

B. Contractor's costs, without overhead and profit, for products, delivery, installation, labor, insurance, payroll, taxes, bonding and equipment rental will be included in Allowance Expenditure Directive authorizing expenditure of funds from this Allowance. No overhead and profit shall be added to the Allowance Expenditure Directive.

C. Funds will be drawn from Allowance only with District approval evidenced by an Allowance Expenditure Directive.

D. At Contract closeout, funds remaining in Allowance will be credited to District by Change Order.

E. Whenever costs are more than the Allowance, the amount covered by the Allowance will be approved at cost. The Contract Price shall be adjusted by Change Order for amounts in excess of the Allowance.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF DOCUMENT

DOCUMENT 01 22 00

ALTERNATES AND UNIT PRICING

PART 4 – ALTERNATES

4.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions;

C. Bid Form and Proposal;

D. Instruction to Bidders.

4.02 DESCRIPTION

The items of work indicated below propose modifications to, substitutions for, additions to and/or deletions from the various parts of the Work specified in other Sections of the Specifications. The acceptance or rejection of any of the alternates is strictly at the option of the District subject to District's acceptance of Contractor's stated prices contained in this Proposal.

4.03 GENERAL

Where an item is omitted, or scope of Work is decreased, all Work pertaining to the item whether specifically stated or not, shall be omitted and where an item is added or modified or where scope of Work is increased, all Work pertaining to that required to render same ready for use on the Project in accordance with intention of Drawings and Specifications shall be included in an agreed upon price amount.

4.04 BASE BID

The Base Bid includes all work required to construct the Project completely and in accordance with the Contract Documents.

4.05 ALTERNATES

None

PART 5 - UNIT PRICING

None

END OF DOCUMENT

DOCUMENT 01 25 13

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 6 - GENERAL

6.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. Instructions to Bidders;

B. General Conditions, including, without limitation, Substitutions For Specified Items; and

C. Special Conditions.

6.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT

A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.

B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.

C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions. The District's Board has found and determined that certain item(s) shall be used on this Project based on the purpose(s) indicated pursuant to Public Contract Code section 3400(c). These findings, as well as the products and brand or trade names, have been identified in the Notice to Bidders.

D. The Contractor will not be allowed to substitute specified items unless the request for substitution is submitted as follows:

(1) District must receive any notice of request for substitution of a specified item a minimum of ten (10) calendar days prior to bid opening.

(2) Within 35 days after the date of the Notice of Award, the Contractor shall submit data substantiating the request(s) for all substitution(s) containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the technical Specifications. Insufficient information shall be grounds for rejection of substitution.

E. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.

F. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.

G. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute.

H. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.

I. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

PART 7 – PRODUCTS Not Used.

PART 8 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE AGREEMENT, GENERAL CONDITIONS, AND SPECIAL CONDITIONS, IF USED, RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES.

END OF DOCUMENT

DOCUMENT 01 29 00

APPLICATION FOR PAYMENT AND CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS

CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.

CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8132)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: $_____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

(1) Retentions.

(2) Extras for which the claimant has not received payment.

(3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): $_____

(4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT
(CIVIL CODE SECTION 8134)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: $_____

Exceptions

This document does not affect any of the following:

1. Retentions.

(5) Extras for which the claimant has not received payment.

(6) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT
(CIVIL CODE SECTION 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check:

Amount of Check: $_____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: $_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT
(CIVIL CODE SECTION 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: $_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

DOCUMENT 01 31 19

PROJECT MEETINGS

PART 9 – GENERAL

9.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions; and

B. Special Conditions.

9.02 PROGRESS MEETINGS:

A. Contractor shall schedule and hold regular weekly progress meetings after a minimum of one week's prior written notice of the meeting date and time to all Invitees as indicated below.

B. Location: Contractor's field office.

C. The Contractor shall notify and invite the following entities ("Invitees"):

(1) District Representative.

(2) Contractor.

(3) Contractor's Project Manager.

(4) Contractor's Superintendent.

(5) Subcontractors, as appropriate to the agenda of the meeting.

(6) Suppliers, as appropriate to the agenda of the meeting.

(7) Construction Manager, if any.

(8) Architect

(9) Engineer(s), if any and as appropriate to the agenda of the meeting.

(10) Others, as appropriate to the agenda of the meeting.

D. The District's and/or the Architect's Consultants will attend at their discretion, in response to the agenda.

E. The District representative, the Construction Manager, and/or another District Agent shall take and distribute meeting notes to attendees and other concerned parties. If exceptions are taken to anything in the meeting notes,

those exceptions shall be stated in writing to the District within five (5) working days following District's distribution of the meeting notes.

9.03 PRE-INSTALLATION/PERFORMANCE MEETING:

A. Contractor shall schedule a meeting prior to the start of each of the following portions of the Work: demolition, painting, HVAC and concrete work. Contractor shall invite all Invitees to this meeting, and others whose work may affect or be affected by the quality of the cutting and patching work.

B. Contractor shall review in detail prior to this meeting, the manufacturer's requirements and specifications, applicable portions of the Contract Documents, Shop Drawings, and other submittals, and other related work. At this meeting, invitees shall review and resolve conflicts, incompatibilities, or inadequacies discovered or anticipated.

C. Contractor shall review in detail Project conditions, schedule, requirements for performance, application, installation, and quality of completed Work, and protection of adjacent Work and property.

D. Contractor shall review in detail means of protecting the completed Work during the remainder of the construction period.

PART 10 - PRODUCTS Not Used.

PART 11 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 32 13

SCHEDULING OF WORK

PART 12 – GENERAL

12.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions;

C. Summary of Work; and

D. Submittals.

12.02 SECTION INCLUDES

A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.

(1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method ("CPM") scheduling ("CPM Schedule").

(2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.

(3) Submit schedules and reports as specified in the General Conditions.

B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

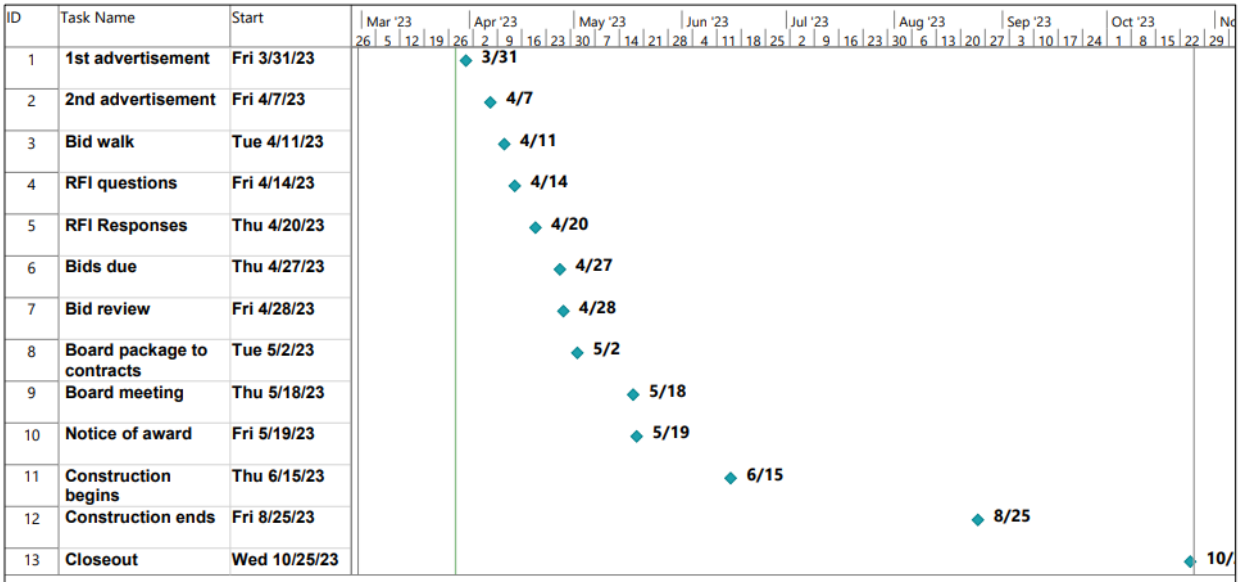
12.03 CONSTRUCTION SCHEDULE

A. Within ten (10) days of issuance of the Notice to Proceed and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.

B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

ACTIVITY DESCRIPTION **REQUIRED COMPLETION**



ID	Task Name	Start
1	1st advertisement	Fri 3/31/23
2	2nd advertisement	Fri 4/7/23
3	Bid walk	Tue 4/11/23
4	RFI questions	Fri 4/14/23
5	RFI Responses	Thu 4/20/23
6	Bids due	Thu 4/27/23
7	Bid review	Fri 4/28/23
8	Board package to contracts	Tue 5/2/23
9	Board meeting	Thu 5/18/23
10	Notice of award	Fri 5/19/23
11	Construction begins	Thu 6/15/23
12	Construction ends	Fri 8/25/23
13	Closeout	Wed 10/25/23

12.04 QUALIFICATIONS

A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of [i.e., Primavera Project Planner]. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.

(1) The written statement shall identify the individual who will perform CPM scheduling.

(2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.

(3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three fourths (¾) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.

B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing of Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

12.05 GENERAL

A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.

B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.

(1) District is not required to accept an early completion schedule, i.e., one that shows an earlier completion date than the Contract Time.

(2) Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

(3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.

C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.

(1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.

(2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.

D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.

E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.

F. Software: Use District Project Planner for Windows, latest version. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.

G. Transmit each item under the form approved by District.

(1) Identify Project with District Contract number and name of Contractor.

(2) Provide space for Contractor's approval stamp and District's review stamps.

(3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

12.06 INITIAL CPM SCHEDULE

A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.

B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.

C. Initial CPM Schedule shall be time scaled.

D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.

E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.

(1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).

(2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.

F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

12.07 ORIGINAL CPM SCHEDULE

A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.

B. Progress Schedule shall include or comply with following requirements:

(1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.

(2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.

(a) Activity durations shall be total number of actual work days required to perform that activity.

(3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.

(4) District furnished materials and equipment, if any, identified as separate activities.

(5) Activities for maintaining Project Record Documents.

(6) Dependencies (or relationships) between activities.

(7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.

(a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.

(b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.

(8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.

(a) Include time for fabrication and delivery of manufactured products for the Work.

(b) Show dependencies between procurement and construction.

(9) Activity description; what Work is to be accomplished and where.

(10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.

(11) Resources required (labor and major equipment) to perform each activity.

(12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.

(13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.

(14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.

(15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.

(16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.

(a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.

(b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.

(c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.

(d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.

(17) Activity durations shall be in Work days.

(18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.

C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.

(1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.

(2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:

(a) Clarifications of Contract Requirements.

(b) Directions to include activities and information missing from submittal.

(c) Requests to Contractor to clarify its schedule.

(3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

12.08 ADJUSTMENTS TO CPM SCHEDULE

A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.

(1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:

(a) Accept schedule and cost and resource loaded activities as submitted, or

(b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.

(2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.

(3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.

(4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.

B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.

(1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.

(2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.

(3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.

C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.

D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

12.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.

(1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.

(2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.

B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.

(1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.

(2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.

(3) Contractor shall plan on the meeting taking no less than four (4) hours.

C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.

D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.

(1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.

(2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.

E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

12.10 SCHEDULE REVISIONS

A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.

B. To reflect revisions to the Schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.

C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.

D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.

E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

12.11 RECOVERY SCHEDULE

A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.

B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.

C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.

D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

12.12 TIME IMPACT EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.

B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.

C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.

D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

12.13 TIME EXTENSIONS

A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.

B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14) calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.

C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.

D. No time will be granted under this Contract for cumulative effect of changes.

E. District will not be obligated to consider any time extension request unless the Contractor complies with the requirements of Contract Documents.

F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.

G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

12.14 SCHEDULE REPORTS

A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.

B. Required Reports:

(1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, Project Float, responsibility code, and the logic relationship of activities.

(2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value- to date, previous payments, and amount earned for current update period.

(3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.

(4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.

(5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.

C. Other Reports:

In addition to above reports, District may request, from month to month, any two of the following reports. Submit four (4) copies of all reports.

(1) Activities by early start.

(2) Activities by late start.

(3) Activities grouped by Subcontractors or selected trades.

(4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.

D. Furnish District with report files on compact disks containing all schedule files for each report generated.

12.15 PROJECT STATUS REPORTING

A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.

B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:

(1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.

(2) Progress made on critical activities indicated on CPM Schedule.

(3) Explanations for any lack of work on critical path activities planned to be performed during last month.

(4) Explanations for any schedule changes, including changes to logic or to activity durations.

(5) List of critical activities scheduled to be performed next month.

(6) Status of major material and equipment procurement.

(7) Any delays encountered during reporting period.

(8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.

(a) Actual resource shall be accumulated in field by Contractor and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.

(b) Contractor shall explain all variances and mitigation measures.

(9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.

(10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

12.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

12.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and man-hours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Upon request of District, furnish computer disk of this data base. Obtain District's written approval of daily construction report data base format prior to implementation. Include in report:

A. Project name and Project number.

B. Contractor's name and address.

C. Weather, temperature, and any unusual site conditions.

D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.

E. Worker quantities for its own Work force and for Subcontractors of any tier.

F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

12.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 13 – PRODUCTS Not Used.

PART 14 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 33 00

SUBMITTALS

PART 15 - GENERAL

15.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;

B. Special Conditions.

15.02 SECTION INCLUDES:

A. Definitions:

(1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.

(2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.

(3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.

B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:

(1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager.

(2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.

(3) Contractor shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.

(4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.

(5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.

(6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.

(7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. Also certify that Contractor-furnished equipment can be installed in allocated space. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Submittals shall not be used as a means of requesting a substitution.

(8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.

(9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

(1) Contractor shall prepare its proposed submittal schedule that is coordinated with the proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.

(2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revise and resubmit", etc.

(3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.

(4) Contractor may be assessed $100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Trade Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule.

15.03 SHOP DRAWINGS:

A. Contractor shall submit one reproducible transparency and six (6) opaque reproductions. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.

B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.

C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.

D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.

E. District shall not review Shop Drawings for quantities of materials or number of items supplied.

F. District's and/or Architect’s review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for dimensions, accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on

Shop Drawings. The District's and/or Architect's review of Shop Drawings is not to be construed as approving departures from Contract Documents.

G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.

H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.

I. Submitted drawings and details must bear stamp of approval of Contractor:

(1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.

(2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked, the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.

J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.

K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.

L. Shop Drawings must clearly delineate the following information:

(1) Project name and address.

(2) Specification number and description.

(3) Architect's name and project number.

(4) Shop Drawing title, number, date, and scale.

(5) Names of Contractor, Subcontractor(s) and fabricator.

(6) Working and erection dimensions.

(7) Arrangements and sectional views.

(8) Necessary details, including complete information for making connections with other Work.

(9) Kinds of materials and finishes.

(10) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.

(1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.

(2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

15.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contract must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.

B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.

C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.

D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.

E. Imported Materials Certification must be submitted at least ten (10) days before material is delivered.

15.05 SAMPLES:

A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.

B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.

(1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.

(2) Samples must show full range of texture, color, and pattern.

C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.

D. Samples to be shipped prepaid or hand-delivered to the District.

E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.

F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.

G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.

H. After a material has been approved, no change in brand or make will be permitted.

I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.

J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.

K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:

(1) Size: As Specified.

(2) Furnish catalog numbers and similar data, as requested.

15.06 REVIEW AND RESUBMISSION REQUIREMENTS:

A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.

B. One (1) copy of product or materials data will be returned to Contractor with the review status.

C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.

D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review. Such resubmittal shall not delay the Work.

E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.

F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.

G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.

H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.

I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 16 – PRODUCTS Not Used.

PART 17 - EXECUTION Not Used.

END OF DOCUMENT

Luther Burbank High School Modernization
Sacramento City Unified School District

SUBMITTAL NO.: ☐

Architect's Project # 3186068-100

DATE: _____

DSA File/Appl. # 34-H7/02-120957

Re-Submittal of Original No.: _____

1. SUBMITTAL TRANSMITTAL

Attention: RGA Project Contact

rga + A studio of HMC Architects

Contractor: Company

Contact: Name

Sub Contractor:

Contact: _____

Please submit only one trade per submittal! **Description of submitted materials:**

Quantity submitted	Specification Section		Description of contents (e.g. product data, shop drawings, samples)
	Section #	Section Title	

Contractor Statement: (read and acknowledge)
This submittal has been reviewed and approved with respect to the means, methods, techniques, and procedures of construction, safety precautions, and program incidentals thereto. This submittal complies with the contract documents and comprises no variations thereto, unless accompanied by a substitution request.

By: _____ **Date**: _____
Name

2. RE-TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ NO EXCEPTIONS TAKEN ☐ REJECTED ☐ FURNISH AS CORRECTED
☐ SUBMIT SPECIFIED ITEM ☐ REVISE AND RESUBMIT ☐ NO ACTION REQUIRED

Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the Drawings and Specifications. This general check is only for the review of conformance with the design concept of the project and general compliance with the information given in the Contract Documents. The Contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his work with that of all the other trades, and performing his work in a safe and satisfactory manner.

Rainforth Grau Architects By: _____ Date: _____

Additional Comments:

See Specification Section 01 3300 for use of this form

Luther Burbank High School Modernization
Sacramento City Unified School District

SUBSTITUTION REQUEST NO.: ☐

Architect's Project # 3186068-100
DSA File/Appl. # 34-H7/02-120957

Date: _____

1. SUBSTITUTION REQUEST

Attention: RGA Project Contact

rga + A studio of HMC Architects

Contractor: Company

Contact: Name

Please submit only one product per request!

Include with a specified product Submittal

Sub Contractor:

Contact: _____

2. PROPOSED SUBSTITUTIONS: The undersigned requests consideration of the following substitution:

Specified Item: _____ **Page No.:** _____ **Paragraph No.:** _____

Proposed Item: _____

3. REASON FOR REQUEST:

4. REQUIREMENTS FOR SUBSTITUTIONS:

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request; applicable portions of data are clearly identified. Attached data also includes a description of changes to Contract Documents, which proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings and does not require design changes in the Contract Documents.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on the work, the schedule or specified warranty requirements.
4. Maintenance and service parts will be readily 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.

_____ _____

Signature - Contractor/Subcontractor Date

5. TRANSMITTAL TO CONTRACTOR:

Distribution: Contractor, Owner, Project Inspector, RGA, Other

☐ **ACCEPTED** ☐ **ACCEPTED AS NOTED** ☐ **REJECTED**

Rainforth Grau Architects By: _____ Date: _____

Comments:

Luther Burbank High School Modernization
Sacramento City Unified School District

RFI NO.: ☐

Architect's Project # 3186068-100
DSA File/Appl. # 34-H7/02-120957

Date: _____

1. REQUEST FOR INFORMATION

Attention: RGA Project Contact

From: Contractor: Company
Contact: Name
Sub Contractor: _____
Contact: _____

Identify related specific references within the Contract Documents and supporting information:

Dwg./Document No.: _____

Building/Site Location: _____

2. Existing Condition (source / reason for the request):

3. Recommended Contractor Action(s) for resolution:

4. Project Inspector Acknowledgment:

Date Reviewed: _____

5. Owner / A/E Resolution(s):

Date of Response: _____ By: _____

Attachments: _____

Extra Work Involved in the Above Described Change? *Yes* ☐ *No* ☐

Distribution: Contractor, Owner, Project Inspector, RGA, Other
See Specification Section 01300 for use of this form

Luther Burbank High School Modernization
Sacramento City Unified School District

E-DATA REQUEST NO.: _____

Architect's Project # 3186068-100
DSA File/Appl. # 34-H7/02-120957

Date: _____

1. ELECTRONIC DATA REQUEST

Attention: RGA Project Contact

From: Contractor: Company
Contact: Name
Sub Contractor:
Contact: _____

2. DATA REQUESTED - Provide list of specific drawings requested (include sheet numbers):

3. REASON FOR REQUEST - Provide clear explanation of why information is desired and for what purpose it will be utilized:

4. ACKNOWLEDGEMENT OF RESPONSIBILITY:

The electronic data files requested are distributed for reference only. Transferring such files can alter, delete or change original information. Accuracy of the data cannot be guaranteed as correct or complete and the Contractor accepts full responsibility for any and all inaccuracies, regardless of cause.

The hard copy documents, including addenda and subsequent written changes to the documents, represent the complete work of the contract and all electronic files should be cross-referenced and verified from that information as electronic files may not contain all contract information. It is the Contractor's responsibility to make any changes or revisions necessary.

This electronic data is furnished without guarantee of compatibility with your hardware or software. It is the Contractor's responsibility to notify the Architect in the event a compatibility problem or disk defect is encountered and a replacement disk is necessary.

This electronic data, in its present form, remains the property of Rainforth Grau Architects and shall not be used for any other purpose than to provide background information for the project noted above. It is not to be released to any other party without the written consent of Rainforth Grau Architects.

Accepted by: _____
Signature - Contractor/Subcontractor

Representing: _____
Contractor/Subcontractor Company Name

CERTIFICATION OF COMPLIANCE FOR BUILDING MATERIALS

This is to certify, in accordance with the Environmental Protection Agency requirements, that the materials and equipment used in the construction of the Luther Burbank High School Improvements for Sacramento City Unified School District of Sacramento County, California, are asbestos free and are, therefore, not subject to monitoring for asbestos contamination.

Project Name: _____

Address: _____

Contractor: _____

Address: _____

Signature: _____

Title: _____

Date: _____

SEPARATE CERTIFICATE IS REQUIRED FOR EACH SITE

DOCUMENT 01 35 13.23

SITE STANDARDS

PART 18 – GENERAL

18.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;

B. Special Conditions;

C. Drug-Free Workplace Certification;

D. Tobacco-Free Environment Certification;

E. Criminal Background Investigation/Fingerprinting Certification;

F. Temporary Facilities and Controls.

18.02 REQUIREMENTS OF THE DISTRICT:

A. Drug-Free Schools and Safety Requirements:

(1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.

(2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school-owned vehicles and vehicles owned by others while on District property. Contractor shall post: "Non-Smoking Area" in a highly visible location in each work area, staging area, and parking area. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.

(3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.

B. Language: Profanity or other unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students, staff, volunteers, parents or public will not be allowed.

C. Disturbing the Peace (Noise and Lighting):

(1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.

(2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for mobile phones or other handheld communication radios.

(3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

(1) Driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more ground guides shall lead the vehicle across the area of travel. In no case shall driving take place across playgrounds or other pedestrian paths during recess, lunch, and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.

(2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.

(3) District shall designate a construction entry to the Site. If Contractor requests, District determines it is required, and to the extent possible, District shall designate a staging area so as not to interfere with the normal functioning of school facilities. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.

(4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur under the drip line of trees or in softscape areas that could otherwise be damaged.

E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 19 - PRODUCTS Not Used.

PART 20 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 41 00

REGULATORY REQUIREMENTS

PART 21 - GENERAL

21.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Obtaining of Permits, Licenses and Registrations and Work to Comply with All Applicable Laws and Regulations;

B. Special Conditions; and

C. Quality Control.

21.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

21.03 REQUIREMENTS OF REGULATORY AGENCIES:

A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction over the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").

(1) California Building Standards Administrative Code, Part 1, Title 24, CCR.

(2) California Building Code (CBC), Part 2, Title 24, CCR; (International Building Code volumes 1-2 and California Amendments).

(3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).

(4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).

(5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).

(6) California Fire Code (CFC), Part 9, Title 24, CCR; (International Fire Code and California Amendments).

(7) California Green Building Standards Code (CALGreen), Part 11, Title 24, CCR.

(8) California Referenced Standards Code, Part 12, Title 24, CCR.

(9) State Fire Marshal Regulations, Public Safety, Title 19, CCR.

(10) Partial List of Applicable National Fire Protection Association (NFPA) Standards:

(a) NFPA 13 - Automatic Sprinkler System.

(b) NFPA 14 - Standpipes Systems.

(c) NFPA 17A - Wet Chemical System

(d) NFPA 24 - Private Fire Mains.

(e) (California Amended) NFPA 72 - National Fire Alarm Codes.

(f) NFPA 253 - Critical Radiant Flux of Floor Covering System.

(g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.

(11) California Division of the State Architect interpretation of Regulations ("DSA IR"), including, without limitation:

(a) DSA IR A-6 — Construction Change Document Submittal and Approval Processes.

(b) DSA IR A-7 — Project Inspector Certification and Approval.

(c) DSA IR A-8 — Project Inspector and Assistant Inspector Duties and Performance.

(d) DSA IR A-12 — Assistant Inspector Approval.

(12) DSA Procedures ("DSA PR")

(a) DSA PR 13-01 – Construction Oversight Process

(b) DSA PR 13-02 – Project Certification Process

B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:

(1) Test and testing laboratory per Section 4-335. District shall pay for the testing laboratory.

(2) Special inspections per Section 4-333(c).

(3) Deferred Approvals per section 4-317(g).

(4) Verified reports per Sections 4-336 & 4-343(c).

(5) Duties of the Architect & Engineers shall be per Sections 4-333(a) and 4-341.

(6) Duties of the Contractor shall be per Section 4-343.

(7) Duties of Project Inspector shall be per Section 4-334.

(8) Addenda and Construction Change Documents per Section 4-338.

Contractor shall keep and make available all applicable parts of the most current version of Title 24 referred to in the plans and specifications at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

(1) Contractor shall submit the following to Architect for review and endorsement:

(a) Product information on proposed material/system supplier.

(b) Drawings, specifications, and calculations prepared, signed, and stamped by an architect or engineer licensed in the State of California for that portion of the Work.

(c) All other requirements as may be required by DSA.

(2) Cost of preparing and submitting documentation per DSA Deferred Approval requirements including required modifications to Drawings and Specifications, whether or not indicated in the Contract Documents, shall be borne by Contractor.

(3) Contractor shall not begin fabrication and installation of deferred approval items without first obtaining DSA approval of Drawings and Specifications.

(4) Schedule of Work Subject to DSA Deferred Approval: Window wall systems exceeding 10 feet in span.

PART 22 – PRODUCTS Not Used.

PART 23 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 42 13

ABBREVIATIONS AND ACRONYMS

PART 24 – GENERAL

24.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions including without limitation, Definitions;

B. Special Conditions.

24.02 DOCUMENT INCLUDES:

A. Abbreviations used throughout the Contract Documents.

B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	The Aluminum Association
2.	AASHTO	American Association of State Highway and Transportation Officials
3.	ABPA	Acoustical and Board Products Association
4.	ACI	American Concrete Institute
5.	AGA	American Gas Association
6.	AGC	Associated General Contractors of America
7.	AHC	Architectural Hardware Consultant
8.	AHRI	Air Conditioning, Heating, Refrigeration Institute
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AMCA	Air Movement and Control Association
14.	ANSI	American National Standards Institute
15.	APA	APA – The Engineered Wood Association
16.	ASCE	American Society of Civil Engineers
17.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
18.	ASME	American Society of Mechanical Engineers
19.	ASTM	American Society of Testing and Materials International
20.	AWPA	American Wood Protection Association
21.	AWPI	American Wood Preservers Institute
22.	AWS	American Welding Society
23.	AWSC	American Welding Society Code
24.	AWI	Architectural Woodwork Institute
25.	AWWA	American Water Works Association
26.	BIA	The Brick Industry Association

27.	CCR	California Code of Regulations
28.	CLFMI	Chain Link Fence Manufacturers Institute
29.	CRA	California Redwood Association
30.	CRSI	Concrete Reinforcing Steel Institute
31.	CS	Commercial Standards
32.	CSI	Construction Specifications Institute
33.	CTI	Cooling Technology Institute
34.	FGIA	Fenestration and Glazing Industry Alliance
35.	FGMA	Flat Glass Manufacturers' Association
36.	FIA	Factory Insurance Association
37.	FM	Factory Mutual Global
38.	FS/FED SPEC	Federal Specification
39.	FTI	Facing Title Institute
40.	GA	Gypsum Association
41.	IAPMO	International Association of Plumbing and Mechanical Officials
42.	ICC	International Code Council
43.	IEEE	Institute of Electrical and Electronics Engineers
44.	IES	Illuminating Engineering Society
45.	MCAC	Mason Contractors Association of California
46.	MIMA	Mineral Wool Insulation Manufacturers Association
47.	MLMA	Metal Lath Manufacturers Association
48.	MS/MIL SPEC	Military Specifications
49.	NAAMM	National Association of Architectural Metal Manufacturers
50.	NBHA	National Builders Hardware Association
51.	NCMA	National Concrete Masonry Association
52.	NCSEA	National Council of Structural Engineers Associations
53.	NEC	National Electrical Code
54.	NEMA	National Electrical Manufacturers Association
55.	NIST	National Institute of Standards and Technology
56.	NSI	Natural Stone Institute
57.	NTMA	National Terrazzo and Mosaic Association, Inc.
58.	ORS	Office of Regulatory Services (California)
59.	OSHA	Occupational Safety and Health Act
60.	PCI	Precast/Prestressed Concrete Institute
61.	PCA	Portland Cement Association
62.	PCA	Painting Contractors Association
63.	PDI	Plumbing Drainage Institute
64.	PEI	Porcelain Enamel Institute, Inc.
65.	PG&E	Pacific Gas & Electric Company
66.	PS	Product Standards
67.	SDI	Steel Door Institute; Steel Deck Institute
68.	SJI	Steel Joist Institute
69.	SSPC	Society for Protective Coatings
70.	TCNA	Tile Council of North America, Inc.
71.	TPI	Truss Plate Institute
72.	UBC	Uniform Building Code
73.	UL	Underwriters Laboratories Code

74.	UMC	Uniform Mechanical Code
75.	USDA	United States Department of Agriculture
76.	VI	Vermiculite Institute
77.	WCLIB	West Coast Lumber Inspection Bureau
78.	WDMA	Window and Door Manufacturers Association
79.	WEUSER	Western Electric Utilities Service Engineering Requirements
80.	WIC	Woodwork Institute of California

PART 25 - PRODUCTS Not Used.

PART 26 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 42 16

DEFINITIONS

PART 27 - GENERAL

27.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions including without limitation, Definitions;

B. Special Conditions.

27.02 QUALITY ASSURANCE

A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.

B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.

C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.

D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.

E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and/or the Architect before proceeding.

F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.

G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

DOCUMENT 01 42 19

REFERENCES

PART 28 - GENERAL

28.01 SCHEDULE OF REFERENCES:

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	The Aluminum Association 1400 Crystal Drive, Suite 430 Arlington, VA 22202 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 2401 Pennsylvania Avenue NW, Suite 330 Washington, DC 20037 www.aabc.com	202/737-0202
AASHTO	American Association of State Highway and Transportation Officials 555 12th St. NW - Suite 1000 Washington, DC 20004 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215Research Triangle Park, NC 27709-2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 901 New York Ave., NW, Suite 300 West Washington, DC 20001 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.concrete.org	248/848-3800
ACPA	American Concrete Pipe Association 5605 N. MacArthur Blvd., Suite 340 Irving, TX 75038 www.concrete-pipe.org	972/506-7216

ADC	Air Duct Council 1901 N. Roselle Road, Suite 800 Schaumburg, IL 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1101 K Street, NW, Suite 700 Washington, DC 20005 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW, Suite 450 Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 http://domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction 130 East Randolph Street, Suite 2000 Chicago, IL 60601 www.aisc.org	312.670.2400
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452-7100
AITC	American Institute of Timber Construction 1010 South 336th Street, #210 Federal Way, WA 98003-7394 https://www.plib.org/aitc/	253/835-3344

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. 7470 New Technology Way, Suite F Frederick, MD 21703 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
AMPP (formerly SSPC)	Association for Materials Protection and Performance (merger of Society for Protective Coatings and National Association of Corrosion Engineers International) (formerly Steel Structures Painting Council) 800 Trumbull Drive Pittsburgh, PA 15205 www.sspc.org	412/281-2331 877/281-7772
ANLA	AmericanHort (merger of American Nursery & Landscape Association and OFA – The Association of Horticultural Professionals) 2130 Stella Court Columbus, OH 43215 www.americanhort.org	614/487-1117
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 www.ansi.org	202/293-8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600

APA	Architectural Precast Association 325 John Knox Rd, Suite L-103 Tallahassee, FL 32303 www.archprecast.org	850/205-5637
APCIA	American Property Casualty Insurance Association (merger of American Insurance Association (formerly the National Board of Fire Underwriters) with the Property Casualty Insurers Association of America) 555 12th St, NW, Suite 550 Washington DC 20004 www.apci.org	202/828-7100
AHRI	Air Conditioning and Refrigeration Institute (now Air-Conditioning, Heating, & Refrigeration Institute) 2311 Wilson Blvd, Suite 400 Arlington, VA 22201 www.ahrinet.org	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association 2331 Rock Spring Road Forest Hill, MD 21050 www.asphaltroofing.org	443/640-1075
ASA	The Acoustical Society of America Suite 300 1305 Walt Whitman Road Melville, NY 11747-4300 https://acousticalsociety.org/	516/576-2360
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 180 Technology Parkway Peachtree Corners, GA 30092 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990 www.asme.org	800/834-2763

ASPE	American Society of Plumbing Engineers 6400 Shafer Court, Suite 350 Rosemont, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 18927 Hickory Creek Dr., Suite 220 Mokena, IL 60448 www.asse-plumbing.org	708/995-3019
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association (formerly American Wood Preservers Institute) P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077
AWS	American Welding Society 8669 NW 36 Street, Suite 130 Miami, FL 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794-7711

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th Floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 12007 Sunrise Valley Drive, Suite 430 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 8484 Westpark Drive, Suite 220 McLean, VA 22102 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 2401 Fieldcrest Dr. Mundelein, IL 60060 www.cispi.org	224/864-2910
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 chainlinkinfo.org	301/596-2583
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176 www.compositepanel.org	703/724-1128
CPSC	Consumer Product Safety Commission 4330 East-West Highway Bethesda, MD 20814 www.cpsc.gov	800/638-2772
CRA	California Redwood Association 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.calredwood.org	925/935-1499

CRI	Carpet and Rug Institute 100 S. Hamilton Street Dalton, GA 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173-4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 123 North Pitt St, Suite 450 Alexandria, VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHA	Decorative Hardwoods Association (formerly Hardwood Plywood & Veneer Association) 42777 Trade West Dr. Sterling, VA 20166 https://www.decorativehardwoods.org/	703/435-2900
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 2001 K Street NW, 3rd Floor North Washington, DC 20006 www.dhi.org	202/367-1134
DIPRA	Ductile Iron Pipe Research Association P.O. Box 190306 Birmingham, AL 35219 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, DC 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591 www.ejma.org	914/332-0040

EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 800 Roosevelt Rd., Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.fcica.com	630/672-3702
FGIA	Fenestration and Glazing Industry Alliance 1900 E Golf Rd, Suite 1250 Schaumburg, IL 60173 https://fgiaonline.org/	847/303-5664
FM Global	Factory Mutual Insurance Company Amy Daley Global Practice Leader – Education, Public Entities, Health Care FM Global 270 Central Avenue Johnston, RI 02919-4949 www.fmglobal.com	401/275-3000 401/275-3029
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 962 Wayne Ave., Suite 620 Silver Spring, MD 20910 www.gypsum.org	301/277-8686
HMA	Hardwood Manufacturers Association One Williamsburg Place, Suite 108 Warrendale, PA 15086 http://hmamembers.org	412/244-0440

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association P.O. Box 1906 Alexandria, VA 22313 https://insulationinstitute.org/	703/684-0084
NALP	National Association of Landscape Professionals (formerly Professional Landcare Network) 12500 Fair Lakes Circle, Suite 200 Fairfax, VA 22033 https://www.landscapeprofessionals.org/	703/736-9666
NAPA	National Asphalt Pavement Association 6406 Ivy Lane, Suite 350 Greenbelt, MD 20770-1441 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 1201 Pennsylvania Ave. NW Washington, D.C., 20004 www.necanet.org	202/991-6300
NEMA	National Electrical Manufacturers Association 1300 North 17th Street N, Suite 900 Rosslyn, VA 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 5537 SW Urish Road Topeka, KS 66610 https://nationalelevatorindustry.org/	703/589-9985
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA02169-7471 www.nfpa.org	800/344-3555 855/274-8525

NGA (formerly GANA)	National Glass Association (merged with Glass Association of North America) 1945 Old Gallows Road Suite 750 Vienna, VA 22182 www.glass.org	866/342-5642 Ext 127
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818
NIA	National Insulation Association 516 Herndon Pkwy., Ste. D Herndon, VA 20170 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International 789 N. Dixboro Road Ann Arbor, MI 48113-0140 www.nsf.org	800/673-6275 734/769-8010
NSI	Natural Stone Institute (formerly Marble Institute of America) 380 E. Lorain St. Oberlin, OH 44074 https://www.naturalstoneinstitute.org/	440/250-9222
NTMA	National Terrazzo and Mosaic Association 209 N. Crockett Street, Suite 2 PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, DC 20210 www.osha.gov	800/321-OSHA (6742)

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 200 Massachusetts Ave NW, Suite 200 Washington, DC 20001 www.cement.org	847/966-6200 202/408-9494
PCA	Painting Contractors Association (formerly Painting and Decorating Contractors of America) 2316 Millpark Drive Maryland Heights, MO 63043 https://www.pcapainted.org/	800/322-7322
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave., Suite 1150 Chicago, IL 60631 www.pci.org	312/786-0300
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366
PG&E	Pacific Gas & Electric Company P.O. Box 997300 Sacramento, CA 95899-7300 www.pge.com	800/743-5000
PLIB	Pacific Lumber Inspection Bureau (formerly West Coast Lumber Inspection Bureau) 1010 South 336th Street, Suite 210 Federal Way, WA 98003-7394 https://www.plib.org/	253/835-3344
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange, GA 30240 www.rfci.com	706/882-3833
SDI	Steel Deck Institute P.O. Box 426 Glenshaw, PA 15116 www.sdi.org	412/487-3325

SDI	Steel Door Institute 30200 Detroit Road Westlake, OH 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 140 West Evans Street, Suite 203 Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 5753 E Santa Ana Cyn Rd, #G-156 Anaheim, CA 92807 www.stuccomfgassoc.com	714/473-9579
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1425 K St. NW, Suite 500 Washington, DC 20005 www.plasticsindustry.org	202/974-5200
TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 2670 Crain Highway, Suite 203 Waldorf, MD 20601 www.tpinst.org	240/587-5582
TPI	Turfgrass Producers International 444 E. Roosevelt Road #346 Lombard, IL 60148 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 670 N Commercial Street, Suite 201 Manchester, NH 03101 www.tcia.org	603/314-5380 800/733-2622

TVI	The Vermiculite Institute c/o The Schundler Company 10 Central Street Nahant, MA 01908 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 201 E. John Carpenter Freeway, Suite 750 Irving, TX 75062 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 35 E Wacker Dr., Suite 850 Chicago, IL 60601 www.wallcoverings.org	312/224-2574
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, NY 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 2001 K Street NW, 3rd Floor North Washington, D.C. 20006 www.wdma.com	202/367-1157
WI	Woodwork Institute 1455 Response Road, Suite 110 Sacramento, CA 95815 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street, Suite 300 Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, CA 92865 www.wwcca.org	714/221-5520

WWPA	Western Wood Products Association (formerly Redwood Inspection Service) 1500 SW First Ave., Suite 870 Portland, OR 97201 www.wwpa.org	503/224-3930

PART 29 - PRODUCTS Not Used.

PART 30 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 43 00

MATERIALS AND EQUIPMENT

PART 31 - GENERAL

31.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Purchase of Materials and Equipment;

B. Special Conditions;

C. Imported Materials Certification.

31.02 MATERIAL AND EQUIPMENT

A. Only items approved by the District and/or Design Professional shall be used.

B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

31.03 MATERIAL AND EQUIPMENT COLORS

A. The District and/or Architect will provide a schedule of colors.

B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

31.04 DELIVERY, STORAGE, AND HANDLING

A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.

B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.

C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

D. Materials are not acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.

E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, access to the Site or buildings, and underground services. Contractor shall protect material and equipment furnished under Contract.

F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.

G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 32 - PRODUCTS

32.01 MANUFACTURERS

A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.

B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

32.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

32.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 33 - EXECUTION

33.01 WORKMANSHIP

A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).

B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

33.02 COORDINATION

A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.

B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

33.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. For example, electric water coolers require water, electricity, and drain services; roof drains require drain system; sinks fit within countertop, etc. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

33.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

33.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative. Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

DOCUMENT 01 45 00

QUALITY CONTROL

PART 34 - GENERAL

34.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;

B. Special Conditions.

34.02 RELATED CODES:

A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.

B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

34.03 OBSERVATION AND SUPERVISION:

A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.

B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:

(1) The Project Inspector and Special Inspector(s) shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and operation of equipment as needed, and access as required and shall provide assistance for sampling or measuring materials.

(2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.

(3) The Project Inspector shall observe and monitor all testing and inspection activities required.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343. The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

34.04 TESTING AGENCIES:

A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.

B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."

C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.

34.05 TESTS AND INSPECTIONS:

A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.

B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.

C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:

(1) Tests and observations for earthwork and paving.

(2) Tests for concrete mix designs, including tests of trial batches.

(3) Tests and inspections for structural steel work.

(4) Field tests for framing lumber moisture content.

(5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.

(6) Tests and observations of welding and expansion anchors.

D. The District may at its discretion, pay and then back charge the Contractor for:

(1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.

(2) Uncovering of work in accordance with Contract Documents.

(3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.

(4) Testing done off Site.

E. Testing and inspection reports and certifications:

(1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.

(a) The District;

(b) The Construction Manager, if any;

(c) The Architect;

(d) The Consulting Engineer, if any;

(e) Other engineers on the Project, as appropriate;

(f) The Project Inspector; and

(g) The Contractor.

(2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

PART 35 - PRODUCTS

35.01 TYPE OF TESTS AND INSPECTIONS

A. Testing and inspection shall be in accordance with DSA Form 103 (or current version)

B. Slump Test
ASTM C 143

C. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

(1) Compressive Strength:

(a) Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).

(b) Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.

(c) Concrete shall test the minimum ultimate compressive strength in twenty-eight 28 days, as specified on the structural drawings.

(d) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.

(e) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

D. Reinforcing, Steel

E. Structural Steel Per Title 24 and as noted:

(1) Material: Steel per Table in Title 24, Section 2712.

(2) Qualification of Welders (UBC Std. 27-6).

(3) Shop fabrication (Section 2712(d). Structural steel only).

(4) Shop and field welding (Section 2712(e)).

PART 36 - EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Testing for Moisture Vapor Emission Rate (MVER), relative humidity, alkalinity, and porosity of concrete floors scheduled to receive applied floor coverings or sealers.

1.2 RELATED REQUIREMENTS

A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

C. Division 09 flooring Sections specifying adhered flooring and accessories requiring moisture and pH testing.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. ASTM International (ASTM)

1. C1077, Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.
2. E329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
3. F710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
4. F1869, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
5. F2170, Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
6. F3191: Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrates to Receive Resilient Flooring.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Indicate proposed test locations on building floor plans.

B. Product Data: Manufacturer's descriptive literature for each type of product to be used by testing laboratory for each testing procedure. Include:

1. Model, manufacturer, and calibration record for relative humidity measuring equipment.
2. Model and manufacturer for calcium chloride test kits.
3. Data for floor slab treatment products.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For independent testing agency if other than preapproved laboratory is proposed to be used.

B. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

C. Test Reports: Testing Laboratories test results complying with the following.

1. Report test results in chart form.
2. Relative Humidity Test Method: Indicate test dates, time, depth of test well, in-situ temperature, relative humidity and pH levels.
3. Calcium Chloride Test Method: Indicate test dates, start/stop time, start/stop weight, weight gain in grams, water vapor emission rate, and pH levels.
4. Environmental Conditions: Record of ambient air temperature, ambient relative humidity, and floor slab surface temperature when test sites are prepared, start of test, and end of test.
5. Indicate condition of building enclosure including position of operable windows and exterior doors when test sites are prepared, start of test, and end of test.
6. Indicate operational status of HVAC systems maintaining environmental condition of spaces where tests are conducted when test sites are prepared, start of test, and end of test.

1.7 QUALITY ASSURANCE

A. The Contractor or installer may not conduct testing for concrete slab moisture content, alkalinity, and pH level. These tests shall be provided by the Contractor through an independent third party testing laboratory retained and paid for by the Contractor. Contractor shall provide access for and cooperate with the preapproved testing lab.

B. Testing Laboratory Qualifications: An independent agency in business for at least 10 years that employs field personnel trained and qualified according to ASTM C1077 and ASTM E329 for testing indicated, and who are qualified to diagnose and resolve concrete slab moisture problems that cause flooring failures.

1. The following testing laboratory has been preapproved by the Architect.

   Independent Floor Testing & Inspection, Inc. (IFTI)
   2300 Clayton Rd. Suite 1240
   Concord, CA 94520
   Phone: 800-490-3657
   Email: info@ifti.com

2. If the Contractor requests an alternative testing laboratory, the Contractor must submit the name and qualifications of the proposed alternative testing lab at least 45 calendar days prior to first scheduled test. The Architect reserves the right to reject the alternative testing laboratory due to lack of experience or qualifications.

1.8 FIELD CONDITIONS

A. Ambient Conditions:

1. Do not perform concrete moisture testing until building is enclosed and HVAC system is operational. Maintain building test areas at design operating conditions for minimum 48 hours before, during, and continuously after conducting testing.
2. When HVAC system is not operational at start of tests, maintain ambient conditions within test areas at 65 to 85 degrees F and 40 to 60 percent relative humidity for minimum 48 hours before, during, and continuously after conducting testing until building HVAC system is capable of maintaining design operating conditions.

PART 2 - PRODUCTS

2.1 MATERIALS FOR TEST PROCEDURES

A. Relative Humidity (RH) Test Equipment: A probe that has been verified for accuracy within the past year by Vaisala, Wagner Meters, or equal.

B. Calcium Chloride Test Kits: Pre-packaged and of commercial consistency complying with ASTM F1869 by American Moisture Test, Inc., Irvine, CA, Taylor Tools, or equal. Kit shall include sealed dish of anhydrous calcium chloride, a metering dome with gasket, and instructions.

C. Alkalinity (pH) Tests: pH meter by American Moisture Test, Inc., Irvine, CA, Taylor Tools, or equal pH meter, or test kit by Micro Essential Laboratory, or equal complying with the following.

1. pH Test Paper: Capable of indicating minimum 7.0 to 13 pH range.
2. pH Color Gage: Furnish pH test paper manufacturer's visual color gage to identify measured pH.
3. Water: Distilled or de-ionized.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify new concrete floors have cured for minimum 28 days.

3.2 PREPARATION

A. Perform concrete moisture content and pH testing in the same temperature and humidity environment that the floor covering will be in when the building is in service.

B. When a building HVAC system is not operational and maintaining test areas at design operational conditions, install recording hygrometer or data logger in each separate test area to record ambient temperature and relative humidity beginning 48 hours before start of tests until completion of tests within each area.

C. Identify three moisture test sites for first 1,000 square feet and one moisture test site for each additional 1,000 square feet of floor area receiving floor covering on each separate floor slab with consideration to separation of test area. Layout test site locations uniformly distributed throughout each test area.

D. Mechanically clean each test site to remove oils, laitance, curing compounds, adhesives, and other contaminates affecting water vapor emissions.

1. Remove cleaning residue.
2. Do not apply water or other liquid to floor slabs and test sites during cleaning process.

3.3 TESTING

A. General:

1. For slab-on-grade, above-grade concrete, and existing concrete subfloors scheduled to receive any kind of floor finish material, perform moisture content and pH testing to confirm that substrate is ready to receive the specific finish materials.
2. Perform concrete slab moisture and pH testing utilizing specified ASTM testing methods and practices.
3. Following testing, the testing laboratory must submit a report of its testing. In addition to copy to be submitted to Architect, testing laboratory shall submit its

report to the Contractor and respective flooring installation subcontractors a minimum of 10 business days prior to scheduled installation date of flooring.

4. Installation of flooring at tested areas may not begin without Architect's review and approval of the testing results.

B. Relative Humidity Testing: Perform tests in accordance with ASTM F2170 and as follows.

1. General:
   a. Permit the test site to acclimate for minimum 72 hours before measuring relative humidity.
   b. Verify concrete slabs are up to service temperature at least 48 hours prior to testing.
2. Conduct relative humidity testing at the following depths:
   a. Basement Slabs and Slabs-On-Grade: Measure temperature and relative humidity at 40 percent of slab thickness measured from top surface.
   b. Elevated Slabs: Measure temperature and relative humidity at 20 percent of slab thickness measured from top surface.
3. Drill test hole at each test site to accommodate test sleeve.
   a. Hole Diameter: In accordance with test equipment manufacturer's instructions.
   b. Drilling Fluids: Not permitted.
4. Vacuum dust and debris from test hole.
5. Insert sleeve, to the full depth of test hole. Cap or plug sleeve to prevent test hole contamination.
6. Remove sleeve plug and insert probe to bottom of test hole.
   a. Allow test probe to reach temperature equilibration with concrete slab.
   b. Elapsed time for test shall be 48 hours.
7. Measure and record temperature and relative humidity at the test site.

C. Calcium Chloride Testing: Perform tests in accordance with ASTM F1869.

D. Alkalinity Testing: Perform tests using a pH meter or using procedures included in ASTM F710-19 and as follows.

1. Place several drops of water onto the concrete surface to form a puddle approximately 1 inch in diameter.
2. Allow the water to set for approximately 60 seconds.
3. After 60 seconds, dip the pH paper into the water and remove immediately, compare color to chart provided by paper supplier to determine pH reading.
4. Record and report results.

E. Acceptable Criteria:

1. Concrete floor slabs will be considered acceptable for installation of floor finishes when accepted by flooring installers and when:

a. Relative Humidity Test Result: 75 percent maximum relative humidity.

b. Alkalinity Test Result: pH within range of 7.0 to 9.0.

c. Calcium Chloride Test Result: 3 lbs of water/1000 sf (1.36 kg of water/92.9 sq. m) in 24 hours maximum moisture vapor transmission rate.

F. Where tests are not satisfactory and substrates exceed the limits required by the respective floor material manufacturer, do not proceed with installation. Notify Architect for review of conditions and to determine a resolution acceptable to the Architect and Owner including whether application of a topical barrier coat as specified in Section 09 0561, Moisture Vapor Control System, would be required.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Requirements for Testing Laboratory.
2. Contractor's responsibilities for facilitation of Testing and Inspections.

1.2 RELATED SECTIONS AND DOCUMENTS

A. Geologic Hazards & Soils Report.

B. DSA 103 - Structural Test & Inspections List.

C. Section 13 3423, Relocatable Buildings.

D. Division 23, Mechanical Work - Testing, adjusting, and balancing of systems.

E. Section 31 0000, Earthwork.

F. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 REFERENCES

A. California Administrative Code (CAC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

B. California Building Code (CBC), edition as noted on the drawings, as adopted by the California Division of the State Architect (DSA).

1.4 SELECTION AND PAYMENT

A. Testing laboratory shall be approved by both the Architect and the Division of the State Architect.

B. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing. Retesting costs for failed tests will be the Contractors responsibility and will be back-charged against the contract.

C. Under provisions for Relocatable Building construction, Owner limits his exposure to in-plant inspection and testing costs. Refer to other Specification Sections related to such specific construction.

D. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.5 LABORATORY REPORTS

A. After each inspection and test, promptly submit two copies of laboratory report to Owner, Architect, Contractor and DSA.

B. Include:

1. Date of issue,
2. DSA Application and File numbers,
3. Project title and number,
4. Name of inspector,
5. Date and time of sampling or inspection,
6. Identification of product and Specification Section,
7. Location in the Project,
8. Type of inspection or test,
9. Date of test,
10. Results of test,
11. Conformance with Contract Documents.

C. When requested by Architect, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.

B. Laboratory may not approve or accept any portion of the work.

C. Laboratory may not assume any duties of Contractor.

D. Laboratory has no authority to stop the work.

1.7 CONTRACTOR RESPONSIBILITIES

A. Deliver to laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs. Allow reasonable time for review and testing.

B. Arrange for, and coordinate with, laboratory for all required testing and inspection. Provide adequate notice, in advance, for proper scheduling and processing of testing. The Inspector will not be responsible for scheduling or arranging for testing and inspection services.

C. Cooperate with laboratory personnel, and provide access to the work and to manufacturer's facilities.

D. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at the source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.

E. Notify Architect, Inspector, Structural Engineer (when applicable) and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

END OF SECTION

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2022 CBC

Application Number:	**School Name:**	**School District:**
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

2022 CBC

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2022 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required **Periodic** – Indicates that a periodic special inspection is required **Test** – Indicates that a test is required	**GE (Geotechnical Engineer)** – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative. **LOR (Laboratory of Record)** – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335. **PI (Project Inspector) –** Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA. **SI (Special Inspection)** – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number:	**School Name:**	**School District:**
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

Geotechnical Reports: Project does NOT have and does NOT require a geotechnical report

	S1. GENERAL:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify that: • Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations. • Foundation excavations are extended to proper depth and have reached proper material. • Materials below footings are adequate to achieve the design bearing capacity.	**See Notes**	**PI**	Refer to specific items identified in the Appendix listing exemptions for limitations. Placement of controlled fill exceeding 12" depth under foundations is not permitted without a geotechnical report.

	S2. SOIL COMPACTION AND FILL:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.	**Continuous**	**LOR***	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.
☑	**b.** Compaction testing.	**Test**	**LOR***	* Under the supervision of a geotechnical engineer or LOR's engineering manager. Refer to specific items identified in the Appendix listing exemptions for limitations.

	S3. DRIVEN DEEP FOUNDATIONS (PILES):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Verify pile materials, sizes and lengths comply with the requirements.	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative.
☐	**b.** Determine capacities of test piles and conduct additional load tests as required.	**Test**	**LOR***	* Under the supervision of the geotechnical engineer.

Application Number:	**School Name:**	**School District:**
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	**c.** Inspect driving operations and maintain complete and accurate records for each pile.	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative.
☐	**d.** Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative.
☐	**e.** Steel piles.	Provide tests and inspections per STEEL section below.		
☐	**f.** Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.		
☐	**g.** For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.

	S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Note**
☐	**a.** Inspect drilling operations and maintain complete and accurate records for each pier.	**Continuous**	**PI**	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
☐	**b.** Verify pier locations, diameters, plumbness and lengths.Record concrete or grout volumes.	**Continuous**	**PI**	Continuous inspection to be provided by project inspector. Refer to specific items identified in the Appendix listing exemptions for limitations.
☐	**c.** Concrete piers.	Provide tests and inspections per CONCRETE section below.		

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2022 CBC

Table 1705A.6, Table 1705A.7, Table 1705A.8

Application Number:	**School Name:**	**School District:**
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
	S5. RETAINING WALLS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Placement, compaction and inspection of backfill.	**Continuous**	**GE***	**1705A.6.1.** * By geotechnical engineer or his or her qualified representative. (See section S2 above).
☐	**b.** Placement of soil reinforcement and/or drainage devices.	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative.
☐	**c.** Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative. See DSA IR 18-2.
☐	**d.** Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
☐	**e.** Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	S6. OTHER SOILS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Soil Improvements	**Test**	**GE***	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS (California Geological Survey) for final acceptance. * By geotechnical engineer or his or her qualified representative.
☐	**b.** Inspection of Soil Improvements	**Continuous**	**GE***	* By geotechnical engineer or his or her qualified representative.
☐	**c.**			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number:	**School Name:**	**School District:**
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

	C1. CAST-IN-PLACE CONCRETE			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify use of required design mix.	**Periodic**	**SI**	**Table 1705A.3 Item 5, 1910A.1.**
☑	**b.** Identifiy, sample, and test reinforcing steel.	**Test**	**LOR**	**1910A.2;** ACI 318-19 Ch.20 and Section 26.6.1.2; DSA IR 17-10. (See Appendix (end of this form) for exemptions.)
☑	**c.** During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	**Test**	**LOR**	**Table 1705A.3 Item 6**; ACI 318-19 Sections 26.5 & 26.12.
☑	**d.** Test concrete (f'_c).	**Test**	**LOR**	**1905A.1.17;** ACI 318-19 Section 26.12.
☑	**e.** Batch plant inspection: **Periodic**	**See Notes**	**SI**	Default of **'Continuous'** per **1705A.3.3**. If approved by DSA, batch plant inspection may be reduced to **'Periodic'** subject to requirements in Section **1705A.3.3.1,** or eliminated per **1705A.3.3.2.** See IR 17-13. (See Appendix (end of this form) for exemptions.)
☐	**f.** Welding of reinforcing steel.	Provide special inspection per STEEL, Category S/A4(d) & (e) and/or S/A5(g) & (h) below.		

	C2. PRESTRESSED / POST-TENSIONED CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Sample and test prestressing tendons and anchorages.	**Test**	**LOR**	**1705A.3.4, 1910A.3**
☐	**b.** Inspect placement of prestressing tendons.	**Periodic**	**SI**	**1705A.3.4, Table 1705A.3 Items 1 & 9.**

	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	**c.** Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	**Periodic**	**SI**	**Table 1705A.3 Item 13.** Special inspector to verify specified concrete strength test prior to stressing.
☐	**d.** Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	**Continuous**	**SI**	**1705A.3.4, Table 1705A.3 Item 9;** ACI 318-14 Section 26.13

	C3. PRECAST CONCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect fabrication of precast concrete members.	**Continuous**	**SI**	ACI 318-19 Section 26.13.
☐	**b.** Inspect erection of precast concrete members.	**Periodic**	**SI***	**Table 1705A.3 Item 10.** * May be performed by PI when specifically approved by DSA.
☐	**c.** For precast concrete diaphragm connections or reinforcement at joints classified as moderate or high deformability elements (MDE or HDE) in structures assigned to Seismic Design Category D, E or F, inspect such connections and reinforcement in the field for: 1. Installation of the embedded parts 2. Completion of the continuity of reinforcement across joints. 3. Completion of connections in the field.	**Continuous**	**SI**	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5
☐	**d.** Inspect installation tolerances of precast concrete diaphragm connections for compliance with ACI 550.5.	**Periodic**	**SI**	Table 1705A.3; ACI 318-19 Section 26.13.1.3; ACI 550.5

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (CONCRETE), 2022 CBC

Table 1705A.3; ACI 318-19 Sections 26.12 & 26.13

Application Number:	**School Name:**	**School District:**
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

	C4. SHOTCRETE (IN ADDITION TO SECTION C1):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect shotcrete placement for proper application techniques.	**Continuous**	**SI**	**1705A.3.9, Table 1705A.3 Item 7, 1908A.1, 1908A.2, 1908A.3.** See ACI 506.2-13 Section 3.4, ACI 506R-16.
☐	**b.** Sample and test shotcrete (f'_c).	**Test**	**LOR**	**1908A.2, 1705A.3.9**

	C5. POST-INSTALLED ANCHORS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Inspect installation of post-installed anchors	**See Notes**	**SI***	**1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8** (See Appendix (end of this form) for exemptions). ACI 318-14 Sections 17.8 & 26.13. * May be performed by the project inspector when specifically approved by DSA.
☑	**b.** Test post-installed anchors.	**Test**	**LOR**	**1910A.5.** (See Appendix (end of this form) for exemptions.)

	C6. OTHER CONCRETE:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.**			

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 01-120957	**School Name:** Luther Burbank High School	**School District:** Sacramento City Unified School District
DSA File Number: 34-H7	**Increment Number:**	**Date Created:** 2023-02-08 16:54:04

	S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	**Periodic**	*	**Table 1705A.2.1 Item 3a–3c.** 2202A.1; AISI S100-20 Section A3.1 & A3.2, AISI S240-20 Section A3 & A5, AISI S220-20 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
☑	**b.** Test unidentified materials	**Test**	**LOR**	**2202A.1.**
☑	**c.** Examine seam welds of HSS shapes	**Periodic**	**SI**	DSA IR 17-3.
☑	**d.** Verify and document steel fabrication per DSA-approved construction documents.	**Periodic**	**SI**	Not applicable to cold-formed steel light-frame construction, except for trusses (**1705A.2.4**).
☐	**e.** Buckling restrained braces.	**Test**	**LOR**	Testing and special inspections in accordance with IR 22-4.

	S/A2. HIGH-STRENGTH BOLTS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	**Periodic**	**SI**	**Table 1705A.2.1 Items 1a & 1b, 2202A.1;** AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.
☐	**b.** Test high-strength bolts, nuts and washers.	**Test**	**LOR**	**Table 1705A.2.1 Item 1c, 2213A.1**; RCSC 2014 Section 7.2; DSA IR 17-8.
☐	**c.** Bearing-type ("snug tight") connections.	**Periodic**	**SI**	**Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2**; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
☐	**d.** Pretensioned and slip-critical connections.	*	**SI**	**Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2;** AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. *"Continuous" or "Periodic" depends on the tightening method used.

	S/A3. WELDING:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	**Periodic**	**SI**	**1705A.2.5, Table 1705A.2.1 Items 4 & 5**; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3.
☑	**b.** Verify weld filler material manufacturer's certificate of compliance.	**Periodic**	**SI**	DSA IR 17-3.
☑	**c.** Verify WPS, welder qualifications and equipment.	**Periodic**	**SI**	DSA IR 17-3.

	S/A4. SHOP WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☑	**a.** Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	**Continuous**	**SI**	**Table 1705A.2.1 Items 5a.1–4;** AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
☑	**b.** Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	**Periodic**	**SI**	**1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6;** AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.
☐	**c.** Inspect welding of stairs and railing systems.	**Periodic**	**SI**	**1705A.2.1**; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.
☐	**d.** Verification of reinforcing steel weldability other than ASTM A706.	**Periodic**	**SI**	**1705A.3.1**; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
☐	**e.** Inspect welding of reinforcing steel.	**Continuous**	**SI**	**Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8;** AWS D1.4; DSA IR 17-3.

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A5. FIELD WELDING (IN ADDITION TO SECTION S/A3):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	**Continuous**	**SI**	**Table 1705A.2.1 Items 5a.1–4;** AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
☐	**b.** Inspect single-pass fillet welds ≤ 5/16”.	**Periodic**	**SI**	**Table 1705A.2.1 Item 5a.5;** AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.
☐	**c.** Inspect end-welded studs (ASTM A-108) installation (including bend test).	**Periodic**	**SI**	**2213A.2**; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
☐	**d.** Inspect floor and roof deck welds.	**Periodic**	**SI**	**1705A.2.2, Table 1705A.2.1 Item 5a.6;** AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
☐	**e.** Inspect welding of structural cold-formed steel.	**Periodic**	**SI***	**1705A.2.5; AWS D1.3; DSA IR 17-3.** The quality control provisions of AISI S240-20 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
☐	**f.** Inspect welding of stairs and railing systems.	**Periodic**	**SI***	**1705A.2.1;** AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
☐	**g.** Verification of reinforcing steel weldability.	**Periodic**	**SI**	**1705A.3.1**; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
☐	**h.** Inspect welding of reinforcing steel.	**Continuous**	**SI**	**Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8;** AWS D1.4; DSA IR 17-3.

Application Number: 01-120957	**School Name:** Luther Burbank High School	**School District:** Sacramento City Unified School District
DSA File Number: 34-H7	**Increment Number:**	**Date Created:** 2023-02-08 16:54:04

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A6. NONDESTRUCTIVE TESTING:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Ultrasonic	**Test**	**LOR**	**1705A.2.1, 1705A.2.5;** AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
☐	**b.** Magnetic Particle	**Test**	**LOR**	**1705A.2.1, 1705A.2.5;** AISC 341-16 J6.2, AISC 360-16 N5.5; AWS D1.1, AWS D1.8; DSA IR 17-2.
☐	**c.**	**Test**	**LOR**	

	S/A7. STEEL JOISTS AND TRUSSES:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	**Continuous**	**SI**	**1705A.2.3, Table 1705A.2.3;** AWS D1.1; DSA IR 22-3 for steel joists only. **1705A.2.4;** AWS D1.3 for cold-formed steel trusses.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (STEEL AND ALUMNINUM), 2022 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-20; RCSC 2014; AWS D1.1, AWS D1.2, AWS D1.3, AWS D1.4, AWS D1.8

Application Number: 01-120957	**School Name:** Luther Burbank High School	**School District:** Sacramento City Unified School District
DSA File Number: 34-H7	**Increment Number:**	**Date Created:** 2023-02-08 16:54:04

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A8. SPRAYED FIRE-RESISTANT MATERIALS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	**Periodic**	**SI**	**1705A.15, 1705A.1, 1705A.2, 1705A.3, 1705A.4.**
☐	**b.** Test density.	**Test**	**LOR**	**1705A.15.1, 1705A.15.5, ASTM E736**
☐	**c.** Bond strength adhesion/cohesion.	**Test**	**LOR**	**1705A.15.1, 1705A.15.4, ASTM E605**

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A9. ANCHOR BOLTS AND ANCHOR RODS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Anchor Bolts and Anchor Rods	**Test**	**LOR**	Sample and test anchor bolts and anchor rods not readily identifiable per procedures noted in DSA IR 17-11.
☐	**b.** Threaded rod not used for foundation anchorage.	**Test**	**LOR**	Sample and test threaded rods not readily identifiable per procedures noted in DSA IR 17-11.

	Test or Special Inspection	Type	Performed By	Code References and Notes
	S/A10. STORAGE RACK SYSTEMS:			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents.	**Periodic**	**SI**	Table 1705A.13.7
☐	**b.** Fabricated storage rack elements.	**Periodic**	**SI**	1704A.2.5; Table 1705A.13.7

	Test or Special Inspection	Type	Performed By	Code References and Notes
☐	**c.** Storage rack anchorage installation.	**Periodic**	**SI**	ANSI/MH16.1 Section 7.3.2; Table 1705A.13.7
☐	**d.** Completed storage rack system to indicate compliance with the approved construction documents.	**Periodic**	**SI***	Table 1705A.13.7; * May be preformed by the project inspector when specifically approved by DSA.

	S/A11. Other Steel			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.**			

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number:	School Name:	School District:
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

Exempt items given in DSA IR A-22 or the 2019 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests **/** special inspections noted. **Items marked as exempt shall be identified on the approved construction documents**. The project inspector shall verify all construction complies with the approved construction documents.

	SOILS:
☐	1. Deep foundations acting as a cantilever footing with a design based on minimum allowable pressures per CBC Table 1806A.2 and without a geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
☐	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill.

	CONCRETE/MASONRY:
☐	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding" in the Appendix below) given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding" in the Appendix below
☐	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.
☐	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1. Refer to construction documents for specific exemptions accordingly for each applicable wall condition.
☐	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

Application Number:	**School Name:**	**School District:**
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

	CONCRETE/MASONRY:
☐	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	WELDING:
☐	1. Solid-clad and open-mesh fences, gates with maximum leaf span of 10', and gates with a maximum rolling section of 10' all having an apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates/fences are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
☐	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
☐	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
☐	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
☐	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections S/A3, S/A4 and/or S/A5 of listing above).
☐	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for sections S/A3, S/A4 and/or S/A5 located in the Steel/Aluminum category of listing above).
☐	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) ≤4' above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-22: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2022 CBC

Application Number:	**School Name:**	**School District:**
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

Name of Architect or Engineer in general responsible charge:

Jeff Grau

Name of Structural Engineer (When structural design has been delegated):

Greg Richards

Signature of Architect or Structural Engineer: Date:

February 8, 2023

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.

DSA STAMP

DSA 103-22: LIST OF REQUIRED VERIFIED REPORTS, CBC 2022

Application Number:	School Name:	School District:
01-120957	Luther Burbank High School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-H7		2023-02-08 16:54:04

1. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291
2. Concrete Batch Plant Inspection: Laboratory Verified Report Form DSA 291
3. Post-installed Anchors: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292
4. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

DOCUMENT 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 37 – GENERAL

37.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions;

C. Site Standards; and

D. Construction Waste Management and Disposal.

37.02 TEMPORARY UTILITIES:

A. Electric Power and Lighting:

(1) Contractor will pay for power during the course of the Work. To the extent power is available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building(s) or on the Site to point of intended use.

(2) Contractor shall verify characteristics of power available in building(s) or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.

(3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.

(4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.

B. Heat and Ventilation:

(1) Contractor shall provide temporary heat to maintain environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation and curing of materials, and to

protect materials and finishes from damage due to improper temperature and humidity conditions. Portable heaters shall be standard units complete with controls.

(2) Contractor shall provide forced ventilation and dehumidification, as required, of enclosed areas for proper installation and curing of materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors, and gases.

(3) Contractor shall pay the costs of installation, maintenance, operation, and removal of temporary heat and ventilation, including costs for fuel consumed, required for the performance of the Work.

C. Water:

(1) Contractor shall pay for water used during the course of the Work. Contractor shall coordinate and pay for installation or use of water meter in compliance with local water agency requirements. To the extent water is then available in the building(s) or on the Site, Contractor may use the District's existing utilities by making prearranged payments to the District for the utilities used by Contractor and all Subcontractors. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building(s), on the Site, or other location approved by the local water agency, to point of intended use.

(2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.

(3) Contractor shall make potable water available for human consumption.

D. Sanitary Facilities:

(1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.

(2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

E. Telephone Service:

(1) Contractor shall arrange with local telephone service company for telephone service as required for the performance of the Work. Contractor shall, at a minimum, provide in its field office one line for telephone and one line for fax machine.

(2) Contractor shall pay the costs for telephone and fax lines installation, maintenance, service, and removal.

F. Fire Protection:

(1) Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.

(2) Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

G. Trash Removal:

(1) Contractor shall provide trash removal on a timely basis**.** Under no circumstance shall Contractor use District trash service.

H. Field Office:

(1) If Contractor chooses to provide a field office, it shall be an acceptable construction trailer that is well-lit and ventilated. The construction trailer shall be equipped with shelves, desks, filing cabinet, chairs, and such other items of equipment needed. Trailer and equipment are the property of the Contractor and must be removed from the Site upon completion of the Work. Contractor may use area adjacent to the construction area for an office area, if approved in writing by District.

(2) Contractor shall provide any additional electric lighting and power required for the trailer. Contractor shall make adequate provisions for heating and cooling as required.

I. Temporary Facilities:

None

37.03 CONSTRUCTION AIDS:

A. Plant and Equipment:

(1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workers. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.

(2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.

B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

37.04 BARRIERS AND ENCLOSURES:

A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.

B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other buildings and portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.

C. Contractor shall provide site access to existing facilities for persons using other buildings and portions of the Site, the public, and for deliveries and other services and activities.

D. Tree and Plant Protection:

(1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.

(2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations, or as denoted on the Plans.

(3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.

(4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.

(5) Excavation around Trees:

(a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.

(b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and

larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.

(c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.

(d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.

(e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.

(f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

37.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

37.06 TEMPORARY CONTROLS:

A. Noise Control:

(1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.

(2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration:

(1) Equipment and impact tools shall have intake and exhaust mufflers.

(2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt:

(1) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.

(2) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.

(3) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.

(4) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water:

(1) Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution:

(1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.

(2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting:

(1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

37.07 JOB SIGN(S):

A. General:

(1) Contractor shall provide and maintain a Project identification sign with the design, text, and colors designated by the District and/or the Design Professional; locate sign as approved by the District.

(2) Signs other than the specified Project sign and or signs required by law, for safety, or for egress, shall not be permitted, unless otherwise approved in advance by the District.

B. Materials:

(1) Structure and Framing: Structurally sound, new or used wood or metal; wood shall be nominal 3/4-inch exterior grade plywood.

(2) Sign Surface: Minimum 3/4-inch exterior grade plywood.

(3) Rough Hardware: Galvanized.

(4) Paint: Exterior quality, of type and colors selected by the District and/or the Design Professional.

C. Fabrication:

(1) Contractor shall fabricate to provide smooth, even surface for painting.

(2) Size: 4'-0" x 8'-0", unless otherwise indicated.

(3) Contractor shall paint exposed surfaces of supports, framing, and surface material with exterior grade paint: one coat of primer and one coat of finish paint.

(4) Text and Graphics: As indicated.

37.08 PUBLICITY RELEASES:

A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s) without the written permission of the District.

PART 38 – PRODUCTS Not used.

PART 39 – EXECUTION Not used.

END OF DOCUMENT

DOCUMENT 01 50 13

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 40 - GENERAL

40.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions; and

C. Temporary Facilities and Controls.

40.02 SECTION INCLUDES:

A. Administrative and procedural requirements for the following:

(1) Salvaging non-hazardous construction waste.

(2) Recycling non-hazardous construction waste.

(3) Disposing of non-hazardous construction waste.

40.03 DEFINITIONS:

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

40.04 PERFORMANCE REQUIREMENTS:

A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of sixty-five percent (65%) by weight (or by volume, but not a combination) of total waste generated by the Work.

40.05 SUBMITTALS:

A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.

B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:

(1) Material category.

(2) Generation point of waste.

(3) Total quantity of waste in tons or cubic yards.

(4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.

(5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.

(6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.

(7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

F. 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.

G. 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.

H. CHPS Submittal: CHPS letter template for Credit ME2.0 and ME2.1, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.

I. Qualification Data: For Waste Management Coordinator.

J. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

K. Submittal procedures and quantities are specified in Document 01 33 00.

40.06 QUALITY ASSURANCE:

A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:

(1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.

(2) Review requirements for documenting quantities of each type of waste and its disposition.

(3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.

(4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.

(5) Review waste management requirements for each trade.

40.07 WASTE MANAGEMENT PLAN:

A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measurement throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

(1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

(2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.

(3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.

(4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.

(5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

(6) 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 41 - PRODUCTS Not Used.

PART 42 - EXECUTION

42.01 PLAN IMPLEMENTATION:

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

(1) Comply with Document 01 50 00 for operation, termination, and removal requirements.

B. **[**Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.**]**

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

(1) Distribute waste management plan to everyone concerned within 3 days of submittal return.

(2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

(1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

(2) Comply with Document 01 50 00 for controlling dust and dirt, environmental protection, and noise control.

42.02 RECYCLING CONSTRUCTION WASTE:

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 the 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 District property and transport to recycling receiver or processor.

D. Packaging:

(1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.

(2) Polystyrene Packaging: Separate and bag material.

(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.

E. Site-Clearing Wastes: Chip brush, branches, and trees on site.

F. 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.

G. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.

(1) Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

42.03 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 District property and legally dispose of them.

END OF DOCUMENT

SECTION 01 5013A

CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN

(Submit After Award of Contract and Prior to Start of Work)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ( )	Fax: ( )	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Project Period:	From:	TO:

Reuse, Recycling or Disposal Processes To Be Used

Describe the types of recycling processes or disposal activities that will be used for material generated in the project. Indicate the type of process or activity by number, types of materials, and estimated quantities that will be recycled or disposed in the sections below:

01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
06 - Recycling material as Alternative Daily Cover at landfills
07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
08 - Disposal at a landfill or transfer station.
09 - Other (please describe) _____

Types of Material To Be Generated

Use these codes to indicate the types of material that will be generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris		R = Reuse/Salvage	W = Wood	O = Other (describe)

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling will occur.

Type of Material	Type of Activity	Facility to be Used/Location	Total Truck Loads	Total Quantities Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, Los Angeles	24	355		
a. Total Diversion			0	0	0	0

SECTION 01 5013A

CONTRACTOR'S CONSTRUCTION WASTE AND RECYCLING PLAN

Continued

SECTION II - DISPOSED MATERIALS								
Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling will occur.								
Type of Material	Type of Activity	Facility to be Used/Location			Total Truck Loads	Total Quantities Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles			2	35		
b. Total Disposal						0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
This section calculates the total materials to be generated during the project period (Reuse/Recycle + Disposal = Generation						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION					
Add totals from Section I + Section II					
	Tons	Cubic Yards	Other Wt.		
a. Materials Re-Used and Recycled	0				
b. Materials Disposed	0				
c. Total Materials Generated (a. + b. = c.)	0	0	0		
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!				

** Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled*

Contractor's Comments (Provide any additional information pertinent to planned reuse, recycling, or disposal activities):

Notes:

1. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)

Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)

Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)

Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons)

Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons)

Drywall Scrap: .20

Wood Scrap: .16

SECTION 01 5013B

CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT

(Submit With Each Progress Payment)

Project Title:		
Contract or Work Order No.:		
Contractor's Name:		
Street Address:		
City:	State:	Zip:
Phone: ( )	Fax: ( )	
E-Mail Address:		
Prepared by: (Print Name)		

Date Submitted:		
Period Covered:	From:	To:

Reuse, Recycling or Disposal Processes Used

Describe the types of recycling processes or disposal activities used for material generated in the project. Indicate the type of process or activity by number, types of materials, and quantities that were recycled or disposed in the sections below:

01 - Reuse of building materials or salvage items on site (i.e. crushed base or red clay brick)
02 - Salvaging building materials or salvage items at an off site salvage or re-use center (i.e. lighting, fixtures)
03 - Recycling source separated materials on site (i.e. crushing asphalt/concrete for reuse or grinding for mulch)
04 - Recycling source separated materials at an off site recycling center (i.e. scrap metal or green matls)
05 - Recycling commingled loads of C&D matls at an off site mixed debris recycling center or transfer station
06 - Recycling material as Alternative Daily Cover at landfills
07 - Delivery of soils or mixed inerts to an inert landfill for disposal (inert fill).
08 - Disposal at a landfill or transfer station.
09 - Other (please describe) _____

Types of Material Generated

Use these codes to indicate the types of material that were generated on the project

A = Asphalt	C = Concrete	M = Metals	I = Mixed Inert	G = Green Matls
D = Drywall	P/C=Paper/Cardboard	W/C = Wire/Cable	S= Soils (Non Hazardous)	
M/C = Miscellaneous Construction Debris		R = Reuse/Salvage	W = Wood	O = Other (describe)

Facilities Used: Provide Name of Facility and Location (City)

Total Truck Loads: Provide Number of Trucks Hauled from Site During Reporting Period

Total Quantities: If scales are available at sites, report in tons. If not, quantify by cubic yards. For salvage/reuse items, quantify by estimated weight (or units).

SECTION I - RE-USED/RECYCLED MATERIALS

Include all recycling activities for source separated or mixed material recycling centers where recycling occurred.

Type of Material	Type of Activity	Facilities Used/Location			Total Truck Loads	Total Quantities Tons	Cubic YD	Other Wt.
(ex.) M	04	ABC Metals, Los Angeles			24	355		
a. Total Diversion					0	0	0	0

SECTION 01 5013B

CONTRACTOR'S REUSE, RECYCLING, AND DISPOSAL REPORT

Continued

SECTION II - DISPOSED MATERIALS								
Include all disposal activities for landfills, transfer stations, or inert landfills where no recycling occurred.								
Type of	Type	Facilities			Total Truck	Total Quantities		
Material	of Activity	Used/Location			Loads	Tons	Cubic YD	Other Wt.
(ex.) D	08	DEF Landfill, Los Angeles			2	35		
b. Total Disposal						0	0	0

SECTION III - TOTAL MATERIALS GENERATED						
This section calculates the total materials generated during the project period (Reuse/Recycle + Disposal = Generation						
				Tons	Cubic YD	Other Wt.
a. Total Reused/Recycled				0	0	0
b. Total Disposed				0	0	0
c. Total Generated				0	0	0

SECTION IV - CONTRACTOR'S LANDFILL DIVERSION RATE CALCULATION					
Add totals from Section I + Section II					
	Tons	Cubic Yards	Other Wt.		
a. Materials Re-Used and Recycled	0				
b. Materials Disposed	0				
c. Total Materials Generated (a. + b. = c.)	0	0	0		
d. Landfill Diversion Rate (Tons Only)*	#DIV/0!				

** Use tons only to calculate recycling percentages: Tons Reused/Recycled/Tons Generated = % Recycled*

Contractor's Comments (*Provide any additional information pertinent to planned reuse, recycling, or disposal activities*):

Notes:

1. Suggested Conversion Factors: From Cubic Yards to Tons (Use when scales are not available)

Asphalt: .61 (ex. 1000 CY Asphalt = 610 tons. Applies to broken chunks of asphalt)

Concrete: .93 (ex. 1000 CY Concrete = 930 tons. Applies to broken chunks of concrete)

Ferrous Metals: .22 (ex. 1000 CY Ferrous Metal = 220 tons) Drywall Scrap: .20

Non-Ferrous Metals: .10 (ex. 1000 CY Non-Ferrous Metals = 100 tons) Wood Scrap: .16

DOCUMENT 01 52 13

FIELD OFFICES

PART 43 – GENERAL

43.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions; and

C. Temporary Facilities and Controls.

43.02 SECTION INCLUDES:

A. Requirements for Field Offices and Field Office Trailers.

43.03 SUMMARY:

A. General: Contractor shall provide District's Field Office Trailer and contents, for District's use exclusively, during the term of the Contract.

B. Property: Trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor with the Office Trailer shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.

C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District.

D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.

E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

43.04 SUBMITTALS:

A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.

B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.

C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.

D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.

E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.

F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

43.05 QUALITY ASSURANCE

A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.

B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.

C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.

D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.

E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

43.06 REGULATORY REQUIREMENTS

A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactments, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.

B. California Building Standards Code ("CBSC").

C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").

D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 44 – PRODUCTS

44.01 FIELD OFFICE TRAILER

A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.

B. Manufacturers: General Electric Capital Modular Space; The Space Place, Inc.; or equal.

C. Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.

(1) Nominal Trailer Size: Four hundred eighty (480) square feet, minimum.

(2) Stairs, Platform: Properly finished stairs, platforms, and ramps.

(3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.

(4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like. There shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged or both, as directed by District.

(5) HVAC:

(6) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.

(7) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

(8) Telephones and Telephone Outlets: Two (2) telephone lines wired, connected to telephone utility service, and ready for use, and two (2) telephone instruments, each with two (2)-line capability, speed dial and hands-free feature. Locate each outlet as directed by District.

(9) Voicemail Messaging System or Answering Machine: One (1) unit, two (2)-line; digital.

44.02 FIELD OFFICE TRAILER ITEMS

A. General: Provide the Field Office Trailer with the following arranged into two (2) workstations:

(1) Desks: Two (2) desks: thirty-six (36) inches by sixty (60) inches; steel, laminated plastic top; locking, one (1) or two (2) file drawers single pedestal; steel; provide five (5) keys to District.

(2) Tables: Two (2) tables; thirty-six (36) inches by sixty (60) inches; twenty-nine (29) inches high; steel, laminated plastic top tables; one (1) at each desk.

(3) Chairs: Two (2) chairs: swivel; steel; with seat cushion and arms; one (1) at each desk.

(4) Waste Baskets: Two (2) waste baskets, one at each desk.

B. Furniture and Equipment: Provide in the space located to effect efficient and logical use.

(1) File cabinet: One (1); four (4) drawer; lateral; steel locking.

(2) Plan Table: One (1) plan table: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawers.

(3) Drafting Stool: One (1) drafting stool; swiveling; steel; padded; adjustable; with footrest and casters.

(4) Bookshelf: One (1) bookshelf: thirty-six (36) inches deep by seventy-two (72) inches wide by forty-two (42) inches high; adjustable; wood or steel; with lockable plan and pencil drawer.

(5) Plan Rack: One (1) wheel mounted plan rack.

(6) Waste Baskets: One (1) large waste basket.

(7) Coat/Hat Hanger: Wall mounted with minimum capacity for four (4) garments and ten (10) hats.

(8) Document Management System: Shall include an integrated high-volume printer, copier, and facsimile machine, including stand, base, and storage cabinet; and shall include the following features:

(a) Type: Laser, dry electrostatic transfer, plain paper, digital, multi-function imaging system.

(b) Network: Ethernet or Token Ring network ready, Plug-and-Play.

(c) Print, send/receive facsimile from any connected workstation.

(d) Resolution: Six hundred (600) dots per inch by six hundred (600) dots per inch, minimum.

(e) Print Speed: Twenty (20) pages per minute, minimum.

(f) Copies: Twenty (20) copies per minute, minimum.

(g) Document Handler: Forty (40) sheet, minimum

(h) Collator: Forty (40) bin, minimum, with stapling.

(i) Duplexing: Capable.

(j) Paper Size: Capable of handling paper sizes to eleven (11) inches by seventeen (17) inches.

(k) Paper Cassettes: One (1) each for eight and one half (8.5) inches by eleven (11) inches, eight and one half (8.5) inches by fourteen (14) inches, and eleven (11) inches by seventeen (17) inches paper sizes; minimum two hundred fifty (250) sheets per cassette.

(l) Reduction/Enlargement: Capable of reduction to twenty-five percent (25%) and enlargement to two hundred percent (200%).

(m) Facsimile Electronic Storage: Capable of storing minimum of fifty (50) speed dial numbers, group faxing and broadcast faxing.

(n) Facsimile Scanning: Capable of scanning into memory a minimum of one hundred (100) pages with maximum scan time of three (3) seconds per page.

(o) Halftone: Sixty-four (64) levels.

(p) Redial: Automatic and Manual.

(9) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:

(a) Unlimited Service Calls.

(b) Same Day Response.

(c) All parts, labor, preventative maintenance and mileage.

(d) All chemicals, such as toner, fixing agent, and the like.

(e) System training and setup.

(10) Portable Toilets: Two (2); each shall include a urinal; each unit shall be a properly enclosed chemical unit conforming to ANSI Z4.3.

(a) Location: As directed by District.

(b) Maintenance: Maintain each unit and surrounding areas in a clean, hygienic and orderly manner, at all time. Empty, clean, and sanitize each unit each day at a location and time as directed by District.

(c) Removal: Relocate, or remove from the site, each Portable Toilet. Upon such directive by District, the Contractor shall forthwith relocate or remove each Portable Toilet and submit the affected areas to a condition which existed prior to the installation of each Portable Toilet, within three (3) calendar days, or as directed by District in writing, at no cost to District.

44.03 UTILITY AND SERVICES

A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.

B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

44.04 FINISHES

A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.

B. Finish: Color as selected by District from manufacturer standard palette.

PART 45 – EXECUTION

45.01 INSTALLATION

A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.

B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.

C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.

D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.

E. Location: As directed by District.

F. Fire Resistance: Construct and install in accordance with UL requirements.

G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.

H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.

(1) Frequency: Two (2) times per week, minimum.

I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: VOC restrictions for product categories listed below under Article "DEFINITIONS" and in compliance with the following.

1. California Code of Regulations, Title 24, Part 11 California Green Building Standards Code.

B. Products of each category that are installed in the project must comply; applicable laws and ordinances do not allow for partial compliance.

C. Listing of a product in these Specifications shall not be construed as a solicitation or requirement to use any product or combination of products in violation of the requirements of South Coast Air Quality Management District Rule No.1168, as described in Rule 1168(g).

1. If a listed product does not meet the requirements of this rule, request approval for use of an alternate product by the same or another manufacturer meeting the requirements of this rule.
2. Do not use products which do not meet the requirements of this rule.

1.2 RELATED REQUIREMENTS

A. Divisions 01 through 33 contain related requirements specific to the work of each of these Sections. Requirements may or may not include reference to this Section.

B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.3 REFERENCES

A. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.

C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; current edition.

D. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

E. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.

F. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

G. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scscertified.com.

1.4 DEFINITIONS

A. VOC-Restricted Products: Products of each of the following categories when installed or applied on-site:

1. Adhesives, sealants, and sealer coatings, regardless of specification Section or Division.
2. Paints and coatings.
3. Carpet and resilient flooring.
4. Composite wood products; plywood, particleboard, wood fiberboard.

B. Adhesives: Gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

C. Sealants: Gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.5 SUBMITTAL REQUIREMENTS

A. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.

B. Verification of Compliance: Submit for each different product in each applicable category.

1. Identify evidence submittals with the words "CALGreen VOC Compliance Report".

C. Installer Certifications for Accessory Materials:

1. Require each installer of any type of product, not just the products for which VOC restrictions are specified, to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of their products, or 2) that such products used comply with these requirements.
2. Use the form following at the end of Part 3 in this Section for Installer certifications.

1.6 QUALITY ASSURANCE

A. Manufacturer’s Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Provide products conforming to local, State and Federal government requirements limiting the amount of volatile organic compounds contained in the product, for its intended application. If specified product exceeds current requirement, provide conforming product at no additional cost.
2. Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168 and less where required by code.
3. Products are specified in multiple Sections throughout these Specifications.

B. Adhesives, Including Carpet and Cushion Adhesives: Comply with CALGreen Section 5.504 and Table 5.504.4.1.

1. Verification of Compliance: Acceptable types are:
    a. Report of laboratory testing performed in accordance with requirements.
    b. Published product data showing compliance with requirements.
    c. Certification by manufacturer that product complies with requirements.
2. Aerosol Adhesives: Comply with Table 5.504.4.1 of CalGreen Section 5.504, and California Code of Regulations Title 17, Section 94507.
    a. Verification of Compliance: Acceptable types are:
        1) Current GreenSeal Certification.
        2) Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
        3) Published product data showing compliance with requirements.

3. Products used shall comply with the following limits.

Table 5.504.4.1 ADHESIVE VOC LIMIT	
Architectural Applications	**Current VOC Limit**
Indoor Carpet Adhesives	50
Carpet Pad Adhesives	50
Outdoor Carpet Adhesives	150
Wood Flooring Adhesive	100
Rubber Floor Adhesives	60
Subfloor Adhesives	50
Ceramic Tile Adhesives	65
VCT and Asphalt Tile Adhesives	50
Dry Wall and Panel Adhesives	50
Cove Base Adhesives	50
Multipurpose Construction Adhesives	70
Structural Glazing Adhesives	100
Single Ply Roof Membrane Adhesives	250
Other adhesives not specifically listed	250
VOC Limits and Effective Dates**	
Specialty Applications	**Current VOC Limit**
PVC Welding	510

Table 5.504.4.1 ADHESIVE VOC LIMIT	
CPVC Welding	490
ABS Welding	325
Plastic Cement Welding	250
Adhesive Primer for Plastic	550
Contact Adhesive	80
Special Purpose Contact Adhesive	250
Structural Wood Member Adhesive	140
Top and Trim Adhesive	250
** The specified limits remain in effect unless revised limits are listed in the current governing edition of CalGreen.	
For adhesives, adhesive bonding primers, or any other primer not regulated by the above two Tables and applied to the following substrates, the following limits shall apply:	
Substrate Specific Applications	**Current VOC Limit**
Metal to Metal	30
Plastic Foams	50
Porous Material (except wood)	50
Wood	30
Fiberglass 80	80
Note: If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.	

C. Joint Sealants: Comply with CALGreen Section 5.504 and Table 5.504.4.2.

1. Verification of Compliance: Acceptable types are:
    a. Report of laboratory testing performed in accordance with requirements.
    b. Published product data showing compliance with requirements.
    c. Certification by manufacturer that product complies with requirements.

2. Products used shall comply with the following limits.

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Sealant	Current VOC Limit
Architectural	250
Marine Deck	760
Non-Membrane Roof	300
Roadway	250
Single-Ply Roof Membrane	450
Other	420
Sealant Primers	Current VOC Limit
Architectural Non-Porous	250

Table 5.504.4.2 SEALANT VOC LIMIT	
Less Water and Less Exempt Compounds in Grams per Liter	
Porous	775
Modified Bituminous	500
Marine Deck	760
Other	750
For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material; for all other adhesives and sealants, VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds.	

D. Resilient Flooring Products: Comply with CALGreen 5.504.4.6.

1. Eighty percent of floor area receiving resilient flooring shall meet one of the following:
   a. Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.
   b. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health's 2010 Standard Method for the Testing and Evaluation Chambers, Version 1.1, February 2010;
   c. Complying with VOC emission limits in CHPS 2009 criteria and listed on the Low Emitting Materials List or Product Registry.
   d. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children's & Schools Program).
2. Verification of Compliance:
   a. Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.

E. Paints and Coatings: Comply with CALGreen Section 5.504 and Table 5.504.4.3 based on the California Air Resources Board, Architectural Coatings Suggested Control Measure.

1. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at Project site; or other method acceptable to authorities having jurisdiction.
   a. Verification of Compliance: Acceptable types are:
      1) Report of laboratory testing performed in accordance with requirements.
      2) Published product data showing compliance with requirements.
      3) Certification by manufacturer that product complies with requirements.
2. Provide coatings that comply with the most stringent requirements specified in the following:
   a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   b. South Coast Air Quality Management District Rule No.1168.

3. Products used shall comply with the following limits.

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	**Current VOC Limit 1/1/2012**
Flat Coatings	50
Non-Flat Coatings	100
Non-Flat High Gloss Coatings	150
Specialty Coatings	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete / Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings (See Note 1 below)	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multicolor Coatings	250
Pretreatment Wash Primers	420
Primers, Sealers and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs: Clear Opaque	 730 550
Specialty Primers, Sealers and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100

Table 5.504.4.3 VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS (See Notes 2 & 3 below)	
Grams of VOC per Liter of Coating, less water and less exempt compounds	
Coating Category	**Current VOC Limit 1/1/2012**
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc Rich Primers	340
Note 1: Grams of VOC per liter of coating including water and including exempt compounds	
Note 2: Not Applicable	
Note 3: Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008. More information is available from the Air Resources Board.	

4. Restricted Components: In addition to the specified VOC limits, paints and coatings shall not contain any of the following:
   a. Acrolein.
   b. Acrylonitrile.
   c. Antimony.
   d. Benzene.
   e. Butyl benzyl phthalate.
   f. Cadmium.
   g. Di (2-ethylhexyl) phthalate.
   h. Di-n-butyl phthalate.
   i. Di-n-octyl phthalate.
   j. 1,2-dichlorobenzene.
   k. Diethyl phthalate.
   l. Dimethyl phthalate.
   m. Ethylbenzene.
   n. Formaldehyde.
   o. Hexavalent chromium.
   p. Isophorone.
   q. Lead.
   r. Mercury.
   s. Methyl ethyl ketone.
   t. Methyl isobutyl ketone.
   u. Methylene chloride.
   v. Naphthalene.
   w. Toluene (methylbenzene).

x. 1,1,1-trichloroethane.

y. Vinyl chloride.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. Additional costs to restore indoor air quality, including fines by authorities, due to installation of non-compliant products shall be borne by Contractor.

3.2 CERTIFICATION FORM

A. Use of this Form:

1. Because installers are allowed and directed to choose accessory materials suitable for the applicable installation, there is a possibility that such accessory materials might contain VOC content in excess of that permitted, especially where such materials have not been explicitly specified.
2. Contractor is required to obtain and submit this Form from each installer of work on this project.
3. For each product category listed, circle the correct words in brackets: either [HAS] or [HAS NOT].
4. If these accessory materials have been used, attach to this form product data and MSDS sheet for each such product.

(The Remainder of this Page is Intentionally Left Blank)

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

IDENTIFICATION:

Project Name: _____

Project No.: _____

Architect: _____

PRODUCT CERTIFICATION: I certify that the installation work of my firm on this project:

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

Product data and MSDS sheets are attached.

CERTIFIED BY (Installer/Manufacturer/Supplier Firm):

Firm Name: _____

Print Name: _____

Signature: _____

Title: _____ (officer of company)

Date: _____

END OF SECTION

s:\master specifications\division 01 - general requirements\01 6116.10_volatile organic compound (voc) restrictions.docx
Last Updated: January 18, 2022

DOCUMENT 01 64 00

OWNER-FURNISHED PRODUCTS

PART 46 – GENERAL

46.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions;

B. Special Conditions; and

C. Materials and Equipment.

46.02 SECTION INCLUDES

A. Requirements for the following:

(1) Installing Owner-furnished materials and equipment.

(2) Providing necessary utilities, connections and rough-ins.

46.03 DEFINITIONS

A. Owner: District, who is providing/furnishing materials and equipment.

B. Installing Contactor: Contractor, who is installing the materials and equipment furnished by the Owner.

46.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Receive, store and handle products in accordance with the manufacturer's instructions.

B. Protect equipment items as required to prevent damage during storage and construction.

PART 47 – PRODUCTS

47.01 GENERAL PRODUCT REQUIREMENTS

A. Installing Contractor's Responsibilities:

(1) Verify mounting and utility requirements for Owner-furnished materials and equipment items.

(2) Provide mounting and utility rough in for all items where required.

(a) Rough in locations, sizes, capacities, and similar type items shall be as indicated and required by product manufacturer.

B. Owner and Installing Contractor(s) Responsibilities:

(1) Owner-Furnished/Contractor Installed ("OFCI"): Furnished by the Owner; installed by the Installing Contractor.

(a) General: Owner and Installing Contractor(s) will coordinate deliveries of materials and equipment to coincide with the construction schedule.

(b) Owner will furnish specified materials and equipment delivered to the site. Owner/vendor's representative shall be present on Site at the time of delivery to comply with the contract requirements and Specifications Section 01 43 00, Materials and Equipment, Article 1.04.

(c) The Owner furnishing specified materials and equipment is responsible to provide manufacturer guarantees as required by the Contract to the Installing Contractor.

(d) The Installing Contractor shall:

1) Review, verify and accept the approved manufacturer's submittal/Shop Drawings for all materials and equipment required to be installed by the Installer Contractor and furnished by the Owner. Any discrepancies, including but not limited to possible space conflicts, should be brought to the attention of the Project Manager and/or Program Manager, if applicable.

2) Coordinate timely delivery. Installing Contractor shall receive materials and equipment at Site when delivered and give written receipt at time of delivery, noting visible defects or omissions; if such declaration is not given, the Installing Contractor shall assume responsibility for such defects and omissions.

3) Store materials and equipment until ready for installation and protect from loss and damage. Installing Contractor is responsible for providing adequate storage space.

4) Coordinate with other bid package contractors and field measurement to ensure complete installation.

5) Uncrate, assemble, and set in place.

6) Provide adequate supports.

7) Install materials and equipment in accordance with manufacturer's recommendations, instructions, and

Shop Drawings, supply labor and material required, and make mechanical, plumbing, and electrical connections required to operate equipment.

8) Be certified by equipment manufacturer for installation of the specific equipment supplied by the Owner.

9) Provide anchorage and/or bracing as required for seismic restraint per Title 24, UBC Standard 27-11 and all other applicable codes.

10) Provide the contract-required warranty and guarantee for all work, materials and equipment, and installation upon its completion and acceptance by the District. Guarantee includes all costs associated with the removal, shipping to and from the Site, and re-installation of any equipment found to be defective.

C. Compatibility with Space and Service Requirements:

(1) Equipment items shall be compatible with space limitations indicated and as shown on the Contract Documents and specified in other sections of the Specifications.

(2) Modifications to equipment items required to conform to space limitations specified for rough in shall not cause additional cost to the District.

D. Manufacturer's printed descriptions, specifications, and instructions shall govern the Work unless specifically indicated or specified otherwise.

47.02 FURNISHED MATERIALS AND EQUIPMENT

A. All furnished materials and equipment are indicated or scheduled on the Contract Documents.

PART 48 – EXECUTION

48.01 INSTALLATION

A. Install equipment items in accordance with the manufacturer's instructions.

B. Set equipment items securely in place, rigidly or flexibly mounted in accordance with manufacturers' directions.

C. Make electrical and mechanical connections as indicated and required.

D. Touch-up and restore damaged or defaced finishes to the Owner's satisfaction.

48.02 CLEANING AND PROTECTION

A. Repair or replace items not acceptable to the Architect or Owner.

B. Upon completion of installation, clean equipment items in accordance with manufacturer's recommendations, and protect from damage until final acceptance of the Work by the Owner.

END OF DOCUMENT

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 49 - GENERAL

49.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;

B. Special Conditions.

49.02 PRODUCTS

A. Products are as defined in the General Conditions.

B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.

C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

49.03 TRANSPORTATION AND HANDLING

A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.

B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.

C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

49.04 STORAGE AND PROTECTION

A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.

B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.

C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.

E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.

F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 50 – PRODUCTS Not Used.

PART 51 - EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 71 23

FIELD ENGINEERING

PART 52 - GENERAL

52.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Site Investigation, and Soils Investigation Report;

B. Special Conditions;

C. Site-Visit Certification.

52.02 REQUIREMENTS INCLUDED:

A. Contractor shall provide and pay for field engineering services by a California-registered engineer, required for the project, including, without limitations:

(1) Survey work required in execution of the Project.

(2) Civil or other professional engineering services specified, or required to execute Contractor's construction methods.

52.03 QUALIFICATIONS OF SURVEYOR OR ENGINEERS:

Contractor shall only use a qualified licensed engineer or registered land surveyor, to whom District makes no objection.

52.04 SURVEY REFERENCE POINTS:

A. Existing basic horizontal and vertical control points for the Project are those designated on the Drawings.

B. Contractor shall locate and protect control points prior to starting Site Work and preserve all permanent reference points during construction. In addition Contractor shall:

(1) Make no changes or relocation without prior written notice to District and Architect.

(2) Report to District and Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

(3) Require surveyor to replace Project control points based on original survey control that may be lost or destroyed.

52.05 RECORDS:

Contractor shall maintain a complete, accurate log of all control and survey work as it progresses.

52.06 SUBMITTALS:

A. Contractor shall submit name and address of Surveyor and Professional Engineer to District and Architect prior to its/their work on the Project.

B. On request of District and Architect, Contractor shall submit documentation to verify accuracy of field engineering work, at no additional cost to the District.

C. Contractor shall submit a certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance or nonconformance with Contract Documents.

PART 53 – PRODUCTS Not Used.

PART 54 - EXECUTION

54.01 COMPLIANCE WITH LAWS:

Contractor is responsible for meeting all applicable codes, OSHA, safety and shoring requirements.

54.02 NONCONFORMING WORK:

Contractor is responsible for any re-surveying required by correction of nonconforming work.

END OF DOCUMENT

DOCUMENT 01 73 29

CUTTING AND PATCHING

PART 55 – GENERAL

55.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;

B. Special Conditions;

C. Hazardous Materials Procedures and Requirements;

D. Hazardous Materials Certification;

E. Lead-Based Paint Certification;

F. Imported Materials Certification.

55.02 CUTTING AND PATCHING:

A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:

(1) Make several parts fit together properly.

(2) Uncover portions of Work to provide for installation of ill-timed Work.

(3) Remove and replace defective Work.

(4) Remove and replace Work not conforming to requirements of Contract Documents.

(5) Remove Samples of installed Work as specified for testing.

(6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.

(7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.

B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.

C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

55.03 SUBMITTALS:

A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:

(1) The work of the District or other trades.

(2) Structural value or integrity of any element of Project.

(3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.

(4) Efficiency, operational life, maintenance or safety of operational elements.

(5) Visual qualities of sight-exposed elements.

B. Contractor's Request shall also include:

(1) Identification of Project.

(2) Description of affected Work.

(3) Necessity for cutting, alteration, or excavations.

(4) Effects of Work on District, other trades, or structural or weatherproof integrity of Project.

(5) Description of proposed Work:

(a) Scope of cutting, patching, alteration, or excavation.

(b) Trades that will execute Work.

(c) Products proposed to be used.

(d) Extent of refinishing to be done.

(6) Alternates to cutting and patching.

(7) Cost proposal, when applicable.

(8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.

(9) Written permission of District or other District contractor(s) whose work will be affected.

55.04 QUALITY ASSURANCE:

A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.

B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

55.05 PAYMENT FOR COSTS:

A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.

B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 56 - PRODUCTS

56.01 MATERIALS:

A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.

B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 57 – EXECUTION

57.01 INSPECTION:

A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

57.02 PREPARATION:

A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.

B. Contractor shall provide devices and methods to protect other portions of Project from damage.

C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

57.03 ERECTION, INSTALLATION AND APPLICATION:

A. With respect to performance, Contractor shall:

(1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.

(2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.

(3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.

B. Contractor shall employ original installer or fabricator to perform cutting and patching for:

(1) Weather-exposed surfaces and moisture-resistant elements such as roofing, sheet metal, sealants, waterproofing, and other trades.

(2) Sight-exposed finished surfaces.

C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.

D. Contractor shall fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.

E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with

requirements of the Contract Documents and as required to match surrounding areas and surfaces.

F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

DOCUMENT 01 76 00

ALTERATION PROJECT PROCEDURES

PART 58 – GENERAL

58.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;

B. Special Conditions.

PART 59 - PRODUCTS

59.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.

B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 60 - EXECUTION

60.01 EXAMINATION:

A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.

B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

60.02 PREPARATION:

A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.

B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.

D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.

E. Contractor shall close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity. Contractor shall insulate ductwork and piping to prevent condensation in exposed areas. Contractor shall insulate building cavities for thermal and/or acoustical protection, as detailed.

60.03 INSTALLATION:

A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.

B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, mechanical work and electrical work.

C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.

D. Contractor shall refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat and square or straight transition to adjacent finishes.

E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

60.04 TRANSITIONS:

A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.

B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

60.05 ADJUSTMENTS:

A. Where removal of partitions or walls results in adjacent spaces becoming one, Contractor shall rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.

B. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.

C. Contractor shall trim and seal existing wood doors and shall trim and paint metal doors as necessary to clear new floor finish and refinish trim as required.

D. Contractor shall fit Work at penetrations of surfaces.

60.06 REPAIR OF DAMAGED SURFACES:

A. Contractor shall patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections, in the area where the Work is performed.

B. Contractor shall repair substrate prior to patching finish.

60.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.

B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.

C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified in the Contract Documents, including without limitation, the Drawings.

60.08 FINISHES:

A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.

B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

60.09 CLEANING:

A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

DOCUMENT 01 77 00

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 61 - GENERAL

61.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Completion of Work;

B. Special Conditions;

C. Temporary Facilities and Controls.

61.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

61.03 FINAL CLEANING

A. Contractor shall execute final cleaning prior to final inspection.

B. Contractor shall clean interior and exterior glass and all surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.

C. Contractor shall clean equipment and fixtures to a sanitary condition.

D. Contractor shall replace filters of operating equipment.

E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.

F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.

G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site and surrounding areas.

61.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

61.05 RECORD DOCUMENTS AND SHOP DRAWINGS

A. Contractor shall legibly mark each item to record actual construction, including:

(1) Measured depths of foundation in relation to finish floor datum.

(2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.

(3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.

(4) Field changes of dimension and detail.

(5) Details not on original Contract Drawings

(6) Changes made by modification(s).

(7) References to related Shop Drawings and modifications.

B. Contractor will provide one set of Record Drawings to District.

C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

61.06 INSTRUCTION OF DISTRICT PERSONNEL

A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months or by the change of season.

C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when the need for such data becomes apparent during instruction.

E. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

61.07 SPARE PARTS AND MAINTENANCE MATERIALS

A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

B. Contractor shall provide District with all required Operation and Maintenance Data at one time. Partial or piecemeal submissions of Operation and Maintenance Data will not be accepted.

PART 62 – PRODUCTS Not Used.

PART 63 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 78 23

OPERATION AND MAINTENANCE DATA

PART 64 – GENERAL

64.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Completion of the Work;

B. Special Conditions.

64.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

64.03 FORMAT:

A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").

B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.

C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.

D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.

E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.

G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

64.04 CONTENTS, EACH VOLUME:

A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants, Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.

C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.

E. Text: Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

F. Warranties and Bonds: Contractor shall bind in one copy of each.

64.05 MANUAL FOR MATERIALS AND FINISHES:

A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.

D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.

E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

64.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.

B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.

C. Contractor shall include color coded wiring diagrams as installed.

D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.

E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.

G. Contractor shall include manufacturer's printed operation and maintenance instructions.

H. Contractor shall include sequence of operation by controls manufacturer.

I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

J. Contractor shall provide control diagrams by controls manufacturer as installed.

K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.

L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).

O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

64.07 SUBMITTAL:

A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor’s start of Work.

B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.

C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.

D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 65 – PRODUCTS Not Used.

PART 66 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 78 36

WARRANTIES

PART 67 - GENERAL

67.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Warranty/Guarantee Information;

B. Special Conditions.

67.02 FORMAT

A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.

B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.

C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier; and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.

D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

67.03 PREPARATION:

A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty blank until the date of completion is determined.

B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.

C. Contractor shall co-execute submittals when required.

D. Contractor shall retain warranties until time specified for submittal.

67.04 TIME OF SUBMITTALS:

A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.

B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.

C. For items of work delayed beyond date of completion, Contractor shall provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as start of warranty period.

PART 68 - PRODUCTS Not Used.

PART 69 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 78 39

RECORD DOCUMENTS

PART 70 - GENERAL

70.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Documents on Work;

B. Special Conditions.

PART 71 - RECORD DRAWINGS

71.01 GENERAL:

A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible, full size original Contract Drawings (mylars).

B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each month. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Builts") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Builts shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blueline prints.

C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.

D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.

E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

71.02 RECORD DRAWING INFORMATION:

A. Contractor shall record the following information:

(1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

(2) Actual numbering of each electrical circuit to match panel schedule.

(3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.

(4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.

(5) Installed location of all cathodic protection anodes.

(6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.

(7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.

(8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

B. Contractor shall provide additional drawings as necessary for clarification.

C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."

D. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide electronic copies of the drawings (in PDF format) with one file with all of the sheets and one set of individual sheet files at the conclusion of the Project.

PART 72 - RECORD SPECIFICATIONS

72.01 GENERAL:

A. Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.

B. After review and approval of the marked-up specifications by the Project Inspector, Contractor shall provide one electronic copy of the specifications (in PDF format) at the conclusion of the Project.

PART 73 - MAINTENANCE OF RECORD DOCUMENTS

73.01 GENERAL

A. Contractor shall store Record Documents apart from documents used for construction as follows:

(1) Provide files and racks for storage of Record Documents.

(2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Contractor shall not use Record Documents for construction purposes.

PART 74 – PRODUCTS Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general requirements and procedures for compliance with California Code of Regulations, Title 24, Part 11 California Green Building Standards Code, "CAL-Green".

1. Chapter 5- Non-Residential Mandatory Measures.

1.2 RELATED REQUIREMENTS

A. Pertinent sections specifying erosion control.

B. Section 01 3543, Environmental Procedures.

C. Section 01 6116, Volatile Organic Compound (VOC) Restrictions.

D. Section 01 7419, Construction Waste Management and Disposal.

E. Section 01 7700, Closeout Procedures.

1.3 DEFINITIONS

A. CAL-Green Definitions: Certain terms are defined by CAL-Green in Chapter 5 of the code. Words and terms used in this section shall have the meanings shown therein.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Respond to questions and requests from Architect and the jurisdiction having authority regarding CAL-Green credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures. Document responses as informational submittals.

1.5 SUBMITTALS

A. CAL-GREEN Submittals: Submit CAL-GREEN submittals required by code and in other Specification Sections.

1. CAL-GREEN submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated CAL-GREEN requirements.
2. Acceptable verification submittals are specified in the related sections.

PART 2 - PRODUCTS

2.1 REQUIREMENTS - GENERAL

A. Provide products and procedures necessary to confirm CAL-GREEN compliance required in this Section. Although other Sections may specify some CAL-GREEN requirements, the Contractor shall determine additional materials, techniques, means, methods and procedures necessary to comply with CAL-GREEN requirements.

2.2 STORM WATER POLLUTION PREVENTION PLAN

A. Section 5.106.1: Comply with requirements of this code section, local ordinances, General Conditions, Special Provisions, and related sections specifying erosion control.

2.3 OUTDOOR WATER USE

A. Section 5.304.3.1: Irrigation Controllers: Comply with requirements of this code section, local ordinances and Section 32 8000.

2.4 CONSTRUCTION WASTE REDUCTION

A. Section 5.408 Construction Waste Management, Diversion and Recycling: Comply with requirements of this code section, local ordinances and Section 01 7419.

2.5 BUILDING MAINTENANCE AND OPERATION

A. Section 5.410.2.5. Documentation and Training: Provide Operations Training as required by these code sections and as specified in Section 01 7700 and Systems Manual as specified in Section 01 7700.

2.6 POLLUTANT CONTROL

A. Section 5.504.3 Indoor Air Quality: Comply with requirements of this code section, local ordinances and Section 01 3543.

1. During storage, rough installation and until final start-up of HVAC equipment, securely cover all ducts and air distribution component openings with plastic, tape, sheet metal or other methods acceptable to enforcing agency to reduce dust or debris collected in the system.

B. Section 5.504.4 Finish Material Pollutant Control: All Finish materials shall comply with requirements of this code section, local ordinances and Section 01 6116.

PART 3 - EXECUTION

3.1 GENERAL

A. Comply with Section 01 7419, Construction Waste Management and Disposal.

B. Comply with execution requirements of related sections and applicable local codes and ordinances.

END OF SECTION

DOCUMENT 01 91 00

COMMISSIONING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;

B. Special Conditions.

C. Submittal Procedures: Procedures for submittal of product data and quality assurance submittals.

D. Closeout Procedures: General closeout requirements.

E. Sustainable Design Closeout Documentation: Closeout requirements relating to sustainable design certification.

F. Appropriate Sections of Divisions 15 and 16 specify closeout and/or commissioning related requirements for specific pieces of equipment or building operating systems.

1.02 SECTION INCLUDES

A. Equipment and system commissioning, including the following:

(1) Completion of commissioning procedures on specific equipment and systems as indicated under "Related Documents and Provisions" above.

(2) Verification of operational and functional performance of specific equipment and systems for compliance with the "Design Intent" as described in the "Related Documents and Provisions" indicated above.

1.03 REFERENCES

A. None

1.04 DEFINITIONS

A. Commissioning: The process of verifying that the installation and performance of selected building systems meet or exceed the specified design criteria and therefore satisfy the design intent.

B. Deficiencies and Resolutions List: List of noted deficiencies discovered as result of commissioning process.

C. Final Commissioning Report: Overall final commissioning document, prepared by the Systems Commissioning Authority, which details the actual commissioning procedures performed, inspection and testing results, and the final version of the deficiencies and resolutions list indicating that all issues discovered through the commissioning process have been verified as resolved.

D. Functional Performance Testing Process: Documented testing of system parameters, under actual or simulated operating conditions.

E. Pre-Commissioning Checklists: Installation and start-up items to be completed by the appropriate party prior to operational verification through functional testing.

F. Physical Inspection Process: On-site inspection and review of related system components for conformance to the specifications.

G. Systems Commissioning Authority (SCA): Independent entity under contract directly with the District or District's Representative responsible for performing the specified commissioning procedures.

1.05 DESCRIPTION OF CONSTRUCTION PHASE COMMISSIONING PROCESS

A. As soon as practicable after the [bid award] [start of construction] the Systems Commissioning Authority (SCA) will conduct a pre-installation commissioning "kick-off" meeting with the contractors. Parties directly affected by the commissioning work will be required to attend. The SCA will explain the commissioning process in detail, and identify specific commissioning related responsibilities of the various parties.

B. Commissioning status meetings will be scheduled to occur during construction to monitor progress and to help facilitate the commissioning process. Contractor representatives will be required to attend these meetings.

C. Once contractors have provided the SCA with written verification indicating completion of installation and startup procedures, the SCA will conduct an on-site physical inspection of the specific systems and equipment.

D. Upon confirmation of system readiness, the SCA will schedule with the contractors to perform functional compliance with the project specifications and drawings. The SCA will oversee the process and will provide the format and documentation for these tests.

E. Deficiencies noted during these tests will be documented on the Deficiencies and Resolutions list. When corrected, issues will be resolved at the time of discovery. The responsible Contractor will resolve all other issues at a later date. All deficiencies will be noted by the SCA as either resolved or pending resolution.

F. The construction commissioning process will be complete when all noted deficiencies have been corrected, proved to be compliance with the project specifications or otherwise resolved to the satisfaction of the District.

1.06 SYSTEMS COMMISSIONING AUTHORITY'S DUTIES AND RESPONSIBILITIES

A. Meet and communicate with the District's representatives, Construction Manager, if any, Contractors, equipment manufacturers' representatives, Architect, Engineer and others as needed, to facilitate the commissioning process.

B. Review commissioning related specifications, submittals and construction documents. Communicate noted deficiencies and concerns to the District, Architect and Engineer.

C. Develop detailed and specific functional testing procedures for equipment and systems to be commissioned.

D. Develop testing, adjusting and balancing (TAB) specifications. Oversee the TAB process.

E. Perform site inspections and verify contractor readiness for the functional testing process. Document deficiencies for future resolution.

F. Witness contractor performed functional testing process as appropriate to verify contractor compliance with the functional testing procedures. Document deficiencies for future resolution.

G. Provide the District, Construction Manager, Contractor, Architect, and Engineer with a Final Commissioning Report to document the commissioning process and to verify that the commissioning process is complete.

1.07 DUTIES AND RESPONSIBILITIES OF OTHERS FOR COMMISSIONING

A. The commissioning process will require the active participation of persons qualified to represent the District, Mechanical Engineer, Electrical Engineer, General Contractor, Equipment Manufacturers' Representatives, Mechanical Contractor, HVAC Contractor, Controls Contractor, TAB Contractor, Electrical Contractor, and other specific subcontractors, as deemed appropriate. The SCA will witness the final functional performance commissioning process. Participants shall include in their contracts all costs necessary to participate in and complete the commissioning process.

B. Contractor will assure the participation and co-operation of Subcontractors, as required to complete the commissioning process.

C. The District will assure the participation of their chosen representatives as required to complete the commissioning process.

D. The Architect will assure the participation of necessary representatives from the Design Team as required to complete the commissioning process. Design team members will provide prompt replies to requests for information issued during the commissioning process.

E. It is the Contractor's specific responsibility to complete their respective start-up and checkout procedures, and to insure the complete readiness of equipment and systems, prior to the start of the functional performance

testing phase. The SCA shall request written confirmation of system readiness for performance testing, from the appropriate subcontractor or Contractor. Once the SCA is provided with confirmation of all related systems completion, the actual date and times for the functional performance testing process will be confirmed. Contractors shall provide sufficient time, and qualified representatives, to complete this process.

F. After a second failure of a system to successfully meet the criteria as set forth in the functional performance testing process, the Contractor shall reimburse the District for all costs associated with any additional re-testing efforts made necessary due to remaining Contractor related system deficiencies previously reported by the Contractor as corrected. These costs shall include salary, travel costs and per diem lodging costs (where applicable) for the SCA. Rates to be used:

Mileage:	$0.35/Mile
Per Diem Lodging:	$115.00/Day
Salary:	$100.00/Hour

G. Training on related systems and equipment operation and maintenance shall only be scheduled to commence after final performance commissioning is satisfactorily completed, and systems are verified to be 100 percent complete and functional.

1.08 SUBMITTALS

A. Submit under provisions of Document 01 33 00 Submittals.

B. Pre-Commissioning Checklist Forms: Submit two (2) signed copies of the checklist forms to the SCA upon completion of all listed items.

C. Equipment Manufacturer's Startup Forms: Submit two (2) completed copies of the installation and startup checklists provided by the equipment manufacturers to the SCA.

D. Test Reports: Submit two (2) copies of test reports for equipment and systems to the SCA.

E. Control Schematics: Submit two (2) copies of the control schematics for equipment, systems, and subsystems to the SCA.

F. Inspection Records: Submit two (2) copies of the records of inspections for code compliance, and approved permits and licenses to operate the equipment and systems to the SCA.

G. Operating Data: Submit two (2) copies of equipment and system operating data including all necessary instructions to facilitate operation to specified performance standards to the District.

H. Maintenance Data: Submit two (2) copies of equipment and system maintenance data including all necessary information required to maintain the equipment and systems in continuous operation, such as the testing, balancing and adjusting report and the as-built drawings.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition of existing improvements indicated on the Drawings and required for completion of the work.
2. Disconnecting, capping or sealing, and removing of utilities.

1.2 RELATED REQUIREMENTS

A. Section 01 3516, Alteration Project Procedures.

B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

C. Section 01 7329, Cutting and Patching.

D. Section 01 7419, Construction Waste Management and Disposal.

E. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and

F. Section 02 2600, Hazardous Material Assessment (Various Materials).

G. Section 02 2623, Asbestos Assessment.

H. Section 02 2626, Lead Assessment.

I. Section 02 2629, Hazardous Materials Assessment – PCB Ballasts and Fluorescent Lamps.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. California Fire Code (CFC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

D. American National Standards Institute (ANSI):

1. ANSI A10.6: Safety and Health Program Requirements for Demolition Operations.

E. National Fire Protection Association (NFPA):

1. NFPA 241: Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.4 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner as directed.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Salvage Elements: Element to be removed from the existing construction and to be retained for reinstallation or potential reuse.

E. 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 recycled.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Pre-demolition Meeting: Prior to start of demolition operations, the Contractor shall meet with Architect and Owner’s Project Inspector at Project site to review methods and procedures related to demolition including, but not limited to, the following:

1. Inspect and discuss condition of existing improvements to be demolished.
2. Protection requirements.

1.6 SCHEDULING

A. Schedule work to coincide with new construction and Owners use of affected and unaffected facilities.

B. No demolition shall occur when the site is occupied by students or staff without proper protection measures and written consent of Owner.

1.7 MATERIALS OWNERSHIP

A. Items of interest or value to Owner that may be encountered during building demolition and not identified on the Drawings, remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage, unless otherwise instructed.

1.8 ACTION SUBMITTALS

A. None.

1.9 INFORMATIONAL SUBMITTALS

A. Qualification Data: For demolition firm if a separate subcontractor will be used.

B. Pre-demolition photographs.

C. Record of Pre-demolition Meeting.

D. Inventory: List of items that have been removed and salvaged.

E. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Demolition Debris: Verification of compliance with waste reduction requirements specified in Section 01 8113, Sustainable Design Requirements.

1.10 QUALITY ASSURANCE

A. Qualifications:

1. Demolition Firm: Company specializing in performing the Work of this Section with minimum of five years' experience.

B. Obtain required permits from authorities and agencies.

C. Comply with governing EPA notification regulations before beginning demolition.

D. Comply with hauling and disposal regulations of authorities having jurisdiction.

E. Comply with ANSI A10.6 and NFPA 241.

F. Fire protection during demolition shall be in accordance with California Fire Code, Chapter 33.

G. The Owner's Project Inspector will be present at the site when removal operations are in progress. Should an unplanned event occur, the Contractor shall immediately provide the Project Inspector with the procedure of operation to correct or remedy the occurrence. The Project Inspector will report details of the event and the procedures employed by the Contractor for correction. The Contractor shall provide the Project Inspector with its proposed procedures to eliminate similar events in the future.

1.11 STORAGE FACILITY REQUIREMENTS FOR SALVAGED ITEMS

A. Furnish facility of sufficient size and capacity to store and retrieve items identified for salvage. A contiguous, isolated, centralized area shall be furnished to the greatest extent possible.

B. Physical Requirements: Facility shall comply with the following unless applicable to the items being salvaged and approved by the Owner.

1. Covered loading and unloading area to allow for transport of elements without exposure to inclement weather conditions.
2. Configuration of space shall allow for adequate ventilation of stored elements; provision of mechanical devices to circulate air will be required if ventilation is inadequate.
3. Ambient Conditions:
    a. Maintain ambient temperature of a minimum of 45 degrees F to a maximum of 100 degrees F.
    b. Maintain a relative humidity between 20-80 percent.
    c. Climate control is not required if these conditions can be met.
4. Adequate artificial light to allow for proper handling of elements and for potential examination of salvage elements at the facility.
5. Adequate protection from degradation due to ultraviolet (direct) sunlight.
6. Protection from exposure to water. No exposure of salvage elements and/or packing materials to moisture will be permitted.
7. Protection from vermin and pests is required. Vermin and pests include, but are not limited to, rats, mice, insects, birds, bats, and squirrels.
8. Functioning smoke alarm, fire detection/notification, and sprinkler system.

C. Security: An off-site facility shall comply with the following.

1. Facility must be a bonded facility of sufficient bonding capacity to suitably replicate and replace all stored salvage elements.
2. Facility must provide an inventory and receiver control to adequately monitor and document storage activities.

1.12 FIELD CONDITIONS

A. Do not close or obstruct egress width to exits.

B. Do not disable or disrupt building fire or life safety systems without 3 day prior written notice to the Owner. Portions of the building and other buildings on-site not a part of the Contract shall not be left unprotected during non-work hours.

C. Conform to procedures applicable when discovering hazardous or contaminated materials.

1.13 REMOVED MATERIALS

A. Materials or equipment noted to be removed is at the discretion of the Contractor. Storage or sale of removed items will not be permitted on Project Site. Transport salvaged items from Project Site as they are removed.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 EXAMINATION

A. Conduct a pre-construction survey of existing conditions, adjacent improvements to remain, and correlate the survey with requirements included in the Demolition Plan. Survey shall be documented with the pre-construction photographs.

B. Inventory and record the condition of items to be removed and salvaged.

C. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to Architect.

D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.2 PREPARATION

A. Provide, erect, and maintain temporary barriers and partitions at locations indicated or as needed to safeguard occupants and pedestrians.

B. Erect and maintain weatherproof closures for exterior openings.

C. Erect and maintain temporary partitions to prevent spread of dust, odors and noise to permit continued Owner occupancy.

D. Clearly mark and protect existing materials and equipment which are not to be demolished.

E. Existing Utilities: Mark location of all utilities and seal or cap off indicated utilities in work area prior to start of demolition.

3.3 DEMOLITION

A. Conduct demolition to minimize interference with adjacent and occupied building areas.

B. Maintain and protect egress and access at all times.

C. Demolish in an orderly and careful manner. Protect existing supporting structural members.

D. Cease operations immediately if structure appears to be in danger. Notify Architect. Do not resume operations until resumption is approved by Architect.

E. Removed and Salvaged Items: Comply with the following.

1. Clean salvaged items of dirt and demolition debris.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items until re-installation or delivery to Owner.
   a. If required on-site facilities are not available, store off-site.
   b. Both on-site and off-site storage facility shall be acceptable to the Owner and shall comply with the specified requirements.
4. Items not scheduled to be re-installed shall be transported to Owner as directed.
5. Protect items from damage during transport and storage.

F. Except where noted otherwise, remove demolished materials from site. Do not burn or bury materials on site.

G. Remove and legally dispose and recycle demolished materials from site as work progresses. Documentation of legal dumping and recycling shall be obtained and submitted in accordance with requirements of Section 01 7419, Construction Waste Management and Disposal.

H. Remove temporary work.

3.4 REPAIR

A. Where fasteners are removed from existing surfaces or when temporary penetrations are necessary patch and repair holes and openings to match adjacent surface.

B. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing in accordance with Section 01 7329, Cutting and Patching.

3.5 SALVAGE AND PROTECTION

A. Remove and salvage the following materials and equipment to be reinstalled:

1. Items as indicated on the Drawings.

B. Remove and salvage the following equipment to be retained by the Owner.

1. Items as indicated on the Drawings.

C. Owner will remove and keep the following material and equipment:

1. Furnishings not built in or connected to the structure and in the way of construction.

D. Protect the following materials and equipment:

1. Existing mechanical systems.

2. Under floor plumbing lines.
3. Systems, equipment and finishes which are to remain, inside and outside.

3.6 CLEAN UP

A. Return adjacent areas outside of the work area to condition existing before demolition operations began.

B. After materials have been removed from the site, broom clean all affected areas.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Forms for concrete, including but not limited to slabs-on-grade, foundations, retaining walls, mechanical and electrical items, such as cleanouts, valve access boxes and pads.
2. Installation of bolts, anchors, sleeves, slots and inserts furnished under other Sections, except embedded items for mechanical items installed by trade involved.
3. Pockets in slabs to receive hollow metal door frames.

1.2 RELATED REQUIREMENTS

A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

C. Section 03 2000, Concrete Reinforcing.

D. Section 03 3000, Cast-In-Place Concrete; waterstops, formwork inspection.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. American Concrete Institute (ACI):

1. ACI 301. Specifications for Structural Concrete.
2. ACI 303R: Guide to Cast-in-Place Architectural Concrete Practice.
3. ACI 117: Specification for Tolerances for Concrete Construction and Materials.
4. ACI 347R: Guide to Formwork for Concrete.

D. ASTM International (ASTM):

1. C578: Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
2. D994/D994M: Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
3. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

4. D1752: Standard Specification for Preformed Sponge Rubber, Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

E. APA - The Engineered Wood Association (APA).

1. PS-1: Voluntary Product Standard, Structural Plywood.

F. Underwriter Laboratories (UL):

1. UL723: Tests for Surface Burning Characteristics of Building Materials.

G. West Coast Lumber Inspection Bureau (WCLIB), "Standard Grading and Dressing Rules, No. 17."

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Coordinate with all trades to insure proper placement of all items in forms and to provide proper blockouts wherever required.

C. Notify Inspector, Architect, Structural Engineer and DSA at least 2 business days prior to placing of concrete.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Formwork: Submit showing all parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
   a. Exposed Concrete Surfaces: Show the general construction of forms including jointing, formed joints or reveals, form tie locations, and pattern of form placement, and other items that affect the exposed concrete visually.
   b. Shop drawings and calculations for formwork sealed by the design engineer in responsible charge licensed in the State of California.
2. Construction and Contraction Joints: Show the location of construction and contraction joints proposed if different from those indicated on the Drawings.

B. Product Data: Manufacturer’s descriptive literature for proprietary materials and items to be used including the following:

1. Form ties.
2. Form release agent.

3. Expansion joint filler materials.
4. Other items as requested by Architect.

C. Samples: Only as requested by Architect.

1.6 INFORMATIONAL SUBMITTALS

A. Testing for Formwork Removal: Data on method for determining strength of concrete for removal of formwork proposed by Contractor when a method other than field-cured cylinders is proposed.

B. Certification that the formwork, shoring and bracing designs have been reviewed and signed by a civil or structural engineer registered in the State of California. Certification may be in the form of a letter on the engineer's letterhead and bearing the engineer's stamp.

C. Material Certificates, signed by manufacturer, certifying that each of the following items complies with specified requirements:

1. Form materials and form-release agents.
2. Joint-filler strips.

D. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Composite Wood: Evidence of compliance that products meet formaldehyde limits of current CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
   b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.

C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

D. Embedded Items: Where items, such as embedded plates, reglets, anchors, fastenings, conduit, piping and other items are supplied by other trades and included under other

Sections, coordinate and obtain approval of their placement in the forms prior to placing any concrete.

E. Forms for Reuse:

1. Where applicable, construct and erect forms for reuse; withdraw projecting nails and other objects from contact surfaces before reusing; clean and completely recondition all forms prior to reuse.
2. Obtain approval for form reuse.
3. Forms will be approved for reuse provided they are straight, clean, free from nails, dirt, hardened concrete, rust, and other injurious matter and edges and surfaces are in good condition.
4. Clean and repair damage caused by placing, removal, or storage.
5. Reuse of formwork with patches or repairs that would reduce quality of exposed-to-view concrete will not be permitted.

F. Mockups:

1. General:
   a. Notify Architect 10 business days in advance of dates and times when mockups will be constructed.
   b. Retain samples of cements, sands, aggregates, and color additives used in mockups for comparison with materials used in Work.
   c. Unless otherwise instructed by the Architect, demolish and remove mockups when no longer required to be used as a benchmark for performance.
2. Free-Standing Site Mockup: Provide in location to allow for Architect's review of appearance color, texture, and primary and secondary reveals. Comply with the following specific requirements for architectural cast-in-place concrete:
   a. Mix design shall match that proposed for use in final construction including cement. Concrete finish for mockup appearance shall match finish of Architect's control sample or photograph.
   b. Form release agent, if required in final construction, shall also be used on mockup.
   c. Mockup will be evaluated for visual appearance of concrete, texture, workmanship, and patching methods. Include typical formwork intersection and corner treatment.
   d. One half of each mockup shall be treated with specified water and graffiti repellent.
   e. Prepare at least one month before start of final concrete work to allow concrete to cure before application of repellent and Architect's observation.
   f. Repairs: Representative areas of concrete shall be intentionally damaged, in the presence of the Architect, to mimic honeycombing, spalling, and other defects as may be experienced upon stripping of formwork.
      1) Repair to demonstrate materials and methods proposed for repair of surface blemishes.
      2) Specific procedures and materials used for patched area shall be thoroughly documented.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver form release agents in manufacturer's sealed and trademarked containers.

1.9 FIELD CONDITIONS

A. Measurements: Make and be responsible for field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

B. Where concrete bases or foundations are required for equipment furnished by other Sections, verify dimensions for equipment furnished before concrete is placed.

C. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Design and construction of concrete formwork is the responsibility of the Contractor.

B. Construct formwork for erection in satisfactory sequence and removal without damage to the resulting concrete surface.

C. Design, erect, support, brace and maintain formwork and shoring to safely support all vertical and lateral loads that might be applied until such loads can be carried by concrete.

D. Form to produce smooth concrete - straight, plumb and true to plane. Concrete out of line, level or plumb will be rejected.

E. Allowable Tolerances:

1. Variations from plumb and designated building lines shall not exceed the tolerances specified in ACI 117.
2. Conform to suggested tolerances of ACI 347.

F. Sustainable Design:

1. Composite wood products must meet current formaldehyde emission limits of CARB Airborne Toxic Control Measure (ATCM) as specified in Section 01 6116.
2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 FORM MATERIALS

A. General:

1. Form materials shall be new at start of job.

2. Intent is to produce high-quality concrete construction with minimum defects owing to joints, deflection of forms, roughness of forms, or other concrete defects caused by poor form materials or workmanship.
3. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which are warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.

B. Rough Form Finish Surfaces: Plywood, lumber, metal, or other material of sufficient strength and stiffness to hold concrete properly in place, and prevent leakage of mortar.

C. Smooth Non-Architectural Form Finish Surfaces: APA rated, five-ply 5/8 inch minimum, B-B Plyform, Class I or II as required by strength and tolerance requirements, Exterior Grade, edge sealed, with mill-oiling treatment omitted.

D. Earth Forms:

1. Unless otherwise indicated on Drawings, concrete for foundations and grade beams which are to permanently remain below grade may be placed directly against neatly cut excavated surfaces.
2. Earth banks shall be sufficiently stable to maintain shape and width of footing shall be increased by 2 inches. When this condition applies, form top edges to prevent sloughing of earth into footings.
3. Maintain minimum reinforcing steel clearances indicated on Drawings.
4. Concrete exposed to view on exterior shall be formed to minimum depth of 6 inches below finished grade.

E. Framing: At Contractor option, subject to meeting necessary strengths and surface tolerances.

2.3 FORM ACCESSORIES

A. Form Ties:

1. General:
   a. Provide units that will leave no metal within 1-1/2 inches of concrete surface.
   b. Ties for exposed concrete shall be of same type throughout Project.
   c. Wire ties and wood spreaders for footings, shallow foundations, and other surfaces totally concealed below grade are to be used only upon specific acceptance of Architect.
2. Typical: Snap off metal of fixed length, designed to prevent spalling of concrete upon removal.

B. Spreaders: Metal. Wood spreaders, if used, shall not remain in concrete.

C. Form-Release Agents: Commercially manufactured agents that will prevent formwork absorption of moisture, and prevent bond with concrete,

1. Exposed Concrete: Agents shall provide clean, stain-free concrete release and not interfere with future-applied coatings and finishes.

2. Unexposed Concrete: Contractor's option.

D. Construction and Control Joints:

1. Acceptable Materials:
   a. Minimum 26 gauge galvanized steel shapes to form tongue-and-groove joint.
   b. 24-gauge galvanized steel splice plates.
   c. 16-gauge galvanized steel stakes.
2. Manufacturers and Products: As follows, or equal.
   a. “Burke Joint Key” by Meadow Burke.
   b. “Pro-Key” by BoMetals, Inc.

E. Chamfer Strips, Reveals, and Score Marks:

1. Extruded polyvinyl chloride specially produced for concrete work; Greenstreak, or equal.
2. Material usages shall be consistent for each application.

F. Expansion Joint Material: Preformed 1/2 inch manufactured for use as concrete expansion joint material and conforming to ASTM D994/D994M, ASTM D1751, or ASTM D1752.

G. Other Embedded Items: Use waterstops, sleeves, inserts, anchors, reglets, dovetail anchor slots, and other embedded items of the material and design indicated and specified under other Sections.

PART 3 - EXECUTION

3.1 PREPARATION

A. Vertical and Horizontal Controls:

1. Establish and maintain bench marks, lines, or controls throughout construction.
2. Forms and falsework shall be to final elevations compatible with finished floor elevations and form material.

B. Coordinate with other Sections, and provide for openings, sleeves, chases, reglets, pipes, recesses, nailers, anchors, ties, inserts, and similar embedded items.

C. Coordinate with Section 03 3000, Cast-in-Place Concrete, for requirements governing embedment and sleeving of pipes and conduit.

3.2 CONSTRUCTION OF FORMS

A. General:

1. Metal or wood stakes are not allowed in areas to be concreted.
2. Build forms to shapes, lines, grades and dimensions indicated and to maintain tolerances required by ACI 301 and as scheduled.

3. Construct wood forms of sound lumber, straight and rigid, thoroughly braced, mortar tight, and of such strength that pressure of concrete and movement of workers and equipment will not displace them.
4. Arrange forms to allow proper erection sequence and to permit form removal without damage to concrete.
5. Visible waves in exposed concrete surfaces after stripping of forms may result in rejection of that portion of concrete.
6. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.
7. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.
8. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.
9. Form bevels, grooves and recesses to neat, straight lines.

B. Formwork for Smooth Exposed Concrete:

1. Forms shall be constructed of plywood.
2. Plywood panels shall be clean, smooth, uniform in size, and free from damaged edges or faces, including holes other than those required for form ties.
3. Use full-size (4-x-8-foot) panels wherever possible.
4. Keep size of smallest forms to minimum of 18 inches.
5. Make plywood panel pattern regular and symmetrical, joints plumb or level, horizontal joints continuous.
6. Align form ties vertically and horizontally.
7. Block plywood edges which do not occur at bearing points to eliminate joint offsets.

C. Framing and Bracing:

1. Framing, bracing, and supporting members shall be of ample size and strength to safely carry, without excessive deflection (exceeding allowable tolerances), dead and live loads to which formwork may be subjected. Space close enough to prevent apparent bulging or sagging of forms.
2. Shores and struts shall be provided with positive means of adjustment and settlement shall be taken up during construction.

D. Form Ties:

1. Form ties shall be of sufficient strength and quantity to prevent spreading of forms.
2. Ties for exposed concrete surfaces shall be arranged symmetrically and shall be aligned both vertically and horizontally. Do not stagger.
3. Slope tie-wires downward to outside of wall.

E. Slab Control Joints:

1. Install tongue and groove joint material for interior slabs and elsewhere as indicated on Drawings.

2. Maximum area between joints is limited to 225 square feet, maximum length between joints is limited to 16 feet, aspect ratio of length to width is limited to 1.25 to 1.
3. Contractor can set joint spacing within above limits to suit placing schedule except that all joints specifically shown on Drawings must be set as so located.
4. Where joint spacing is not shown, submit proposed locations to suit slab-on-grade detail shown on the Drawings.

F. Expansion Joints:

1. Provide expansion joints where shown or noted on Drawings.
2. Place joint filler in straight line with edge held back to specified dimension from finish surface and secured to formwork or previously placed construction.
3. Use fiber type joints typically and hold edge back 1/8 inch from concrete surface.
4. Use cork type joint fillers at sealed joints and hold edge back 1/2 inch. After curing concrete, carefully clean, prime and fill joints with sealant to 1/8 inch from the finished surface in accordance with manufacturer's recommendations.

G. Cleanouts:

1. Provide cleanouts along bottom of walls or elsewhere as required to permit thorough cleaning of loose dirt, debris, and foreign material.
2. Cleanouts shall not be apparent on exposed concrete surfaces.

H. Corners:

1. Chamfer corners of exposed concrete surfaces, unless noted otherwise on the Drawings.
   a. Obtain chamfers by placing 3/4-inch-x-3/4-inch moldings in forms.
   b. Pieces shall be longest lengths possible.
   c. Miter joints.
2. Do not bevel re-entrant corners or edges of formed joints of concrete unless otherwise shown.

I. Form Release Agent: Before placement of reinforcing steel, thoroughly clean forms and coat faces of forms to prevent absorption of moisture from concrete and to facilitate removal of forms.

1. Apply l in conformance with manufacturer's written directions.
2. Before re-using form material, inspect, clean thoroughly, and recoat.
3. Avoid starved areas or excessive applications.
4. Seal cut edges.

J. Tolerances: In addition to ACI 303.1 limits on form-facing panel deflection, limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, in accordance with the form offset Categories as follows at the locations indicated:

1. Exterior-Architectural Concrete: Class A, 1/8 inch.

3.3 FALSEWORK

A. Contractor shall be fully responsible for proper strength, safety, and adequacy for falsework, supports, and bearing surfaces used on and in connection with the work.

B. Falsework shall support imposed loads without deformation, deflection, or settlement.

C. Construct shores for soffits of joists to permit removal of forms without removal of shores.

3.4 RESHORING AND BACKSHORING

A. During reshoring and backshoring, do not allow concrete in beam, slab, column, or any structural member to be loaded with combined dead and construction loads in excess of the specified design loads and concrete compressive strength.

B. Place reshores and backshores in sequence with stripping operations.

C. Tighten reshores and backshores to carry the required loads without overstressing the concrete members. Leave them in place until required tests indicate the concrete compressive strength has attained the minimum value specified.

3.5 CLEANING

A. Remove wood chips, sawdust and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove water from excavations.

B. Leave no wood in concrete, except nailers.

3.6 ADJUSTING

A. During and immediately after concrete placing, tighten forms, posts and shores.

B. Readjust to maintain grades, levels and camber.

3.7 FORM REMOVAL

A. Remove forms and falsework so as to ensure safety of structure. Do not remove supports until members have sufficient strength to support their own weight and superimposed loading with proper factor of safety.

B. Remove forms for exposed concrete so as to avoid damage to finish. Do not use pinch bars and similar tools for prying against exposed surfaces.

C. After concrete is placed, the following times shall elapse before removal of forms or shoring, unless approved otherwise by the Architect.

1. Vertical Forms of Foundations: Form 5 days.
2. Walls and Columns: Form 10 days.
3. Edges of Slabs and Sides of Footings: Form 7 days.
4. Concrete Columns and Beam Soffits: Form 10 days, shores 21 days after placement or until concrete achieves its 28 day design compressive strength, whichever is longer.

D. Upon removal of forms, remove bolts, wires, clamps, rods, and similar items not necessary to finished work to minimum 1 inch from surface. Remove them in such a way as to eliminate danger of rust stains from form-tie materials or other unprotected ferrous materials embedded in or adjacent to exposed concrete surfaces.

E. Where forms are removed in less than 7 days, or 14 days for walls, curing shall be continued as follows:

1. Loosen form ties and run water down inside of form to keep concrete wet.
2. Immediately following form removal thoroughly wet surface.
3. Continue curing in accordance with provisions of Section 03 3000, Cast-in-Place Concrete.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Reinforcing for concrete.
2. Reinforcing for concrete masonry units
3. Installation accessories.

1.2 RELATED REQUIREMENTS

A. Section 01 4523, Testing and Inspection Services.

B. Section 03 1000, Concrete Forming and Accessories.

C. Section 03 3000, Cast-In-Place Concrete.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. American Concrete Institute (ACI):

1. ACI 117: Tolerances for Concrete Construction and Materials.
2. ACI 301: Specifications for Structural Concrete.
3. ACI 315: Manual of Standard Practice for Detailing Reinforced Concrete Structures.
4. ACI 318: Building Code Requirements for Reinforced Concrete.

D. Concrete Reinforcing Steel Institute (CRSI):

1. Manual of Standard Practice.

E. ASTM International (ASTM):

1. A706/A706M: Standard Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
2. A1064/A1064M: Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

F. American Welding Society (AWS):

1. D1.1/D1.1M: Structural Welding Code – Steel.
2. D1.4/D1.4M: Structural Welding Code – Steel Reinforcing Bars.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

B. Coordination:

1. Coordinate reinforcing with the other work affected by these operations, such as forms, electrical work, mechanical work, and structural steel concrete.
2. Coordinate resolution of or procedures whenever pipes, conduits, sleeves, and other construction interferes with placement.

1.5 ACTION SUBMITTALS

A. General: Review does not imply or state that fabricator has correctly interpreted the construction documents.

B. Shop Drawings: Show complete bending and placing details of reinforcement.

1. Details of reinforcement not covered shall be in accordance with ACI 318 and ACI 315.
2. Detailing, fabricating, and spacing of reinforcement shall be equal or superior to ACI 315, unless otherwise indicated.
3. Check Architectural, Structural, Mechanical, and Electrical Drawings for anchor-bolt schedules and locations, anchors, inserts, conduits, sleeves, and other items to be cast in concrete. Reinforcing steel shall not interfere with placement of such embedded items.
4. Do not fabricate or place reinforcing steel until shop drawings have been reviewed and returned to Contractor.
5. Review of shop drawings will not constitute relief of responsibility for errors or for failure in accuracy and complete placing of the work.

C. Product Data:

1. General:
   a. List and complete descriptive data of products proposed for use.
   b. Include manufacturer's specifications, installation instructions, and maintenance instructions.
2. Mechanical Splices: Types of mechanical splices proposed for use. Include the latest ICC-ES Reports (ESR) for threaded or sleeve-type splices to verify compliance with specified requirements.
3. Headed Bars or Terminators: Types of headed bars or terminators proposed for use. Include the latest ESR to verify compliance with the specified requirements.

1.6 INFORMATIONAL SUBMITTALS

A. Statement of qualifications for fabricator, installer, and welders.

B. Welding Procedures and Qualifications: Description of reinforcement weld locations, welding procedures, and welder qualifications when welding is permitted.

C. Certificates: Certified copies of mill test reports for each bundle of reinforcing bars delivered to the site, indicating physical and chemical properties for each heat. In addition, show correlation between a specific heat number and specific sizes from that heat number and location in which those bars will be placed.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Welder Qualifications:

1. Welders shall be qualified in the last six months in accordance with the American Welding Society, AWS D1.4.
2. Welding procedures qualified by others and welders qualified by another employer may be acceptable as permitted by AWS D1.4.
3. If re-qualification is required, the cost of these qualification tests shall be borne by the Contractor.

B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

C. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.

D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

E. Conflicting requirements: In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards or these specifications, the provisions of the more stringent shall govern.

F. Shop Quality Assurance:

1. General:
   a. Testing and inspection of shop-fabricated components or assemblies will be the same as specified for field quality assurance in Part 3.
   b. Identify reinforcing and verify reinforcement is of type and grade specified.
2. Testing:
   a. Reinforcing shall be tested in accordance with CBC Section 1910A.2.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver reinforcing bars in bundles with tags showing quantity, grade, size, and suitable identification to allow checking, sorting, and placing.

1. Identification of steel shall be maintained after bundles are broken.
2. Bundles of flat sheets and rolls of welded wire fabric shall be tagged showing quantity, style designation, width, and length.

B. Store reinforcement at site in a manner to prevent excessive rusting or fouling that will interfere with bond.

1.10 FIELD CONDITIONS

A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Allowable Tolerances: Fabrication and placement tolerances shall be in accordance with ACI 117.

2.2 REINFORCING STEEL

A. Reinforcing bars shall conform to ASTM A615/A615M, Grade 60, or ASTM A706/A706M. For reinforcing bars conforming to ASTM A706, which will be welded, furnish a report of the chemical analysis for each heat of the bars.

B. Plain and Deformed Wire: ASTM A1064/A1064M.

C. Spiral Reinforcement: Plain, cold-drawn wire conforming to ASTM A1064 if indicated as wire, or hot-rolled rods conforming to ASTM A706/A706M if indicated as bars.

2.3 ACCESSORIES AND ADDITIONAL MATERIALS

A. Bar Supports: In accordance with CRSI Manual of Standard Practice; types and sizes as required for the conditions of the installation.

1. For exposed to view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are hot-dipped galvanized, plastic. or stainless steel, in accordance with CRSI Class 1.
2. Provide precast concrete blocks not less than 4 inches square when supporting reinforcing steel on ground. Precast concrete blocks shall have a compressive strength equal to that of surrounding concrete.

B. Mechanical Couplers:

1. Couplers shall match or exceed strength of rods they connect.

C. Deformed Bar Anchors: Nelson Stud Welding Division of Stanley Engineered Fastening, Stud Welding Products, Inc., or equal.

D. Headed Bars or Terminators: Headed Reinforcement Corp., or equal.

1. Net head area at least **[4]** times the bar area.

2.4 FABRICATION

A. Refer to the Drawings for bar sizes, number of bars, and placing details.

B. Conform to requirements of Chapter 25 and Section 26.6 of ACI 318 except lap bar splices shall be as indicated on the Drawings.

C. Bending:

1. Minimum bend diameters and hook extensions as shown on the Drawings.
2. Reinforcing bars are to be bent cold unless heating is permitted.
3. Do not bend or kink reinforcing except as shown on the Drawings.

D. Spirals: Provide a minimum of 1-1/2 finishing turns top and bottom.

E. Install mechanical couplers and headed bars in accordance with manufacturer's recommendations and ICC ES Report.

F. Deformed Bar Anchors:

1. Detailing of bends, hooks, and similar items, to comply with requirements for reinforcing bars.
2. Install deformed bar anchors in accordance with the manufacturer's recommendations and the requirements of AWS D1.1.

G. Steel reinforcement shall not be bent or straightened in a manner that will injure material. Bars with kinks or bends not shown on Drawings are not permitted.

1. Heating of bars for bending will not be permitted.
2. Straightening or rebending will not be permitted without approval by the Architect and DSA.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine excavations in accordance with requirements specified in Division 31, Earthwork, prior to placing reinforcement.

B. Wherever embedded items interfere with placement of reinforcement, notify Architect and obtain written approval before placing any concrete.

3.2 INSTALLATION

A. Bar Reinforcement:

1. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations.
2. Do not exceed the tolerances defined in ACI 117 or ACI 318 Section 26.6 or CBC Section 1907.5.
3. Where Drawings do not show the spacing of the reinforcing, provide minimum clear spacing in conformance with ACI 318 Section 25.2 not less than 4/3 times the maximum size aggregate.
4. Dowels shall be tied securely in place before concrete is deposited.
5. Do not install kinked, bent or misplaced reinforcing.
6. When necessary to move reinforcement beyond the specified placing tolerances to avoid interference with other reinforcement or embedded items, submit the resulting arrangement of reinforcement for acceptance.
7. Continue reinforcement across construction joints at least equal to lap development lengths on either side of the joint unless otherwise detailed.

B. Welded Wire Fabric (WWF) Reinforcement:

1. Install welded wire fabric in lengths as long as practicable.
2. Lap adjoining pieces a minimum of 18 inches and at least one full mesh.
3. Offset laps of adjoining widths to prevent continuous laps in either direction.

C. Field Bending:

1. Field bending or straightening shall be in accordance with ACI 301 Section 3.3.2.8.
2. Do not re-bend reinforcement that has previously been bent within 6 inches of new bend except as shown on the Drawings or explicitly allowed by the Architect.

D. Splices:

1. General:
   a. Unless otherwise shown on Drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices at adjacent splices whenever possible.
   b. Bar laps shall be wired together.
2. Lap splice lengths as shown on the Drawings
3. Welded Splices: Butt and complete penetration weld per AWS D1.4 to develop, in tension, not less than 125 percent of bar yield strength.

E. Anchor Bolts and Rods:

1. Supervise setting of anchor bolts required for wood framing and anchor rods required for erection of structural steel to ensure correct installation and location.
2. Anchor bolts and rods must be securely held in place and aligned in a true straight line prior to and during concrete placement.

3. Anchor bolts and rods may not be, pushed into wet concrete.

F. Cover:

1. As a minimum, provide the concrete cover shown on the Drawings.
2. Tolerances on concrete cover shall meet the requirements of ACI 117.

3.3 CLEANING

A. At time of placing concrete, clean reinforcement and other embedded items thoroughly of loose rust, mill scale, oil, grease, and other foreign material that reduces or destroys bond.

B. Rust and mill scale that is “tight” to the bar will be allowed to remain.

C. Rust that is flaky or easily removed, such as by dropping or striking with a hammer, indicates excessive rust. Such bars shall be cleaned of rust, and not be used unless found to comply with ACI 318 Section 26.6.1.2.

D. Where there is a potential of rust staining adjacent finish surfaces, take necessary steps to prevent staining.

3.4 FIELD WELDING

A. Welding of reinforcing bar shall be performed only where indicated on the Drawings and in compliance with AWS D1.4. Welding of reinforcement is to be inspected in accordance with CBC Section 1705A.3.2.

3.5 FIELD QUALITY CONTROL

A. Approval of reinforcing steel, after installation, must be received from the Owner’s Project Inspector. Architect, Structural Engineer, and DSA.

1. Notify Inspector, Architect, Structural Engineer, and DSA at least two business days before concrete is to be poured or reinforcing is covered up.
2. Inspection will include the following:
    a. Reinforcing for conformance with ACI 318 Sections 25.2, 25.3, 25.5, 25.6, and 36.6.
    b. Verification that anchor bolts, anchor rods and other embedded items are held firmly in position prior to placing concrete.
    c. Re-bent bars for signs of cracking or fracture.
    d. Installation of deformed bar anchors in accordance with Section 7.1 of AWS D1.1 and corresponding ESR.
    e. Mechanical coupler installation in accordance with corresponding ESR.
3. The following reinforcing steel work will be considered defective and shall be removed and replaced by the Contractor at no additional cost to the Owner:
    a. Bars with kinks or bends not shown on the Drawings.
    b. Bars injured due to bending or straightening.
    c. Bars heated for bending.

d. Reinforcement not placed in accordance with the drawings and/or specifications.

4. Allow sufficient time to perform any corrective actions prior to concrete pour.

B. Owner's Testing Agency will provide the following:

1. Inspection of welding except that cost of welding inspection required beyond 3 days total of shop and field welding will be backcharged to Contractor.
2. Provide continuous inspection during any field bending of reinforcement.

C. Keep responsible reinforcing person on job to maintain position of reinforcing as concrete is placed.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place concrete. Provide single space between subparagraphs.
2. Curing, surface treatments, and finishing performed at time of concrete placement.
3. Remedial treatments to exposed-to-view formed surfaces.
4. Aggregate base.

1.2 RELATED REQUIREMENTS

A. Section 01 4520, Concrete Floor Moisture Content and PH Testing.

B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

C. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

D. Section 03 1000, Concrete Forming and Accessories.

E. Section 03 2000, Concrete Reinforcing.

F. Section 03 3600, Concrete Finishes; surface treatments to cured concrete.

1.3 REFERENCES

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. American Concrete Institute (ACI) Publications and Standards: Standards and manuals listed refer to the latest edition as of the issue date of this Project Manual.

1. ACI 117: Specification for Tolerances for Concrete Construction and Materials.
2. ACI 211.5R: Guide for Submittal of Concrete Proportions.
3. ACI 301: Specifications for Structural Concrete.
4. ACI 302.1R: Guide to Concrete Floor and Slab Construction.
5. ACI 302.2R: Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
6. ACI 305R: Guide to Hot Weather Concreting.
7. ACI 306R: Guide to Cold Weather Concreting.
8. ACI 318: Building Code Requirements for Structural Concrete and Commentary.

D. ASTM International:

1. C33/C33M: Standard Specification for Concrete Aggregates.
2. C94/C94M: Standard Specification for Ready-Mixed Concrete.
3. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
4. C150/C150M: Standard Specification for Portland Cement.
5. C171: Standard Specification for Sheet Materials for Curing Concrete.
6. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
7. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
8. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
9. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
10. C989/C989M: Standard Specification for Slag Cement for Use in Concrete and Mortars.
11. C1059/C1059M: Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.
12. C1077: Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.
13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
14. C1602/C1602M: Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.
15. D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
16. D5084: Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
17. E329: Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
18. E1155: Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Pre-installation Meeting: Schedule at least 30 calendar days prior to start of concrete work. Meeting shall be attended by Contractor, Contractor's Superintendent, Architect, Project Structural Engineer, Project Inspector, party responsible for concrete design mix,

party responsible for field quality control, concrete subcontractor, ready-mix concrete producer, and others whose work may affect quality of concrete, to coordinate related requirements, materials, scheduling, and procedures.

1. Notify participants at least 10 business days before conducting meeting. Include a written agenda of meeting with notice.
2. Review mix designs, material selections, and procedures to be followed in performing the work.
3. Review in detail job conditions, schedule, construction sequence, installation requirements, and quality of completed installation including Architect's expectations related to floor flatness, including installation of casework.
4. Review in detail the means of protecting completed work during remainder of construction period.
5. Record discussions of conference and any conflict, incompatibility, or inadequacy. Furnish a copy of record to each participant.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Show proposed location of construction joints and cold joints when different or in addition to those shown on the Drawings.
2. Provide section cut details through each proposed type of joint including shear keys, joint dowels, waterstops and other accessories as required.

B. Product Data: For each type of product indicated, demonstrate compliance with specified attributes.

C. Product Data: Submit manufacturer's descriptive literature for the following products showing compliance with Specifications, compliance with referenced standards, manufacturer's recommendations, and known limitations.

1. Admixtures.
2. Curing materials.
3. Non-shrink grout.
4. Waterstops.
5. Surface retarder.
6. Color additives.

D. Concrete Mix Design: Submit for each Class of concrete on the project in accordance with ACI 301 and CBC Section 1905.2.

1. Mix design shall be signed by a California Registered Civil Engineer to verify compliance with CBC.
2. As a minimum, mix designs to include the following:
   a. All materials and admixtures and their proportions.
   b. Water and cement content, water-cementitious material ratio, target slump, and combined aggregate gradation (percent retained on every sieve size).

c. Target slump and tolerance if different from that specified in ASTM C94/C94M.
d. Information on concrete materials per ACI 301 Section 4.1.2.3.
e. Evidence that aggregate is not alkali reactive per ASTM C33/C33M Appendix X1.
f. Indication of whether mix is appropriate for pumping.
g. Indication of where each mix will be used.
h. Where shrinkage limit is required, shrinkage test results.
i. Test results of total chloride content.
j. Where lightweight aggregate is used, test results per ASTM C330/C330M.
k. Where normal weight aggregate is used, test results per ASTM C33/C33M.

E. Curing Methods: Written methods, procedures, and products for curing of concrete.

1.6 INFORMATIONAL SUBMITTALS

A. Transit-Mix Delivery Slips:

1. Keep a record at the job site showing time and place of each pour of concrete, together with transit-mix delivery slip certifying contents of the pour in accordance with CBC Section 1705A.3.
2. Make all records available to the Architect and Division of the State Architect for their inspection upon request.
3. Upon completion of this portion of the work, deliver all records and the delivery slips to the Architect.
4. Batch Plant Certificates: Include with delivery of each load of concrete. Provide certificates to the Testing Agency and the Architect/Engineer as separate submittals. Concrete delivered to the site without such certificate shall be rejected and returned to the plant.

B. Qualification Data: For independent testing agency.

C. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

D. Sample of manufacturer’s warranty.

E. Record of Pre-installation Meeting.

1.7 CLOSEOUT SUBMITTALS

A. Weighmaster shall furnish certificate of compliance to DSA in accordance with CBC, Section 1705A.3.3, to DSA, certifying that all concrete furnished conforms to the ingredients and proportions established by mix designs.

1.8 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.

C. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

D. Conflicting Requirements: In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards or these specifications, the more stringent provisions shall govern.

E. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to the owner.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.

C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.

D. Store cement in weathertight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.

E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stockpile.

1.10 FIELD CONDITIONS

A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report any discrepancies to Architect before proceeding with work.

B. Placing in Hot Weather: Comply with ACI 305R.

1. Concrete shall not exceed 85 degrees F at time of placement.
2. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface drying.

3. Concrete shall be kept wet continuously after placement until implementation of curing procedure in accordance with this Specification.

C. Placing in Cold Weather: Comply with ACI 306R.

1. Protect from frost or freezing.
2. No antifreeze admixtures are permitted.
3. When deposited concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
4. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Concrete shall conform to provisions of the latest edition of the referenced ASTM and ACI publications except as modified by the requirements included herein.

B. Concrete slabs shall conform to ACI 302.1R and ACI 302.2R.

C. Sustainable Design:

1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 CONCRETE MATERIALS

A. General Requirements:

1. Cement and aggregates shall be from constant sources and shall have proven history of successful use with one another.
2. Sources of cement and aggregate shall remain unchanged throughout work, unless Architect accepts request for change made at least 10 days prior to scheduled date of placing.
3. Ready-mixed concrete shall meet requirements of ASTM C94/C94M.
4. Deviations in properties of materials tested by Owner's Testing Agency shall be cause for their rejection pending additional test results and redesign of mix by Testing Agency.

B. Portland Cement: ASTM C 150/C150M, Type II, in accordance with ACI 318 Section 3.2.

1. The cement shall be of the same brand and type and from the same plant of manufacture as the cement used in the concrete represented by the submitted field test records or used in the trial mixtures.
2. For Architectural Concrete, use one brand of cement throughout project, unless otherwise acceptable to the Architect.

C. Supplementary Cementitious Materials:

1. Fly Ash: Western Fly Ash, conforming to ASTM C 618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.
   a. Class C is not permitted.
   b. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.
2. Ground Granulated Blast Furnace Slag (GGBFS): ASTM C989.
3. Contractor to comply with all applicable regulations concerning testing for, and limiting content of, hazardous materials in supplementary cementitious materials.

D. Concrete Aggregates:

1. General:
   a. Aggregates shall be well-graded, containing a range of intermediate sizes between sand and the maximum aggregate size.
   b. Aggregates shall be free of alkali-silica reactivity. Evaluate aggregates for reactivity in accordance with ASTM C33/C33M Appendix X1.
   c. For concrete exposed to view in completed structure, provide aggregates from a single source.
   d. Maximum Aggregate Size: In accordance with notes on the Structural Drawings.
2. Normal Weight Aggregates: Conform to ASTM C33/C33M, except as modified by this Section.

E. Water: Clean and free from deleterious amounts of acids, alkalis, scale, or organic materials, and conforming to requirements of ACI 318 Section 26.4.1.3 and ASTM C1602/C1602M.

2.3 ADMIXTURES

A. General:

1. The use of admixtures shall be the responsibility of the Contractor.
2. When more than one admixture is used in the mix, furnish satisfactory evidence to the Architect that the admixtures to be used are compatible in combination with the cement and aggregates.
3. Provide only one brand of each type of admixture.
4. Admixtures shall be free of calcium chloride and thiocyanate (not more than 0.05 percent chloride ions).
5. The following types of admixtures are approved.

B. Moisture Barrier Admixture: “Concure” by Concure Systems, Phoenix, AZ, 480-820-7171, or equal.

1. Proportions: 14 ounces per 100 pounds of cementitious materials.
   a. Admixture is used in lieu of a portion of the mix water, not in addition to the mix water.

b. For purposes of calculating, fly ash, slag, fill, and similar materials are to be considered cementitious.

2. Admixture shall be plant mixed in accordance with the manufacturer's instructions. Truck and on-site mixing is not permitted.

C. Water Reducing Admixture: Conforming to ASTM C494/C494M and ACI 318 Section 3.6; "WRDA 64" by GCP Applied Technologies, or equal.

1. Admixture must receive prior approval by the Architect, Structural Engineer, and the Testing Lab, and shall be included in original design mix.

D. Air-entraining Admixture: Conforming to ASTM C260/C260M and CBC Section 1904A.1; "Daravair 1000 by" by GCP Applied Technologies, or equal.

E. Coloring Agent at Interior Concrete: Concentrated pigments specially processed for mixing into concrete and complying with ASTM C979/C979M; "CHROMIX P" (powder) or "CHROMIX L" (liquid) by Sika Corporation, or equal.

1. Color Additive Delivery Method: Manual dispensing using manufacturer's mix-ready pre-measured containers.

2.4 CURING AND SEALING MATERIALS

A. Surface Retarder for Exposed Aggregate Finishes: "Rugasol-S" by Sika Corporation, or equal.

B. Curing and Sealing Compound at Colored Concrete: Clear curing, semi-gloss compound and sealer; "CureSeal-W" by Sika Scofield, or equal.

C. Heavy Duty Color Hardener and Sealer:

1. Color Hardener: Abrasion resistant dry shake colored hardener with integral abrasive additives; "EMERCHROME SC Color Hardener" by Sika Corporation, or equal.
2. Sealer: "LITHOCHROME" Colorwax Concrete Curing Compound" by Sika Corporation, or equal.
   a. Color: To match hardener.

D. Wet Curing Blanket at Interior Slabs: The following, or equal, conforming to ASTM C171.

1. "Transguard 4000" by Reef Industries, Inc., 800-231-6074.
2. "HydraCure M5"" by PNA Construction Technologies, Inc., 800-542-0214.
3. "CONKURE Wet Curing Blanket" by Raven Industries, Engineered Films Division, 800-635-3456.

2.5 ADDITIONAL MATERIALS

A. Waterstops:

1. Hydrophilic Waterstops: Engineered swellable, conformable synthetic waterstop strip expanding in contact with water, resisting hydrostatic pressure and preventing

water from entering subgrade structures. “Adcor ES Waterstop Strips” and “Adcor ES Adhesive” by GCP Applied Technologies, or equal.

a. Waterstop shall maintain cohesive strength after volumetric expansion and during wet-dry cycling.

b. Use with manufacturer’s recommended butyl-based adhesive.

2. Flexible Waterstops: Polyvinyl chloride; “Greenstreak PVC Waterstop” by Sika Corporation; or equal.

B. Concrete Bonding Agent: The following, or equal, conform to ASTM C1059/C1059M.

1. “Weld-Crete” by Larson Products Corporation, 800-633-6668.
2. “Daraweld C” by GCP Applied Technologies, 877-423-6491.

C. Patching Mortar: One-component, trowel applied, polymer enhanced, shrinkage-compensated, fiber reinforced, cementitious repair mortar for horizontal, vertical and overhead applications; “Meadow-Crete GPS” by W.R. Meadows, 800-342-5976; or equal.

D. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking complying with ASTM C1107/C1107M; “MasterFlow 713” by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.

E. Drainage Rock Base: 3/4-inch aggregate size conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26 or equal clean free-draining gravel or crushed rock as recommended by Geotechnical Engineer.

2.6 CONCRETE MIXES

A. Designed Strength and Classes of Concrete:

1. Class "A" Concrete:
   a. Maximum Aggregate Size: 1-1/2 inch.
   b. Compressive Strength: 3500 psi 28 day with a maximum water to cementitious materials ratio of 0.55.
   c. Air Entrainment at Concrete Not Exposed to Freezing: Average air content not to exceed 3 percent.
   d. Locations of Use: Footings and other similar locations.
   e. Note: Class "B" concrete may be used in lieu of Class "A" at Contractor's option.
2. Class "B" Concrete:
   a. Maximum Aggregate Size: 1 inch.
   b. Compressive Strength: 3500 psi 28 day strength with a maximum water to cementitious materials ratio of 0.55.
   c. Air Entrainment at Concrete not Exposed to Freezing: Average air content not to exceed 3 percent.
   d. Locations of Use: Interior structural concrete less than 8 inch minimum thickness excluding slabs on grade.

3. Class "C" Concrete:
    a. Maximum Aggregate Size: 1 inch.
    b. Compressive Strength: 4000 psi 28 day strength with a maximum water to cementitious materials ratio of 0.45.
    c. Additive at Interior Slabs: Specified moisture barrier admixture added in accordance with manufacturer's written instructions.
    d. Locations of Use: Interior structural concrete less than 8 inches minimum thickness including interior floor slabs and curbs.
4. Class "D" Concrete:
    a. Maximum Aggregate Size for Fill on Metal Decks: 3/4-inch.
    b. Compressive Strength: 4000 psi 28 day strength with a maximum water to cementitious materials ratio of 0.45.
    c. Additive at Interior Slabs: Specified moisture barrier admixture added in accordance with manufacturer's written instructions.
5. Class "E" Concrete:
    a. Maximum Aggregate Size: 1 inch.
    b. Compressive Strength: 4000 psi 28 day strength with a maximum water to cementitious materials ratio of 0.45.
    c. Locations of Use: Tilt-up wall panels.
    d. Batch plant inspection by Testing Laboratory is mandatory.

B. Slump Limits: Provide concrete, at point of final discharge, of proper consistency determined by Test Method ASTM C143/C143M, to meet the following slump values:

1. Class "A": 4 inches plus or minus 1 inch.
2. Class "B": 4 inches plus or minus 1 inch.
3. Class "C": 3 inches plus or minus 1 inch.
4. Class "D": 4 inches plus or minus 1 inch.
5. Class "E": 3 inches plus or minus 1 inch.

C. Mix Design:

1. Concrete shall be designed for strength in accordance with provisions of CBC, Section 1903A.
2. Should the Contractor desire to pump any of the concrete mix designs, a modified mix design will need to be submitted for review.
3. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of cement weight.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify the Following:

1. Requirements for concrete cover over reinforcement.
2. Anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, securely positioned, and will not impede placement of concrete.
3. Slab depressions, slopes for drainage, and other features shown on the Drawings are identified and accommodated.
4. Adjacent finish surfaces are protected during the concrete pour and finishing.
5. Formwork is tight and leak-proof before concrete is poured.
6. Condition of below-grade vapor retarder.

3.2 PREPARATION

A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.

B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.

C. Before placing concrete, clean tools, equipment and remove debris from areas to receive concrete.

D. Clean reinforcing and other embedded items of coatings and soil that may impair bond with concrete.

E. Slab-On-Grade:

1. After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown.
2. Rock base shall be implemented and consolidated in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.
3. Install vapor retarder above drainage rock base below enclosed spaces in accordance with manufacturer's recommendations and as specified in Section 07 2616, Below-Grade Vapor Retarder.

3.3 APPROVAL OF FORMS AND REINFORCEMENTS

A. Forms and reinforcements are subject to approval by the Project Inspector, and notice of readiness to place first pour shall be given to DSA, Architect and Structural Engineer not less than 2 business days prior to placement of concrete.

3.4 APPLICATION OF WATERSTOPS

A. Hydrophilic Waterstop:

1. Concrete surfaces must be clean and free of all contaminants. Remove all debris and loose concrete.
2. On irregular concrete faces, apply a 1⁄2-inch bead of adhesive as a bedding.
3. Secure waterstop strips using masonry nails 1-1⁄2 to 2 inches long with a washer 3⁄4-inch in diameter spaced at a maximum of 12 inch centers with a minimum spacing that ensures proper contact to substrate.

4. Joints in strips shall overlap a minimum of 4 inches with full contact between jointed pieces.
5. Damaged sections should be removed and repaired with new strips prior to pouring concrete.
6. Comply with additional installation instructions of the manufacturer.

B. Flexible Waterstops:

1. Install prior to concrete placement to ensure proper positioning and concrete consolidation around the waterstop.
2. Transitions, intersections, and splices should be heat welded to maintain continuity.
3. Use factory made fabrications for intersections and changes of direction.
4. Transitions, intersections, and splices shall be heat welded in compliance with the manufacturer's Installation guidelines.
5. Comply with additional installation instructions of the manufacturer.

3.5 CONCRETE DELIVERY

A. Mix concrete until there is uniform distribution of material and mass is uniform and homogenous. Mixer must be discharged completely before the mixer is recharged.

B. Concrete shall be Ready-Mix Concrete:

1. Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301.
2. Continuous Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, with approval by Structural Engineer of Record, approval by DSA, and the following:
   a. Approved Testing Laboratory shall check the first batching for each class of concrete and furnish mix proportions to the Licensed Weighmaster.
   b. Licensed Weighmaster to identify materials as to quantity and to certify each load by ticket.
   c. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt and will transmit two copies of record to DSA.
   d. Do not add water at the site to concrete mixes with a maximum specified WCR unless the water content at batch time provides for a WCR less than specified and this provision, including the quantity of water which may be added at the site, is specifically noted on the Mix Design and Certification by the mix preparer.

3.6 PLACING OF CONCRETE

A. General:

1. Place concrete on properly prepared and dewatered sub-grade or forms.

2. Do not begin placing concrete when the sun, heat, wind, or limitations of facilities furnished by the Contractor prevent proper consolidation, finishing and curing.
3. Do not begin placing concrete during precipitation unless adequate protection is provided. Do not allow rainwater to increase mixing water or to damage the surface of the concrete.
4. Do not place concrete until the Architect approves required Action Submittals.
5. Do not allow mud or foreign materials into the concrete during placement operations.
6. Project Inspector may order removal of equipment used for handling and mixing concrete which is insufficient or in any way unsuitable.

B. Conveying:

1. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients.
2. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work.
3. Concrete shall not be wheeled directly over the top of reinforcing steel.

C. Depositing:

1. Once started, continue concrete pour continuously until section is complete between predetermined construction joints.
2. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area.
3. Free fall of concrete shall not exceed 4 feet in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.
4. Remove form spreaders as placing of concrete progresses.
5. Place footings as monolithic and in one continuous pour.
6. Keep excavations free of standing water.

D. Consolidating: Concrete shall be consolidated by mechanical vibrators.

1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
2. Vibrating shall not be applied to concrete which has already begun to initially set nor shall it be continued so long as to cause segregation of materials.

E. Concrete Slabs:

1. Slabs shall be formed and finished to required line and grades.
2. Depress areas of interior floor slabs where required for shower stalls, walk-in refrigerators and freezers, door frames, tile, wheelchair lifts and other equipment and as noted on the Drawings.
3. Slope slab to floor drain where indicated on the Drawings.
4. Tolerances: As specified.

F. Conduit, plumbing lines and other embedment shall not be located in wall panels except where specifically detailed on the Structural Drawings.

G. Placement – Elevated Structural Systems:

1. Metal Decking and Structural Steel Beam Systems that are Not to be Shored:
   a. Locate screed lines on primary structural members.
   b. Review proposed screed line locations and expected structural deflections with the Architect prior to placement of concrete.
2. Screed Lines:
   a. Place screed lines to match camber of primary girders made of material other than concrete.
   b. Locate screeds to provide the minimum specified thickness of concrete at all locations.
3. Adjust embedded items to compensate for camber and deflection. Maintain locations within specified tolerances.
4. Elevated slabs shall be level, true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness. Finished slabs that do not meet the specified criteria may require the application of self-leveling hydraulic cement underlayment at the discretion of the Architect.

3.7 JOINTS

A. Horizontal Construction Joints:

1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.
3. Saw Cut Control (Contraction) Joints in Slabs-on Grade: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 1/8-inch thick blade and cut at least 1-inch deep but not less than one quarter (1/4) the depth of the slab unless otherwise indicated on the drawings. Locate control joints a maximum of 30 times the slab thickness in each direction. Limit the ratio of control joint spacing for each direction to 1:1.25.
   a. See layout on the Drawings or, if not shown, as approved by Architect.
   b. Clean dust and debris from saw cut joints.
   c. Unless otherwise noted, joints are to be filled with epoxy joint filler.

B. Saw Cutting:

1. General:
   a. Saw cutting must be performed before concrete begins to cool, within 4 to 12 hours after placing.

b. Do not make saw cuts if aggregate separates from cement paste during cutting operations.

c. Prevent marring of surface finish. Fill with flexible sealant.

2. Saw Type: "Mongoose" by Engrave-A-Crete or equal capable of producing the required results.

a. Blade Type and Speed: Diamond at 11,000 RPM and exceeding normal speed of 9,000 RPM.

b. Blades shall be changed for each Room.

3.8 CONCRETE FINISHING

A. General:

1. Finish slab as required by ACI 302.1R.
2. Use manual screeds, vibrating screeds or roller compacting screeds to place concrete level and smooth. Do not use "jitterbugs" or other special tools designed for the purpose of forcing the course aggregate away from the surface leaving too thick a layer of mortar.
3. While concrete is still wet but sufficiently hardened to bear a person's weight on knee boards, wood float surface to a true and even plane. Use sufficient pressure to bring moisture to surface and push course aggregate to just below surface.
4. After surface moisture has disappeared, float to true surface and finish utilizing steel trowel. Surface shall be free from trowel marks, depressions, ridges or other blemishes, be acceptable to finish flooring applicators, and meet specified tolerances for flatness and levelness.

3.9 SCHEDULE OF FINISHES

A. Interior Slabs - Smooth Finish:

1. Typical finish to be used at interior slabs to receive applied floor finishes including resilient flooring, wood flooring, and resilient stair coverings.
2. Use also at colored concrete floors and slabs to be left exposed and sealed with heavy duty concrete sealer.

B. Interior Slabs - Medium Broom Finish:

1. Typical finish to be used at interior slab locations to receive ceramic or quarry tile, and other finish materials specified to be installed over substrate with a roughened surface.
2. Use also at locations where slab will be left exposed and will not be colored or sealed, including ramps. At ramps, brooming direction shall run perpendicular to slope to form non-slip surface.

C. Exposed Concrete Surface Finishing Other than Slabs:

1. Remove fins and rough spots immediately following removal of forms from concrete which is to be left exposed.

2. Damaged and irregular surfaces and holes left by form clamps and sleeves shall be patched with grout.
3. Tie wires are to be removed to below exposed surface and holes pointed up with neat cement paste similar to procedure specified for patching under noted under Article “Defective Concrete.”
    a. Removal of tie wires shall extend to distance of 2 inches below established grade lines.
    b. Ends of tie wires shall be cut off flush at all other, unexposed locations.
    c. Care shall be taken to match adjacent finishes of exposed concrete surface.
4. After patching, concrete that is to remain exposed shall be sacked with a grout mixture of 1-part cement, 1-1/2-parts fine sand and sufficient water to produce a consistency of thick paint.
    a. After first wetting the concrete surface, apply mixture with a brush and immediately float entire surface vigorously using a wood float. Keep damp during periods of hot weather.
    b. When set, excess grout shall be scraped from wall with edge of steel trowel, allowed to set for a time, then wiped or rubbed with dry burlap.
5. Entire finishing operation of any area shall be completed on the same day.
6. Treatment shall be carried to 4 inches below grade, and patching and sacking shall be done immediately upon removal of the forms.

D. Stair Treads and Risers:

1. Tool stair tread and landing nosings to meet slip-resistant and accessibility requirements in the CBC and as detailed.
2. Nosings shall contain no pockets, voids or spalls.
3. Patching is not allowed. Damaged nosings shall be replaced.

E. Curbs:

1. Typical: Smooth steel trowel as specified for slabs.
2. Exposed:
    a. Tool edges after initial floating with an edging tool to a 1/4-inch radius, unless otherwise shown.
    b. Repeat tooling of edges after applying surface finishes.
    c. Eliminate tool marks on concrete surfaces.

3.10 SURFACE TOLERANCES

A. General:

1. Conform to requirements of ACI 302.1R and as specified.
2. Finish troweled slab surfaces to the following specified overall value and minimum local value tolerances for a randomly trafficked floor surface in accordance with ASTM E1155.
3. Designing for nominal increases in concrete slab thicknesses will be required for concrete slabs on metal deck on structural steel framing to achieve compliance as

levelness tolerances will require screeding between points set at adjacent columns, rather than providing a constant concrete thickness above steel beams.

B. Typical Slabs-on-Grade and Elevated Slabs:

1. Floor Flatness and Levelness:
   a. Floors slabs shall conform to the following ACI F-number requirements when measured in accordance with ASTM E1155:

	Flatness F_F	Levelness F_L
1) Floors Receiving Thinset Tile or Resilient Flooring:		
Specified Overall Value:	35	25
Minimum Local Value:	30	24
2) Polished Concrete Floors:		
Specified Overall Value:	35	25
Minimum Local Value:	30	24
3) Floors Receiving Carpet:		
Specified Overall Value:	25	20
Minimum Local Value:	17	15
4) Noncritical Floors (Utility Rooms, Below Raised Floors):		
Specified Overall Value:	20	15
Minimum Local Value:	15	10
5) Concrete Fill on Metal Deck:		
Specified Overall Value:	35	25
Minimum Local Value:	24	17

2. Flatness of inclined, cambered or shored, elevated construction after shoring has been removed shall be finished to a straightedge value at any point not to exceed 3/16-inch in 10 feet for typical areas and shall not exceed 1/8-inch in 10 feet for areas to receive thinset tile or resilient flooring.

C. Slabs not listed with an F(F) or F(L) rating shall be true, level and flat with a maximum tolerance of 1/8-inch in 10 feet above or below the grade lines.

D. Sloping slabs shall slope evenly and true from one grade point to the next with the same 1/8-inch in 10 feet requirements.

3.11 CURING

A. Concrete in Forms:

1. Keep forms and top on concrete between forms continuously wet until removal of forms.
2. Maintain exposed concrete in wet condition for 14 days following removal of forms.

B. Do not subject concrete to design loads until concrete is completely cured, and until concrete has attained its full specified 28 day compressive strength or until 21 days after placement, whichever is longer.

C. Interior slabs shall be cured utilizing a wet curing blanket.

1. For slabs utilizing a moisture barrier admixture within the concrete mix, Contractor must confirm with admixture manufacturer that the wet curing blanket may be omitted.

3.12 SURFACE TREATMENTS AND SEALERS

A. General: Apply surface treatments and sealers in accordance with manufacturer's recommendations and written instructions.

B. Application of Color Hardener:

1. Apply color hardener evenly to wet plastic surface by dry-shake method.
   a. Rate: 60 pounds per 100 square feet.
   b. Apply in two shakes.
2. Wood float after each shake, and smooth trowel after final floating until surface is free of trowel marks and uniform in texture and appearance.
3. Protect adjacent paving and planting areas during the coloration process.

C. Application of Surface Retarder:

1. Apply specified surface retarder uniformly to wet concrete after the initial bleed water rises to the surface using low pressure spray equipment in accordance with manufacturer's recommendations.
2. Allow treated concrete to cure at least 12 hours.
3. Remove retarded cement matrix with low-pressurized water or broom to expose aggregate uniformly.
4. Perform cement matrix removal in a continuous operation, utilizing the same work crew to maintain continuity of finish on each surface area of work.
5. Exercise care, and install protective procedures, to prevent rinse water from damaging adjacent materials.
6. Retarder that has not been in contact with the concrete should be neutralized with cement slurry or soda solution before removal.

3.13 WATER REPELLENTS AND GRAFFITI-RESISTANT COATINGS

A. Prepare concrete to receive water repellent in accordance with Section 07 1900, Water Repellents, and graffiti-resistant coating per Section 09 9623, Graffiti-Resistant Coatings, where indicated.

3.14 DEFECTIVE CONCRETE

A. Defective concrete is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.

3. Concrete which contains rock pockets, voids, spalls, cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete finish exhibiting excessive shrinkage, cracking, crazing or curling.

B. Repair or Replacement of Defective Concrete:

1. Requirements for repair or replacement of defective concrete will be determined by Architect.
2. Patching:
   a. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
   b. Install specified patching mortar in accordance with manufacturer’s recommendations.
   c. Repairs to defective concrete which affect the strength of structural concrete member or component are subject to approval by the Architect and DSA.
   d. Permission to patch an area shall not be considered waiver of right, by the Owner, to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.
3. Repair damaged and defective work and eliminate functional and visual defects.
   a. Where repair is not possible, cut out and replace defective concrete.
   b. Adjust joints for uniform appearance.
4. Defective concrete shall be removed from the site.

C. In addition to determination of defective conditions by the Architect, the Owner reserves the right to survey the slabs for flatness and levelness to determine if the slabs are outside of the maximum tolerance. If the slabs are found to be out of tolerance, the following will apply:

1. Contractor will be required to bring the slabs to within tolerance by either grinding and filling or replacing the slab.
2. Repair methods proposed by the Contractor must be acceptable to the Owner and Architect.
3. The Contractor will be responsible for reimbursing the Owner for any surveying costs incurred.
4. Determination of slab flatness, surveying and any remedial work must be completed far enough in advance of the scheduled date for installation of the floor finishes so that the project schedule is maintained, delays are avoided and the new slabs or slab repairs are properly cured.

3.15 GROUTING UNDER COLUMN BEARING PLATES

A. Mix grout in accordance with the manufacturer's instructions using a little water as possible but to a consistency which will permit placement.

B. Place grout in accordance with manufacturers' recommendations.

C. Place grout so as to ensure complete bearing and elimination of air pockets.

3.16 FIELD QUALITY CONTROL

A. Flatness and Levelness Testing:

1. There will be initial or preliminary inspection of the finished concrete slabs by the Project Inspector and Architect for levelness and flatness.
2. If deemed necessary, Interior slabs on grade, elevated slabs and concrete placement requiring an F(F) and/or F(L) rating by these Specifications or the Drawings may be tested and surveyed in accordance with the requirements of ASTM E1155 by the Owner's independent testing agency.
3. If it is determined that floors not meeting the flatness criteria is due to means and methods fully within the control of the Contractor, the cost of the survey will be back charged to the Contractor. Failure includes, but is not limited to, the erection of steel and metal deck outside industry tolerances and referenced standards.

B. Concrete Strength Testing: Comply with CBC Sections 1705A.3, 1903A, 1904A, and as specified in this Section. Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

1. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
2. Strength tests will be conducted by the Testing Lab on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
3. On a given project, if the total volume of concrete is such that the frequency of testing required in Subparagraph 1 above would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.

C. Moisture and PH Testing of Concrete Slab-On-Grade and Above-Grade Concrete, Scheduled to Receive Floor Finish Material: Comply with requirements specified in Section 01 4520, Concrete Floor Moisture Content and PH Testing.

D. Concrete Permeability Testing:

1. Permeability testing must be conducted following ASTM D5084 and/or ASTM ASTM D4263 guidelines after a minimum of 30 days of concrete cure time.
    a. ASTM D5084 Testing: The permeability rate to be no less than 10-7 on the Darcey scale.
    b. ASTM D4263 Testing: If any moisture condensation or observable darkening of concrete color is present at completion of testing procedure, the slab is not ready for a moisture-sensitive floor covering installation.
    c. In the event that any section of the cured concrete fails the permeability testing, the Contractor shall apply a topical vapor barrier by the manufacturer of the specified Moisture barrier admixture, to the extent necessary and as approved by the Architect, to mitigate the excess moisture at no additional cost to the Owner.
2. Testing Laboratory Requirements: The Contractor or its Subcontractors may not conduct testing for concrete slab permeability. These tests shall be provided by the Contractor through an independent third party testing laboratory.
3. Provide access for and cooperate with the approved independent third-party testing lab.
4. Following testing, the test results must be submitted to the Contractor, Architect, Owner, and flooring installer a minimum of 10 business days prior to scheduled installation date of flooring. Installation of flooring at tested areas may not begin without Architect's review and approval of the testing results.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Clear sealer applied to cured concrete at exposed interior concrete slabs and toppings.

1.2 RELATED REQUIREMENTS

A. Section 01 4520, Concrete Floor Moisture Content and PH Testing.

B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

C. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

D. Cast-in-Place Concrete: Section 03 3000; finishing of concrete prior to final curing.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. ASTM International (ASTM):

1. E303: Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.5 COORDINATION

A. General:

1. Coordinate with Section 03 3000, Cast-in-Place Concrete, for concrete mixes, aggregates, surface tolerances, textures, and acceptable methods of curing concrete to receive specified stains and sealers including use of surface retarders.
2. Coordinate finishing of exposed concrete flatwork.
3. Protect to prevent damage by impact or stains from rubbish and the work of other trades during concrete curing period and prior to application of stains and sealers. Application of stains and sealers to a contaminated concrete surface is not acceptable.

1.6 ACTION SUBMITTALS

A. Product Data: Manufacturer's specifications, application instructions, and general recommendations. Include:

1. Instructions and recommendations for cleaning and preparation of surfaces.
2. Coating application techniques.
3. Equipment to be used.
4. Coverage rates.
5. Protection of adjacent materials.
6. Cleaning methods for overspray.

B. Samples:

1. Each specified sealer, in selected gloss and specified slip resistance, applied in step fashion to suitable substrate.
   a. Samples shall be a minimum 24 inches by 24 inches.
   b. Samples shall be prepared to demonstrate a range of gloss levels within general range selected by Architect.

1.7 INFORMATIONAL SUBMITTALS

A. Statement of qualifications for installer of stained concrete finishes.

B. Results of field testing for slip resistance.

C. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance instructions and list of recommended maintenance products for each finish system.

B. Guarantee: Submit Subcontractor's guarantee.

1.9 QUALITY ASSURANCE

A. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

B. Products shall be compatible with other specified products with which they may come in contact, including concrete release agents and applied coatings. Bring discrepancies promptly to the attention of the Architect, in writing.

C. Mockups: Provide mockups and test areas for each finish of concrete to verify surface preparation, wet and dry slip resistance, visual effect, sheen, and product application techniques.

1. Notify Architect 5 business days in advance of dates and times when mockups will be prepared.
2. Each mockup shall be of sufficient size for Architect to adequately evaluate concrete appearance and finishing but not less than 48 inches square.
3. Use same mix design and curing methods proposed for final installation.
4. Contractor shall provide up to 3 mockups for initial evaluation and approval.
5. Finish, sheen, texture, and general appearance shall match that of accepted samples and of control samples provided by Architect.
6. Maintain final accepted mockups in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mockups not approved for inclusion as part of the work when directed.

1.10 FIELD CONDITIONS

A. Protect exposed surfaces, including flat work, as required to prevent damage by impact or stains from rubbish and the work of other trades.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE REQUIREMENTS

A. Clear Penetrating Sealer:

1. Shall not darken, stain, or discolor substrate.
2. Shall be formulated for low-pressure application to concrete flatwork.
3. Shall be formulated to stop intrusion of water, salts, and de-icing chemicals.

B. Sustainable Design:

1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 SURFACE TREATMENTS

A. Clear Sealer at Exposed Interior Concrete Flatwork not Stained or Scheduled to Receive an Applied Floor Covering: Water based, VOC compliant, “Carefree Floor Finish/Sealer” by Diversey Inc., or equal meeting specified slip-resistance requirements.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION PRIOR TO SEALING

A. Surfaces shall be cleaned and free of gypsum board sanding dust, joint treatment droppings, paint, grease, oil, and other foreign matter which would prevent necessary penetration and subsequent reaction of the stain solution with concrete surface.

B. Comply with sealer manufacturer's recommendations for methods to be used for cleaning each type of contaminant.

C. Test for moisture content as specified in Section 01 4520, Concrete Floor Moisture Content and PH Testing, to ensure that surface is sufficiently dry.

3.2 APPLICATION OF CLEAR SEALER AT INTERIOR CONCRETE FLATWORK

A. Locations of Use:

1. Exposed concrete slabs not scheduled to receive an applied floor finish, unless otherwise indicated.

B. Apply specified sealer using a low-pressure, non-atomizing spray applicator or by pouring followed by a squeegee or a broom for even distribution in accordance with manufacturer's instructions and as follows.

1. Apply uniformly and with sufficient material for surface to remain wet for 30 to 60 seconds before penetrating.
2. Broom out puddles until they penetrate the surface.

C. If prepared surface is extremely porous and if recommended by manufacturer, apply a second coat after first coat has completely penetrated surface and initial surface drying of first coat has become visible. Apply second coat in a direction 90 degrees from the first coat.

D. A lambswool applicator should be used for small areas.

E. Allow material to cure at least 4 hours before allowing any traffic on surface.

3.3 CLEANING

A. Clean spillage from adjoining surfaces immediately after spillage while still wet. Comply with manufacturer's recommendations for cleaning.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural steel fabrication and erection.
2. Shop-applied coatings.
3. Galvanizing.

1.2 RELATED REQUIREMENTS

A. Section 01 4523, Testing and Inspection Services.

B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

C. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

D. Section 03 1000, Concrete Forming and Accessories.

E. Section 03 2000, Concrete Reinforcing.

F. Section 03 3000, Cast-In-Place Concrete.

G. Section 09 9100, Painting.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. American Institute of Steel Construction (AISC):

1. Steel Construction Manual.
2. ANSI/AISC 303: Code of Standard Practice for Steel Buildings and Bridges.
3. ANSI/AISC 360: Specification for Structural Steel Buildings.

D. American Welding Society (AWS):

1. ANSI/AWS D1.1/D1.1M: Structural Welding Code-Steel.

E. ASTM International (ASTM):

1. A6/A6M: Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.

2. A36/A36M: Standard Specification for Carbon Structural Steel.
3. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
4. A108: Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
5. A123/A123M: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
6. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
7. A307: Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
8. A385/A385M: Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
9. A500/A500M: Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
10. A563: Standard Specification for Carbon and Alloy Steel Nuts.
11. A572/A572M: Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
12. A780/A780M: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
13. A992/A992M: Standard Specification for Structural Steel Shapes.
14. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
15. F436/F436M: Standard Specification for Hardened Steel Washers Inch and Metric Dimensions.
16. F959/F959M: Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series.
17. F1554: Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
18. F3125/F3125M: Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.

F. National Association of Corrosion Engineers (NACE/SSPC): The Society for Protective Coatings (SSPC):

1. Surface Preparation Specifications:
    a. SSPC-PA 1: Shop, Field, and Maintenance Painting of Steel.
    b. SSPC-SP 2: Surface Preparation Specification No. 2: Hand Tool Cleaning.
    c. SSPC-SP 3: Power Tool Cleaning.
    d. NACE No. 3/SSPC-SP 6: Joint Surface Preparation Standard: Commercial Blast Cleaning.
    e. NACE No. 2/SSPC-SP10: Joint Surface Preparation Standard: Near-White Metal Blast Cleaning.

G. Research Council on Structural Connections (RCSC): RCSC 1, "Specification for Structural Joints Using High-Strength Bolts."

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Pre-Installation Meeting: Schedule a job meeting to review the Structural Documents prior to development of shop drawings. The meeting shall be attended by all pertinent parties, which is, at a minimum, to include the fabricator, erector, contractor, Owner's Testing Agency and Project Inspector, **[Architect,]** and Structural Engineer.

C. Scheduling and Sequencing:

1. Organize the work and employ shop and field crew(s) of sufficient size to minimize inspections by the Testing Agency.
2. Provide schedule and sequence information to Testing Agency in writing upon request. Update information as work progresses.

D. Coordination:

1. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Submit showing parts, connections and anchorages, adjacent materials, fully dimensioned and noted.

1. Show shop and erection details including cuts, copes, connections, holes, threaded fasteners, rivets, and welds. Indicate profiles, sizes, spacing, and locations of structural members, openings, and attachments.
2. Show welds, both shop and field, by the currently recommended symbols of the American Welding Society.
3. Shop drawings shall not be made by using reproductions of Contract Drawings.
4. Provide the following as separate and complete submittals for each building. Architect approval is required if individual building submittals are desired to be phased.
    a. Bolt and anchor setting plans.
    b. Layout, fabrication and erection drawings.

B. Product Data: Submit list and complete manufacturer's descriptive data of products proposed for use. Include manufacturer's specifications, installation instructions, and maintenance instructions.

C. Samples:

1. Material samples as requested by the Owner's Testing Agency as specified in Article SOURCE QUALITY CONTROL at no additional costs.

D. Welding Procedure Specifications:

1. Prequalification of WPSs (Welding Procedure Specifications) shall be defined as exemption from the WPS qualification testing required in AWS D1.1/D1.1M, Section 4.
   a. Prequalified WPSs to be used shall be prepared by the manufacturer, fabricator or Contractor as written prequalified WPSs.
   b. After the "Testing Laboratory" has reviewed submitted prequalified WPSs for conformance to the Contract Documents and AWS D1.1/D1.1M, Section 3, file two record copies with the Architect.
   c. WPSs that do not conform to the requirements of Section 3 may be qualified by tests in conformance with AWS D1.1/D1.1M, Section 4; testing paid for by the Owner and backcharged to the Contractor.
2. Welding procedures for both shop and field welds, which are deemed prequalified in accordance with AWS D1.1/D1.1M, Section 4, shall be prepared as written procedures and shall be submitted for approval to Owner's Testing Agency, DSA and Structural Engineer of Record prior to commencement of fabrication.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: Submit for the following.

1. Steel fabricator.
2. Steel erector.
3. Welders.

B. Certificates:

1. Structural Steel: Two certified copies of mill test reports indicating physical and chemical properties of steel used.
   a. Correlate individual heat numbers with each specified section and location. Unsatisfactory mill test reports, treat as unidentifiable material.
   b. Provide Contractor's affidavit certifying that all identified steel materials provided are of the grades specified and match the certificates supplied.
2. High Strength Bolts: Two certified copies of inspection test reports for each production lot indicating proof load, tensile strength (wedge test), and hardness. Unsatisfactory test reports will result in the bolts being rejected.
3. Welded Studs: Two certified copies of in-plant quality control mechanical tests.

4. Welders Certificates: Certify welders employed on the Work verifying AWS qualification within the previous month.

C. Record of Pre-Installation Meeting.

D. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Qualifications:

1. Steel Fabricator: Not less than five years continuous experience in the fabrication of structural steel.
2. Steel Erector: Not less than five years continuous experience in the erection of structural steel.
3. Welding:
   a. Welding shall be performed by operators who are qualified as prescribed in "Qualification Procedure" of AWS D1.1/D1.1M of the American Welding Society.
   b. Welders whose work fails to pass inspection shall be requalified before performing further welding.
   c. Welding shall be performed only under Fire Marshal permit as required by local jurisdiction.

B. Use only new materials and products, unless existing materials or products are specifically shown on the Drawings to be salvaged and re-used.

C. Single Source Responsibility: Use materials and products of one manufacturer whenever possible.

D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

E. Certification and Identification of Materials and Uses:

1. General:

a. Provide Testing Agency with access to fabrication plant to facilitate inspection of steel.

b. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection and material identification/test information listed below.

2. Test steel as required by ASTM A6/A6M.

3. Provide manufacturer's Mill Test Reports for materials.

a. Include chemical and physical properties of the material for each heat number manufactured.

b. Tag fabricated materials with heat number.

4. Provide letter certifying materials supplied are from heat numbers covered by supplied mill certificates. Include in letter the physical location, such as walls, braced frames, or other identifiable description, of each material type and/or heat number in the project.

5. Unidentified Material Tests: Where identification of materials by heat number to mill tests cannot be made, Owner's Testing Agency will test unidentified materials.

6. Provide certification, verifications, and other test data required to substantiate specified material properties at no additional cost to the Owner.

F. Testing and Inspection:

1. Tests and Inspections performed by Independent Testing Agency are specified below in Articles SOURCE QUALITY CONTROL and FIELD QUALITY CONTROL.

a. Duties and limitations of Independent Testing Agency, test costs and test reports in conformance with applicable Sections of Division 01.

b. The Testing Agency will review all submittals and testing of materials.

G. The following standards are the minimum level of quality required. Provide higher quality work as specifically indicated in the Contract Documents.

1. Workmanship and details of structural steel work shall conform to the CBC and ANSI/AISC 360.

2. The quality of materials and the fabrication of welded connections shall conform to the American Welding Society, AWS D1.1/D1.1M - Structural Welding Code.

H. Testing and inspection shall be in accordance with CBC, Chapter 17A, and Chapter 22A.

I. Conflicting Requirements: In the event of conflict between governing codes and regulations and the requirements of the referenced standards or these Specifications, the provisions of the more stringent shall govern.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.

C. Transport, store and handle in strict accordance with manufacturer's written recommendations.

D. Protection: Use all means necessary to protect structural steel before, during and after installation and to protect the installed work and materials of all other trades.

E. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

1.10 FIELD CONDITIONS

A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Sustainable Design:

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

2.2 STEEL SHAPES AND PLATES

A. Steel Shapes, Bars, and Plates: Meet ASTM A36/A36M, unless noted otherwise.

B. Steel W and WT Shapes: Meet requirements of ASTM A992/A992M.

C. Miscellaneous steel shapes including S, ST, M, MT & HP channels, and angles shall meet the requirements of ASTM A36/A36M.

2.3 HOLLOW STRUCTURAL SHAPES (HSS)

A. Square and Rectangular HSS: Meet the requirements of ASTM A500/A500M Grade B, 46 ksi minimum yield strength.

B. Round HSS: Meet the requirements of ASTM A500/A500M, Grade B, 42 ksi minimum yield strength.

2.4 PIPE COLUMNS

A. Pipe columns shall meet the requirements of ASTM A53/A53M, Type S, Grade B, 35 ksi minimum yield strength.

2.5 BOLTS, NUTS AND WASHERS

A. High Strength bolts:

1. High strength bolts, nuts and washers shall meet the requirements of ASTM F3125/F3125M, Type 1.

2. Use high strength bearing bolts for all bolted steel-to-steel connections unless otherwise indicated on the drawings. Use high strength slip critical bolts when indicated on Drawings.
3. Bolts and nuts for high strength shall be heavy hex head conforming to ANSI Standards B18.2.1 and B18.2.2 respectively. Nuts shall conform to ASTM A563.
4. Washers shall be circular, flat and smooth and shall conform to requirements of Type A washers in ANSI Standard B23.1. Washers for high strength bolts shall be hardened and conform to ASTM F436/F436M, Specification for Hardened Steel Washers. Beveled washers for American Standard Beams and channels shall be square or rectangular, shall taper in thickness (16-2/3 percent slope) with average thickness of 5/16-inch.
5. Direct tension or load indicator washers conforming to AISC specifications for Structural Joints and requirements of ASTM F959/F959M.
    a. Direct Tension Indicating Washers: J.M. Turner, Inc., or equal.
    b. Load Indicating Washers: Beta Fast, or equal.
6. Bolts shall be new and shall not be reused.
7. Bolts shall be well lubricated at time of installation. Dry, rusty bolts will not be allowed. Bolts or nuts shall be wax dipped by bolt supplier or "Johnson's Stick Wax 140" shall be used with bolts in shop or field.

B. Machine Bolts and Anchor bolts: Machine bolts shall meet the requirements of ASTM A307, and anchor bolts shall meet the requirements of ASTM F1554, Grade 36, unless noted otherwise. Upset threads are not allowed.

C. Welded Studs: Studs shall be manufactured of grade 1015 cold-drawn steel which conforms to ASTM A108: shear connector type, styles, and sizes shown; headed with welding end fluxed for automatic welding; “Nelson” Granular Flux-filled Shear Connector, “Anchor Studs”, or equal.. Threaded studs shall have cut threads, no upset threads allowed.

D. Drilled-in Anchors:

1. At Concrete: Hilti “Kwik Bolt TZ” (ICC Report No. ESR-1917), or equal.
2. At Masonry: Hilti “Kwik Bolt 3” (ICC Report No. ESR-1385), Ramset T3 (ICC Report No. ESR-1955), or equal.
3. Anchors at exterior work shall be stainless steel.
4. Testing of anchors is required.

E. Washers:

1. Lock-Washers: ANSI B27.1; helical spring type, carbon steel; medium series.
2. Hardened Steel Washers: ASTM F436/F436M.
3. Load-Indicator Washers: ASTM F959/F959M.

F. Bearing Pads: Neoprene bearing pads with 70 durometer hardness by DuPont, or equal.

2.6 GROUT

A. Nonmetallic Shrinkage-Resistant Grout: Premixed, nonmetallic aggregate type,, noncorrosive, nonstaining shrinkage-compensating, complying with ASTM C1107/C1107M, and capable of developing minimum compressive strength of 7,000 psi at 28 days; Master Builders Solutions “MasterFlow 928" by BASF, or equal.

2.7 FABRICATION

A. General:

1. Fabricate structural steel in strict accordance with the approved Construction Documents and the referenced standards.
2. Protect materials, before and after fabrication, from rust, corrosion, dirt, grease and other foreign matter.
3. Fabricate framing members free from twists or bends. Form holes, cut and sheared edges neatly without kinks, burrs, or warped edges.

B. Holes, Cutouts, and Fittings:

1. General:
   a. Provide where shown on Structural Drawings and steel shop drawings. No additional holes, cutouts, or fittings permitted without written permission.
2. Bolt Holes: Bore holes same diameter as bolt shank plus 1/16-inch except at column base plates attaching to concrete foundations.
   a. Bolt holes in such column base plates may be the bolt shank plus 3/16-inch with standard nuts or the bolt shank plus 5/16-inch with heavy hex nuts.
   b. Use slotted or oversize holes only where specifically indicated on the Drawings.

C. Camber: Fabricate beams and girders with natural camber upward, unless otherwise noted.

2.8 WELDING

A. General:

1. For details of joints, comply with requirements for AWS joints accepted without qualification tests.
2. Prequalified joint welding procedures to be used shall be prepared by fabricator/erector as written procedures and shall be submitted for examination as specified in Part 1.
3. The type and capacity of the welding equipment shall be in accordance with the manufacturer’s recommendations and shall be checked and approved by a welding inspector.
4. Follow applicable section of AWS specifications.
5. Requirements for workmanship and technique shall be as specified in AWS Code Sections 3 and 5, including preheat and interpass temperatures, in accordance with Table 3.2 for process being used.

6. No combination of bolts and welds shall be used for stress transmission in same faying face of any connection.
7. Groove welds made in shop fabrications shall be terminated at ends of a joint by use of extension bars or run-off plates.
    a. Extensions shall be removed flush with base material edge.
    b. Weld dams are not allowed.
8. Intermittent and continuous welding, and straightening of built-up sections, shall be done in manner to minimize internal stresses.
9. Welds not specified shall be continuous fillet welds, sufficient to transmit required forces, using minimum fillet as specified by AWS D1.1/D1.1M.

B. Welding shall be limited to following processes:

1. Shielded Metal Arc Welding (SMAW).
2. Flux-cored Metal Arc Welding (FCAW).
3. Gas Metal Arc Welding (GMAW; short circuiting transfer not permitted).
4. Submerged Arc Welding (SAW) may be used for shop welding.

C. Electrodes shall be in accordance with AWS D1.1/D1.1M for welding process used.

1. Electrodes shall be applicable types and classes for prequalified joints:
    a. FCAW filler metal wire shall be limited to 5/64-inch diameter maximum.
    b. SMAW welding electrodes shall be limited to 5/32-inch diameter maximum.
2. Strength: AWS E70 or equivalent, except no E70T-4 allowed.
3. Weld beads shall not exceed 1/2-inch in width, weave beads prohibited.

D. Complete Penetration Welds: Complete penetration groove welds made with use of steel backing bars shall have weld metal thoroughly fused with backing bar.

1. Backing bar shall be continuous for full length of weld.
2. These bars shall be removed after welding and weld shall be back gouged and weld replaced in sufficient quantity to obtain smooth contour.
3. Groove welds shall be made with stringer “passes only.” Wash passes will not be allowed.

E. Fillet welds terminating at ends or sides shall be returned continuously for distance at least twice normal size of weld (end returns).

F. Welded Studs: Comply with AWS procedure.

1. Studs:
    a. Furnish ASTM A307 Grade B Studs, with cut threads to attach wood nailer to steel, fillet welded to base metal.
    b. In lieu of ASTM A307 studs fillet welded to base metal, the Contractor may furnish “Nelson” type studs welded to the base metal with use of automatically timed stud welding equipment.
2. Preparation:

a. Clean areas to receive studs; remove mill scale, rust, oil, grease, and other foreign material, which may inhibit fusion.

b. Preheating is not required if fusion tests meet AWS requirements.

c. Provide one extra test stud per 50 studs welded for the automatically end-welded stud process.

3. The studs shall be automatically end welded in accordance with the manufacturer's recommendations in such a manner as to provide complete fusion between the end of the stud and the plate. There should be no porosity or evidence of lack of fusion between the welded end of the stud and the plate.

G. Inspections:

1. Welded Studs: Shop and field welding operations for the automatic end welded studs shall be inspected in accordance with AWS D1.1/D1.1M and CBC, Section 2213A.2 by a qualified welding inspector approved by DSA.

2. At the beginning of each day's work, a minimum of two test stud welds shall be made with the equipment to be used to metal which is the same as the actual work piece.

a. The test studs shall be subjected to a 90-degree bend test by striking them with a heavy hammer.

b. After the above test, the weld section shall not exhibit any tearing out or cracking.

H. Types of Welds, Unless Otherwise Noted:

1. Make fillet welds 3/16-inch minimum.

2. Make butt welds complete penetration welds.

3. Welds not required to be complete penetration are specifically noted on the Drawings.

2.9 GALVANIZING

A. Provide zinc coating for items exposed to exterior atmosphere, shown on the Drawings, or specified to be galvanized using the hot-dip process after fabrication into largest practical section and in accordance with ASTM A385/A385M.

1. Comply with ASTM A153/A153M for galvanizing of steel hardware including bolts and washers.

2. Comply with ASTM A123/A123M for galvanizing of rolled, pressed, and forged-steel shapes, plates, bars, and strips 1/8 inch thick and heavier.

3. Comply with ASTM A123/A123M for galvanizing of assembled steel products.

B. Weight of coating not less than 2 ounces per square foot of surface.

C. Passivation agents and other treatments that will interfere with paint adhesion are not permitted on galvanized metal that is to be shop primed or field painted.

D. Where damaged, repair surface with one coat of hot process galvanizing repair compound with a minimum 95 percent zinc-dust-content in dried film in accordance with ASTM A780/A780M; “ZRC Cold Galvanizing Compound” by ZRC Worldwide, or equal.

2.10 PROTECTIVE PAINT COATINGS

A. General:

1. Primers for structural steel shall be compatible with the finish coatings described in Section 09 9100, Painting.
2. Comply with local VOC limitations of authorities having jurisdiction and compatible with finish coats specified in other Sections.
3. Follow manufacturers printed instructions.
4. Apply one coat unless otherwise specified.

B. Coatings:

1. Type A: Modified alkyd, 2.0 to 3.5 mils DFT per coat; Series V10 by Tnemec, or equal.
2. Type B: Organic zinc-rich urethane, 2.5 to 3.5 mils DFT; “Tneme-Zinc” Series 90-97 by Tnemec, or equal.
3. Type C: Mio-zinc filled aromatic polyurethane, 2.5 to 3.5 mils DFT; “PerimePrime” Series 394 by Tnemec, or equal.

C. Shop Cleaning and Priming:

1. General:
   a. Unpainted Surfaces:
      1) Remove oil and grease with solvent cleaners; remove dirt and other foreign material by sweeping with wire brushes or other suitable means.
      2) Thoroughly clean steel to be encased in concrete.
   b. Painted Surfaces:
      1) Do not paint when ambient temperature is below 40 degrees F.
      2) Paint in dry weather or under cover.
      3) Clean off loose mill scale, oil, rust, slag burned material or foreign matter before painting.
      4) Avoid paint run, lap, sags or other defects in exposed work.
      5) Apply paint by brush or spray over dry dust-free surfaces in accordance with manufacturer’s directions.
      6) Do not thin paint in excess of manufacturer’s recommendations.
      7) Allow paint to dry before handling or shipment of structural steel.
2. Prepare and finish structural component surfaces as follows:
   a. Structural and Miscellaneous Steel for Interior Dry Exposure (Finish Painted or Unpainted):

1) Surface Preparation: SSPC-SP 2 or SP 3. Where jobsite exposure is expected to exceed 6 months, NACE No. 3/SSPC-SP 6 is required.
2) Apply Primer Type A, except as noted in subparagraph **[C.3]** below.

b. Structural and Miscellaneous Exterior Steel or Interior Steel Subjected to Wet Conditions or Fumes (Finish Painted)[, and AESS]:
1) Surface Preparation: SSPC-SP 6. For severe (immersion) exposure, NACE No. 2/SSPC-SP10 is required.
2) Apply Primer Type B, except as noted in subparagraph **[C.3]** below.

c. Structural Steel to Receive Fireproofing, Interior Perimeter Steel, Steel that will be Inaccessible after Erection, Steel to Receive High Performance Finish Coatings, and Slip Critical Bolted Connection Surfaces (Finish Painted or Unpainted):
1) Surface Preparation: SSPC-SP3.
2) Apply Primer Type C, except as noted in subparagraph **[C.3]** below.

3. Do not prime the following surfaces unless otherwise indicated:
a. Connections to be field welded. Keep painted surfaces 2 inches away minimum.
b. Steel in contact with or to be encased in concrete.
c. Surfaces to receive welded metal decking.
d. Galvanized items prior to completing connections.
e. Slip critical bolted connections.
f. Steel to be fireproofed.

4. Galvanized Steel:
a. Field prime with Type B after connections are complete.
b. Do not finish work until inspection is complete and work approved by Testing Agency.

2.11 SOURCE QUALITY CONTROL

A. General:

1. An independent Testing Agency will perform source quality control tests and submit reports, as specified in Section 01 4523, Testing and Inspection Services.
2. Costs in connection with shop fabricators, shop welding, and tests for structural steel will be paid by the Owner, except that costs of all reinspection of items which did not initially pass and testing of unidentified steel will be backcharged to the Contractor.

B. Steel Materials Testing:

1. Unidentified Steel- General: Test structural shapes.
2. In addition, test to verify Fy and Fu values when engineering requirements exceed Fy = 25 ksi for design.

C. Bolts, Nuts and Washers: Provide samples to Testing Agency for required testing.

D. Shop fabrication of steel trusses and steel braced frames shall be inspected in accordance with CBC Section 1704A.2.5 and 1704A.3. The Inspector shall furnish the Architect, Structural Engineer and the Division of the State Architect a report that the materials and workmanship conform to the approved Drawings and Specifications.

E. Testing and inspection of installed high strength bolts shall be in accordance with CBC Section 1704A.3.3 and 2213A.1.

F. End weld studs shall be tested in accordance with CBC Section 2213A.2.

G. Shop Welding Inspection:

1. General:
   a. Welding Inspector of the Owner's Testing Agency will inspect and certify structural welds, unless the fabricating shop has been accredited in conformance with CBC requirements, and submits certification to the Architect for review and the DSA for approval.
   b. Welding Inspector will verify that the welders are properly qualified prior to steel fabrication and state the qualifications of each welder in its welding inspection report.
2. Continuous inspection, complying with requirements of AWS D1.1/D1.1M, is required except as otherwise specified.
   a. Welding Inspector will check welds, materials, equipment and procedures.
   b. Welding Inspector will provide reports certifying the welding is as required and has been done in conformity with the Drawings, Specifications, and governing codes.
   c. Welding Inspector will use radiographic, ultrasonic, magnetic particle, or other necessary aid to visual inspection to assure adequacy of welds.

H. Periodic inspection is acceptable and will be performed by the Welding Inspector under the following conditions:

1. Single pass fillet welds not exceeding 5/16-inch.
2. Welding of studs to beams.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Surface Conditions:

1. Prior to installation of the work of this Section, carefully examine the installed work of other trades and verify that all such work is complete to the point where this installation may properly commence.
2. Verify that structural steel may be fabricated and erected in strict accordance with the original design, the approved shop drawings, and the referenced standards.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Architect.
2. Do not proceed with fabrication or installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 ERECTION

A. General:

1. Erect structural steel in strict accordance with the Drawings, and all pertinent regulations, unless otherwise noted.
2. Erection Tolerances: As specified.

B. Templates:

1. Provide bolt setting templates for anchor bolts.
2. Provide instructions for the setting of anchors and bearing plates.
3. Verify these items are set correctly as work progresses.

C. Column Base Plates: Set level to correct elevations, support temporarily on steel wedges, shims, or leveling nuts where shown, until the supported members are plumbed and grouted.

1. Grout solid the full bearing area under base plates prior to installation of concrete specified in Section 03 3000, Cast-In-Place Concrete.
2. Comply with manufacturer's instructions for non-shrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

D. Bolting:

1. Inspect mating surfaces to insure that bolt head and nut will have full bearing and that metal plies will mate flush between bolts. Install and tighten to a snug condition (ST), such that laminated surfaces bear fully on one another, using an impact wrench or the “full effort” of an installer using a standard spud wrench.
2. Install bolts in matching holes.
    a. Do not distort metal or enlarge holes by drifting during assembly.
    b. Remake mismatched components to achieve tolerances indicated.
    c. Holes mismatched in excess of 1/8-inch will be rejected.
    d. Ream holes mismatched in excess of 3/32-inch to the next larger size bolt.
    e. Do not enlarge holes by flame cutting or air/arc (“plasma“) cutting.
    f. Provide flat washer(s) at over-size holes.
3. Provide ASTM F436/F436M beveled washers when the slope of the surfaces of parts in contact with the bolt head or nut is greater than 1:20.
4. Do not install bolts with damaged threads.

E. High Strength Bolts:

1. Install in accordance with the referenced standard for bearing type high strength bolting unless otherwise indicated on Drawings.

2. Snug tighten in accordance with RCSC Section 8.1.
3. Provide slip critical connections where indicated on Drawings and pretension in accordance with RCSC Section 8.2.

F. Field Welding:

1. General: Weld per AWS procedure; use qualified welders. Preheat in accordance with AWS where required.
   a. Welding shall be under supervision of testing laboratory.
2. Welding:
   a. Weld in a manner to prevent warping or distortion of finished product.
   b. Use jigs which will not restrain piece from moving during welding and cooling after welding.
   c. Sequence weld passes at a joint to prevent excessive heat build-up or cause shrinkage cracks to form.
   d. Adequately peen and brush joint after successive passes to prevent slag inclusions, open pockets, and inadequate fusion.
3. Auxiliary Member Connections and Temporary Welds: Comply with AWS except that preheating may be omitted on ASTM A36/A36M steel for single pass fillets welds with low hydrogen electrodes under following conditions:
   a. Air temperature is 60 degrees F or over.
   b. Steel is dry.
   c. Welds to structure base material are more than 1 inch away from corners or ends of plates.

G. Touch-up: After erection is complete, touch-up all shop priming coats damaged during transportation and erection, and prime all field welds, using the prime paint specified for shop priming.

H. Supports, Shoring and Bracing:

1. General:
   a. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
   b. Conform to requirements of applicable laws and governing safety regulations.
   c. Systems shall resist imposed loads, including those of stored materials and equipment.
2. Provide temporary supports, shoring and bracing necessary to achieve work of tolerances indicated.
3. Provide necessary temporary flooring, planking and scaffolding required for erection of steel, and support of erection machinery.
4. Do not overload the structure or temporary supports with stored materials, equipment or other loads.

5. Maintain temporary bracing and shoring until work is complete or longer when required to ensure stability and safety of structure.

I. Acceptance of Position and Alignment:

1. Prior to placing or applying any other materials, the Contractor is responsible for determining that the location of the structural steel is acceptable for plumbness, level and alignment within tolerances.
2. The erector shall be given timely notice of acceptance by the Contractor or a listing of specific items to be corrected in order to obtain acceptance. Such notice is rendered immediately upon completion of work and prior to start of work by other trades that may be supported, attached to the structural steelwork.
3. Do not make final connections until structure is aligned to meet specified tolerances.

3.3 ERECTION TOLERANCES [AND SURVEY]

A. Erection Tolerances:

1. In accordance with the AISC Code of Standard Practice and the following.
   a. Maximum Variation from Plumb: 1/4-inch per story, non-cumulative,
   b. Maximum Offset from True Alignment: 1/4-inch.

3.4 FIELD QUALITY CONTROL

A. General:

1. The independent Testing Agency will perform field quality control tests as specified in Section 01 4523, Testing and Inspection Services.
2. Field Welding Inspection: Conform to requirements of Article SOURCE QUALITY CONTROL in Part 2.
3. Costs in connection with field welding or tests for structural steel will be paid by the Owner, except that costs of re-inspection of items which did not initially pass and testing of unidentified steel will be backcharged to the Contractor.

B. Test structural steel material in accordance with CBC Section 1705A.2.1.

1. Testing of ASTM A36/A36M steel shall be based on Fy=36 ksi.
2. Testing of ASTM A500/A500M steel shall be based on Fy = 46 ksi for square and rectangular HSS.
3. Testing of ASTM A53/A53M steel shall be based on Fy = 35 ksi.
4. Testing of ASTM A992/A992M steel shall be based on Fy = 50 ksi.
5. Testing of ASTM A500/A500M steel shall be based on Fy = 42 ksi for round (HSS).

C. Testing and inspection of high strength bolt installation shall be in accordance with CBC Section 1704A.2.5 and 2213A.1.

D. Testing of end weld studs shall be in accordance with CBC Section 2213A.2.

E. Inspection of welding shall be in accordance with CBC Section 1705A.2 and 2204A.1.

1. Welding shall be done under supervision of recognized testing laboratory by qualified Inspector approved by DSA, who will furnish Architect, Structural Engineer and DSA with report, duly verified by both Inspector and Laboratory, that the welding is adequate and has been done in conformity with Drawings and Specifications and that Laboratory has used every means necessary to determine quality of weld.
2. Testing Laboratory may use gamma ray, magnaflux, trepanning, or other non-destructive aid to visual inspection which it deems necessary to assure itself of adequacy of welding.
3. Every layer of weld shall be inspected for quality and every welded joint shall be inspected for quality and every welded joint shall be inspected for conformance with the Drawings.

3.5 ADJUSTING

A. After erection, clean field welds, bolted connections, and abraded areas of the shop primer.

1. Touch-up damaged finishes with compatible specified primer to comply with SSPC-PA 1 for touching up shop-painted surfaces.
2. Use cold galvanized paint at galvanized finish.

B. Replace defective or damaged work which cannot be corrected in the field with new conforming work, or return defective items to the shop for repair.

1. Architect will review proposals for the repair or replacement of damaged, defective, or missing work.
2. Defective work shall be repaired or replaced at no additional cost to Owner.

C. Straighten materials by means that will not injure the materials.

D. Contractor to pay expenses incurred by Owner for Architect's costs for re-design and obtaining approvals of Authorities Having Jurisdiction (AHJ) necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work.

E. Contractor to pay expenses due to re-testing and re-inspection necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work.

3.6 CLEANING AND PROTECTION

A. Clean all surfaces upon completion of erection leave free of grime and dirt. Remove unused materials, tools, equipment and debris from the premises and leave surfaces broom clean.

B. Protect work from damage by subsequent operations.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hollow metal doors.
2. Pressed metal frames.

1.2 RELATED REQUIREMENTS

A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

C. Section 07 9200, Joint Sealants.

D. Section 08 7100, Door Hardware.

E. Section 09 9100, Painting.

F. Division 26, Electrical.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. American National Standards Institute (ANSI)/ Door and Hardware Institute (DHI)/Steel Door Institute (SDI):

1. ANSI A250.6: Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
2. ANSI A250.7: Nomenclature for Steel Doors and Steel Door Frames.
3. ANSI A250.8: Recommended Specifications for Standard Steel Doors and Frames.
4. ANSI A250.10: Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11: Recommended Erection Instructions for Steel Frames.
6. ANSI/DHI A115: Hardware Preparation in Hollow Metal Doors and Frames.

D. ASTM International (ASTM):

1. A568/A568M: Specification for General Requirements for Steel, Carbon and High-Strength Low-Alloy Hot-Rolled Sheet and Cold-Rolled Sheet.
2. A653/A653M,: Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. A1008/A1008M: Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
4. A1011/A1011M: Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

E. Hollow Metal Manufacturers Association (HMMA) Division of the National Association of Architectural Metal Manufacturers (NAAMM):

1. Hollow Metal Manual.

F. National Builders Hardware Association (NBHA):

1. Recommended Location of Builder's Hardware.

G. National Fire Protection Association (NFPA):

1. No. 80: Fire Doors and Windows.
2. No. 252: Fire Tests of Door Assemblies.

H. Steel Door Institute (SDI):

1. SDI-107: "Hardware on Steel Doors Reinforcement--Application.
2. SDI-111C: Recommended Louver Details for Standard Steel Doors.

I. Underwriters Laboratories (UL):

1. UL 10B: Fire Tests of Door Assemblies.
2. UL 10C: Positive Pressure Fire Tests of Door Assemblies.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Hardware supplier shall furnish steel door and frame manufacturer with accepted hardware schedule, hardware templates, and samples of physical hardware where necessary to ensure correct fitting and installation.
2. Preparation includes sinkages and cutouts for mortise and concealed hardware.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Show parts, connections and anchorages, adjacent materials, fully dimensioned and noted.
2. Include the following specific information:
   a. Elevation and material of doors and frames.
   b. Jamb and head details.
   c. Hardware preparation locations and reinforcing details of doors and frames.
   d. Door and frame location schedule.
   e. Complete door and frame descriptive nomenclature.
   f. Material description and gages.
   g. Meeting stile details.
   h. Methods of anchorage.
   i. Glass molding details.
3. Use same reference numbers for details and openings as those indicated on Drawings.

B. Product Data: Submit list and complete descriptive data of products proposed for use. Include the following:

1. Manufacturer's specifications.
2. Manufacturer's installation instructions.
3. Manufacturer's maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

A. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

B. Sample of manufacturer’s warranty.

1.7 CLOSEOUT SUBMITTALS

A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. Use materials and products of one manufacturer whenever possible.

C. Materials, components, assemblies, workmanship and installation are to be observed by the Project Inspector. Work not so inspected is subject to uncovering and replacement.

D. Manufacture labeled doors and frames in strict conformance with the specifications and procedures of Underwriters Laboratories Inc. (UL) or Warnock Hersey.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

B. Store materials in an upright position, protected under cover, dry conditions at least 4 inches off the ground and in areas so as to not interfere with the progress of the work. Doors with dents or other defects not repairable will be rejected.

C. Transport, store and handle in strict conformance with the manufacturer's written recommendations.

D. Assembled frames shall be stored in a vertical position, 5 units maximum in a stack.

E. Do not use non-vented plastic or canvas shelters, because these create a humidity chamber and promote rusting. Remove wet wrapping or packing from doors and frames immediately. Provide 1/4 inch space between doors and between frames to promote air circulation.

1.10 FIELD CONDITIONS

A. Verify that conditions are correct and proper for installation of products. Obtain accurate job dimensions of openings including floor elevations. Ascertain correct locations and arrangements of anchorage required to accommodate work.

1.11 WARRANTY

A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranty for doors and frames against defects in materials and workmanship, including twisting, buckling or warping.

1. Warranty shall cover replacement of door plus costs of hanging and finishing.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Steel Doors and Frames: Titan Metal Products, Inc., Merced CA; Door Components, Inc., Fontana, CA; Steelcraft; or equal SDI Certified manufacturer.

2.2 DESIGN AND PERFORMANCE CRITERIA

A. Fire-Rated Assemblies:

1. Fire-Rated Door Assemblies: Complying with NFPA 80 and listed and labeled by approved testing agency as part of a fire door assembly, complete with type of fire door hardware to be used, based on testing at positive pressure according to NFPA 252 or UL 10C.
2. Fire-Rated, Borrowed-Lite Assemblies: Complying with NFPA 80 and listed and labeled by approved testing agency for fire-protection ratings indicated based on testing according to NFPA 257 or UL 9.

B. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by approved testing agency based on testing according to UL 1784 and installed in compliance with NFPA 105.

C. Testing and Labeling Agency for Labeled Assemblies: Underwriters Laboratories, Inc. (UL), Intertek Testing Services-Warnock Hersey (ITS-WH), or other qualified testing agency acceptable to authorities having jurisdiction.

D. Sustainable Design:

1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.3 MATERIALS

A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A568/A568M and ASTM A1011/A1011M.

B. Cold-Rolled Steel Sheets: Commercial-quality carbon steel complying with ASTM A568/A568M and A1008/A1008M, exposed, matte finish, oiled.

C. Galvanized Steel Sheets: Commercial-quality zinc-coated carbon steel complying with ASTM A653/A653M, with A60 or G60 zinc coating.

D. Supports and Anchors: Fabricated of not less than 18-gauge galvanized sheet steel.

E. Inserts, Bolts, and Fasteners: Manufacturer's standard units.

F. Shop-Applied Paint: Rust-inhibitive primer, either air dried or baked on, suitable as a base for specified finish paints.

2.4 FABRICATION - GENERAL

A. Conform to requirements of SDI or NAAMM.

B. Fabricate steel doors and frames to required profiles and sizes by forming with edges straight and sharp.

C. Fit and fabricate accurately with corner hairline joints and all surfaces free from warp, wave, buckle, and other defects.

D. Welding:

1. In accordance with AWS standards for high-grade hollow metal work.
2. Grind exposed beads smooth.

2.5 FINISH HARDWARE PREPARATION

A. Prepare steel doors and frames to receive mortised and concealed hardware, including cutouts, reinforcing, drilling, and tapping, in accordance with final Finish Hardware Schedule and templates provided by hardware suppliers. Preparation shall comply with ANSI A115, where applicable, and SDI-107.

B. Provide minimum gauge hardware reinforcing in accordance with Table 4 of ANSI A250.8 or Table 1 of ANSI A250.6, except as follows:

1. Provide 7 gauge (3/16 inch, 4.76 mm) steel reinforcement for hinges.
2. Provide 12 gauge (0.093 inch, 2.3 mm) for lock strikes and closers.
3. Provide 14 gauge (0.093 inch, 1.7 mm) for surface applied hardware.

C. Provide reinforcement at head of frames for surface mounted closers at doors whether or not closers are indicated.

D. Punch lock jamb of frames; install rubber door silencers, 3 at single doors and 4 at each pair of doors. For pairs of doors, locate door silencers at head, 2 for each door. Omit silencers at tabled doors.

E. Provide steel housing closures for hardware mortise to prevent intrusion of plaster, mortar or concrete.

F. Provide full height, 3/4 inch deep x width of rabbet, polystyrene insulation at back of frames which will be fully grouted in-place using mortar type grout only and where continuous hinges are scheduled to be installed. Insulation is intended to act as a concrete block-out for future field drilling or tapping.

G. Concealed Overhead Closers: Provide spaces, cutouts, reinforcing, and provisions for fastening in top rail of doors or head of frames as applicable.

H. Reinforce steel doors and frames to receive surface-applied hardware.

1. Perform drilling and tapping for mortise hardware at factory to templates furnished by hardware vendor.

2. Drilling and tapping for surface-applied hardware shall be done by hardware installer;

I. Hinge reinforcing shall be full width of frame profile.

J. Provide spaces for all thru-bolted hardware.

K. Locate finish hardware as shown on final shop drawings or, if not shown, in accordance with NBHA publication "Recommended Location for Builder's Hardware."

2.6 HOLLOW METAL DOORS

A. Prior to fabrication, verify every opening condition, including size, and coordinate with door sizes as shown on Drawings and approved submittals.

B. Fabrication:

1. Shop fabricate to required sizes and shapes.
2. Form and weld with straight arrises, edges and corners; surfaces free from warp, wave, buckle, dents or other defects.
3. Use of excessive plastic filler to conceal manufacturing defects is not acceptable. Construct in accordance with HMMA specifications and standards (latest edition) in addition to requirements as indicated in these Specifications.
4. Fabricate exposed faces of doors only from cold-rolled steel.
5. Vertical edges shall be beveled 1/8 inch in 2 inches.
6. Make cutouts for required louvers and glazing.
7. Exterior Doors:
   a. Exterior doors shall be fabricated from specified galvanized-steel sheets.
   b. The top and bottom of out-swinging exterior doors shall be closed with either a flush or inverted channel cap not less than 16 gauge, welded, filled, and finished smooth to provide protection from entry of water inside door.
   c. Openings to be provided in the bottom closure to permit the escape of entrapped moisture.

C. ANSI/SDI Classification:

1. Exterior: Level 4, Model 2, seamless composite construction.
   a. Face sheets shall be 16-gauge.
   b. Insulated for a minimum “U” value of 0.24 except where opening into unconditioned spaces.
2. Interior Non-Fire-Rated: Level 2, Model 2, seamless composite construction.
   a. Face sheets shall be 18-gauge.
   b. Core: Honeycomb laminated to the inside of both face sheets.
3. Interior Fire-Rated: Level 2, Model 2, seamless composite construction.
   a. Face sheets shall be 18-gauge unless otherwise required for required rating.
   b. Core: Mineral fiber or as standard with manufacturer to meet scheduled fire rating.

c. Rating: As scheduled.

2.7 DOOR ACCESSORIES

A. Vision Frames: 20 gauge (0.042 inch, 1.0 mm) cold rolled steel, low profile, two-piece with mitered and welded corners with counter-sunk mounting holes for flush assembly; “LoPro” by Anemostat, or equal.

1. Finish: Manufacturer’s standard primer and field painted to match door color.
2. Size: As indicated on the Drawings and to receive scheduled glass thickness.
3. Frame shall be fire tested with UL and WHI mark at fire-rated doors where noted in door schedule.

B. Glazing Stops: rolled steel channel shape, mitered corners, prepared for countersink style tamperproof screws at door installations, square at light frames.

2.8 PRESSED METAL FRAMES

A. Provide steel frames of the types and styles indicated on the Drawings.

B. Gauges: In accordance with SDI recommendations for the door Grade specified.

1. At Doors: Not less than 16 gauge.
2. Label Frames: 14 or as included in UL test procedure.

C. Prior to fabrication, verify every substrate opening condition, including size and wall thickness, and coordinate with door sizes as shown on Drawings and approved submittals.

D. Fabrication: Manufacturer's standard, modified where shown and specified.

1. Fabricate frames from cold-rolled steel.
2. Exterior frames shall be fabricated from specified galvanized-steel.
3. Factory-assembled and welded into a single unit by frame manufacturer. Saw-miter or cope and tab frame miters, and continuously weld at return, face, rabbet, and stop.
4. Shop fabricate with straight arises, edges and corners; surface free from warp, wave, buckle, dents or other defects. Use of excessive metallic filler to conceal manufacturing defects is not acceptable.
5. Cross section profile as shown, depth to suit wall thickness.
6. Header and jambs secured at corners by internal welding of faces or by welded splice plates, and further secured at webs by welding or mechanical interlock; exposed joints neat and tight.
7. Provide continuous steel nailing flange at exterior side (no corner cutout at head/jamb intersection - flange to run continuous around corner).
8. See Article “Finishing” for required moisture proofing/sound deadening coating.
9. At joints of intersecting mullions, seal with 3M “Lightweight Body Filler” followed by 3M “Ultrapro MSP Sprayable Seam Sealer,” or equal.

E. Anchors:

1. General:
   a. Provide at 2'-0" maximum spacing.
   b. Provide minimum 2 anchors at head of frames over 2'-6" wide, and minimum 4 anchors per door jamb. Bottom anchor shall be within 2 inches floor.
   c. Anchors shall provide stiffness and rigidity to keep frames square, in accurate position without twisting, buckling or warping.
   d. Position one jamb anchor above top butt reinforcement and one jamb anchor below bottom butt reinforcement.
   e. At rated openings, anchors shall be UL approved for use on labeled frames.
2. Anchor Types:
   a. Existing Wall, Wood Framing: Fixed 16-gauge (0.053 inch, 1.3 mm) x 2-inch, u-shaped strap spacers welded to frame interior.
      1) Pipe spacers may be used in addition to fixed strap spacer but may not be used as a substitution for the fixed strap spacer.
      2) Use FHMS with minimum 2 inches penetration into solid framing. Seal exterior, exposed fastener heads to make waterproof.
   b. Existing Wall, Masonry and Concrete: Fixed 16-gauge (0.053 inch, 1.3mm) x 2 inches, U-shaped strap spacers welded to frame interior.
      1) Pipe spacers may be used in addition to fixed strap spacer but may not be used as a substitution for the fixed strap spacer.
      2) Fasten frame to door or window opening using expansion anchors.
      3) Seal exterior, exposed fastener heads to make waterproof.
   c. Other areas: As required for secure, installation as recommended by the HMMA.

F. Moisture Proofing/Sound Deadening Coating:

1. Exterior Frames and Frames Anchored to Masonry Walls: Coat inside (concealed) faces of pressed metal frames with fibered water based, asphalt emulsion similar to autobody undercoating.
2. Apply over shop primer 1/8 inch thick and thoroughly dry before handling.

G. Special Frames: 16 gauge (0.053 inch, 1.3 mm) with integral stop formed to cross section profile indicated.

1. Provide muntins, mullions, and impose sections required, removable glazing stops or molding secured with tamper-proof oval head self-tapping screws set in countersunk holes at 12 inches on center.
2. Weld corners of frame, grind smooth on exposed frames.
3. Structure shall be adequate to withstand 25 lbs/sf wind load normal to glass surface.

2.9 FINISHING

A. General:

1. Prior to and after primer is applied, store and protect doors properly to prevent the possibility of rusting or moisture damage.
2. Verify and coordinate primer compatibility with finish painting.

B. Shop Painting:

1. After fabrication, thoroughly clean surfaces of mill scale, rust, oil, grease, dirt, and other foreign matter, and chemically treat with phosphate compound so as to assure maximum paint adhesion.
2. After pre-treatment of galvanized metal, apply shop coat of rust-inhibitive primer of even consistency in order to provide a uniformly finished surface, ready to receive finish painting.
3. Finish shall comply with ANSI A250.10.
4. Provide different colored shop primer to differentiate galvanized from non-galvanized products when delivered to Project site.
5. Back coat frames with asphaltic emulsion wherever frames will be in contact with masonry.

C. Doors and frames shall be re-primed on-site prior to finish painting specified in Section 09 9100, Painting.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation of the work of this Section, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.

B. Do not install doors in frame openings that are not plumb, are out of tolerance for size or alignment, or would hinder door operation.

C. Verify that specified items may be installed in accordance with the approved design.

D. Confirm that opening sizes and tolerances are acceptable and ready to receive this work.

E. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION - GENERAL

A. Install metal doors and frames and accessories in conformance with reviewed Shop Drawings and manufacturer's data, and as specified herein.

3.3 INSTALLATION OF FRAMES

A. Install frames in accordance with ANSI/SDI A250.11.

B. Securely fasten frames to wall construction involved (wire anchors not acceptable).

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
   a. In masonry construction, locate 4-wall anchors per jamb minimum or at 2'-0" on center maximum and aligned with hinge and strike locations. Coordinate installation of anchors and grouting of frames with other trades.
2. At exterior wall locations where frame is installed in a wall with a concrete curb base, fill the bottom void of the frame with non-shrink grout to match the height of the concrete curb. Repair frame modifications to a blemish free new condition. Do not cut or modify the frame if it conflicts with the concrete curb. If concrete curb conflicts with frame, adjust or modify curb as required.
3. Attach bottom anchors to concrete curb, where occurs, with drilled-in concrete anchors
4. Attach continuous nailing flange securely to wood studs with 4 No. 12 inches x 2 inches flat head wood screws per anchor. Attach anchor straps at interior side and interior straps with 4 10d ring shank nails per anchor.
5. Seal perimeter of frames to fill space between frame and adjoining material. Seal exterior, exposed fastener heads to make waterproof. Sealant materials and application shall conform to applicable requirements of Section 07 9200, Joint Sealant.
6. When installing new frames in existing openings, remove existing finishes sufficiently to properly install and adequately fasten new frame. Prepare openings as required to receive new frame. Provide misc. shimming, blocking, backing, straps, etc. to fully prepare opening for new frame. Patch and repair surfaces when completed to match adjacent finishes.

C. Grouting:

1. Except for frames installed in metal and wood stud walls and existing walls, grout frames solid using mortar type grout only.
2. Verify moisture proofing/sound deadening coating has been applied before proceeding.

D. Install door flashing system components as described in this specification, indicated in Drawings and as recommended by the flashing manufacturer.

E. Install fire-rated frames in accordance with NFPA Standard No. 80.

3.4 INSTALLATION OF DOORS

A. Hang with clearances noted in Section 08 7100, Door Hardware, unless otherwise indicated or required for rated assemblies. Apply hardware in conformance with ANSI 250.08 and the manufacturer's written instructions.

B. Place fire-rated doors with clearances as specified in NFPA Standard No. 80.

C. Do not erect members that are observed to be warped, bowed, deformed, or otherwise damaged or defaced to such extent as to impair strength or appearance. Remove and replace members that have been damaged in process of erection.

D. Removable Glazing Stops: Install with tamperproof screws, with sealant at penetrations to pressed metal frame.

E. Coordinate installation of hardware including installation of intrusion detection system components and wiring.

F. Intrusion Coordination: Relocate wiring and provide new, compatible sensors in new doors as required for a fully operational system.

G. Intrusion alarm: Coordinate wiring and sensor installation with electrical.

3.5 INSTALLATION TOLERANCES

A. Edge clearance for swinging doors shall not exceed the following:

1. Between door and frame at head and jamb: 1/8 inch.
2. Between edge of pair of doors: 1/8 inch.
3. At door sill with threshold. (From bottom of door to top of threshold): 3/8 inch.
4. At door sill with no threshold: 1/2 inch.
5. At door bottom and rigid floor covering per NFPA 80: 1/2 inch.
6. At door bottom and nominal floor covering per NFPA 80: 5/8 inch.

B. Frame installation tolerance shall not exceed the following:

1. Squareness+-1/16 inch.
2. Alignment+-1/16 inch.
3. Plumbness+-1/16 inch.
4. Diagonal Distortion+-1/32 inch.

3.6 PROTECTION

A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.

B. In the event of damage, immediately make repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.7 ADJUSTING

A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Immediately prior to punch list walk-through, check and re-adjust operating finish hardware items, leaving metal doors and frames undamaged and in complete operating condition.

END OF SECTION

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Last Updated: January 7, 2022

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Finish hardware for doors.

1.2 RELATED REQUIREMENTS:

A. Section 08 1113, Hollow Metal Doors and Frames.

B. Divisions 23 and 26, Mechanical or Electrical Work, for panel cabinets and pull cans.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. American National Standards Institute (ANSI)/Builders Hardware Manufacturers Association (BHMA):

1. ANSI/BHMA A156 Series Standards, as listed:

D. ASTM International (ASTM):

1. E 90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
2. E 283: Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

E. Americans with Disabilities Act (ADA) Standards for Accessible Design.

F. National Fire Protection Association (NFPA):

1. NFPA 80: Standard for Fire Doors and Other Opening Protectives.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Pre-Installation Meeting. Conduct a coordination meeting prior to purchasing doors and door frames. Require attendance of the following: Contractor, Architect, hardware supplier, door supplier and frame supplier.

C. Coordination:

1. Examine the Contract Documents and furnish proper hardware for door openings. Examination includes, but is not limited to, the following:
   a. If hardware Groups are missing fire or smoke rated required devices, provide all devices to meet codes.
   b. Where hardware Groups have different information than the Specifications, refer to the Specifications and Drawings for clarification and provide hardware represented by combining hardware information represented by Drawings and Specifications.
2. Coordinate work of this Section with other directly affected Sections involving manufacturer of any internal reinforcement for door hardware.
   a. In particular, coordinate door preparation in accordance with applicable regulatory and trade standards specified.
   b. Review details and conditions prior to ordering material. If door hand is changed during construction, coordinate and change hardware as necessary at no cost to the Owner.
   c. Coordinate Keying requirements as specified in this Section.
3. Submit templates and Architect-reviewed hardware schedule to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.
4. Send Installation Instructions to site with hardware.
5. To assure specified single source responsibility, coordinate with other Section that have BHMA items to have the same models and devices throughout project.

1.5 ACTION SUBMITTALS

A. Hardware Schedule: Submit completely detailed finish hardware schedule, in vertical format.

1. Reference hardware headings to groups specified and clearly indicate door type or mark location, hand, size, material and fire rating if applicable.
2. List Manufacturer's names and numbers for items used in schedule to facilitate checking for compliance.
3. Provide listing of manufacturer's template numbers for each item of hardware in hardware schedule.
4. Schedule shall be prepared under direct supervision of a member of the Door and Hardware Institute (DHI). Include verification of supervision on submittal.
5. Submit in sufficient time for Architect's review and for supplier to place order with manufacturers in order to meet Project Schedule.

B. Wiring Diagrams: Provide complete and detailed system operation and elevation diagrams specially developed for each opening requiring electrified hardware, except openings where only magnetic hold-opens or door position switches are specified.

1. Provide these diagrams with hardware schedule submittal for approval.
2. Provide detailed wiring diagrams with hardware delivery to jobsite.

C. Product Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

D. Samples: Submit physical sample of each item of hardware substituted for specified item or its listed acceptable alternate.

1. Clearly mark each sample to indicate name of item, brand name, manufacturer's catalog number and item for which it is substituted.
2. Submit with finish hardware schedule.
3. Approved samples may be used in work. Rejected samples will be returned and specified item or its acceptable alternate shall be provided.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For supplier and installer.

B. Sample of manufacturer’s warranty.

C. Record of pre-installation meeting.

1.7 CLOSEOUT SUBMITTALS

A. Warranty/Guarantee: Submit executed warranties and Subcontractor’s guarantee.

1.8 QUALITY ASSURANCE

A. Qualifications:

1. Supplier: Firm specializing in the supply and servicing of institutional and commercial door hardware; accredited by manufacturers; and having a minimum of 3 years documented experience.
2. Installer: The installer of assembly shall be trained in the trade of hanging commercial doors on commercial frames with commercial hardware.

B. The finish hardware supplier shall provide the services of an Architectural Hardware Consultant (AHC), a member of the Door & Hardware Institute for consultation at no additional cost to the Owner during course of construction.

C. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

D. Use materials and products of one manufacturer whenever possible.

E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

F. Catalog Standards: Manufacturer's catalog numbers in the Specifications are for convenience in identifying items. Catalog descriptions of these items constitutes minimum requirements.

1. The use of catalog numbers and specific requirements set forth in Drawings and Specifications does not preclude the use of any other acceptable manufacturer's products or procedures which may be equivalent, but establish a standard of design and quality for materials, construction and workmanship.
2. Refer to Article “Substitutions, Pre-Approved Equal” for information regarding substitutions.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact, marked to correspond with Finish Hardware Schedule.

B. Package and mark hardware for door number, hardware type and location.

C. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the work.

D. Transport, store and handle in strict accord with the manufacturer's written recommendations.

E. Any items of hardware requiring fabricator installation: Deliver as directed by General Contractor. Storage and protection of Finish Hardware, once delivered as directed, is responsibility of General Contractor.

1.10 TEMPLATES

A. Hardware applied to aluminum or metal door and frames and factory prepared wood doors and frames shall be made to template. Furnish two copies of each template to those Manufacturers who are not listed as current registered template book holders. Furnish 2 copies of each template for items whose Manufacturers do not provide registered template book. Furnish 2 copies of approved finish hardware schedule for use by these door and frame suppliers.

1.11 WARRANTY

A. Manufacturer: In addition to the Contractor’s and Subcontractor’s Guarantee, furnish Owner with manufacturer’s fully executed written warranty for each type of hardware against defects in materials and workmanship for the following:

1. Hinges: Lifetime Warranty (Life of Building).
2. Locksets: “L” Series three (3) years, “ND” ten (10) years.
3. Closers: Twenty (20) years.

4. All other hardware: Two years.
5. Exit devices: Three (3) years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Finish hardware shall comply with applicable fire and building codes, including provisions for accessibility required by the CBC and ADA Standards for Accessible Design. Comply with the most stringent.

B. Hardware for fire-rated openings shall comply with CBC, Underwriter's Laboratories (UL) Standard 10C, "Positive Pressure Fire Tests Of Door Assemblies," National Fire Protection Association (NFPA) Standard 80, "Fire Doors and Windows," and Standard 101, "Life Safety Code."

C. Door Clearances: Unless detailed otherwise on Drawings, provide following door clearances:

1. Floor Clearance:
   a. Labeled doors 3/8 inch max. over floor or threshold
   b. No threshold 3/4 inch max. for metal doors; 5/8 inch max. for wood doors
   c. Threshold 1/8 inch typical
   d. Carpet 1/8 inch over top of nap
2. Head and Jamb Clearance 1/8 inch max.

D. Furnish hardware in proper "hand" for doors.

E. Exit door latching devices shall be self-releasing type operable from inside at all times by simply turning lever or by pressure on panic device.

2.2 MATERIALS - GENERAL

A. The Specifications are intended to cover all doors in the Project and establish a type and standard of quality, but it is the responsibility of the Contractor to furnish proper hardware for all openings and for a complete installation, whether specified or not specified.

B. If there are omissions in Specifications and hardware groups required for a complete installation, it shall be called to the attention of the Architect when the Hardware Schedule is submitted.

C. No extra cost will be allowed because of changes or corrections necessary to facilitate the proper installation of any hardware.

D. Templates: Hardware applied to metal doors or jambs shall be made to template and secured by machine screws.

2.3 MANUFACTURERS

A. Catalog numbers specified and in the Hardware Groups are those of following manufacturers:

1.	Hinges	Ives
2.	Locks, Latches and Cylinders	Schlage
3.	Exit Devices (panic hardware)	Von Duprin
4.	Closers	LCN
5.	Push, Pulls and Protection Plates	Ives
6.	Flush Bolts	Ives
7.	Dust Proof Strikes	Ives
8.	Coordinators	Ives
9.	Seals and Bottoms	Zero
10.	Floor/Wall Stops	Ives
11.	Overhead Stops	Glynn Johnson
12.	Thresholds	Zero

B. Acceptable Alternate Manufacturers: Items produced by following manufacturers, equal to those specified in material, weight, size, function, design and finish will be considered pre-approved equals to those items specified and will not require submittal of physical sample or request for substitution.

1.	Hinges	Stanley, Hager, McKinney
2.	Locks and Cylinders	approved equal
3.	Exit Devices (panic hardware)	approved equal
4.	Closers	approved equal
5.	Push, Pulls and Protective Plates	Trimco, BBW, DCI
6.	Flush Bolts	Trimco, BBW, DCI
7.	Dust Proof Strikes	Trimco, BBW, DCI
8.	Coordinators	Trimco, BBW, DCI
9.	Seals and Bottoms	Pemko, National Guard
10.	Floor/Wall Stops	Trimco, BBW, DCI
11.	Overhead Stops	approved equal
12.	Thresholds/Weatherstripping	Pemko, National Guard

C. Architect's decision regarding any item submitted for approval as equal to that specified shall be final.

2.4 SUBSTITUTIONS, PRE-APPROVED EQUAL

A. Architectural hardware of equivalent size, type, finish, and function to that specified and listed will be accepted by the Architect as equivalent to the respective items specified, provided such hardware is approved by the Architect, whose decision will be final. Architectural hardware that is not specified or listed as an approved equal will be

considered as a substitution and shall be subject to the approval of the Architect, whose decision will be final.

B. Refer to Section 01 3300, Submittal Procedures, for additional requirements.

2.5 HINGES

A. Furnish all hinges with non-rising pins.

1. Hinges specified to have non-removable pins (NRP) shall have pins prepared, and be furnished with hinges tapped and set screws installed.

B. Size: Unless otherwise specified, conform to following:

1. Length:
   a. For doors to 3'-0" wide: 4-1/2 inches.
   b. For doors over 3'-0" to 4'-0" wide: 5 inches
2. Width: 2 times door thickness plus trim protection, but not less than 4-1/2 inches unless otherwise specified.

C. Hinges shall be five (5) knuckle, two (2) ball bearing heavy duty hinges, unless otherwise indicated.

D. Ball bearings shall be concealed.

E. Pins shall be stainless steel, shall have continuous groove for seating of NRP Screws and shall have springloaded ball to prevent rising.

F. Hinge (butt) type shall be as scheduled.

G. Exterior hinges shall be nonferrous.

H. Interior rated hinges shall be steel.

2.6 CLOSERS

A. Key valve type. Furnish one key for each 5 closers.

B. Fasten with 4-sex bolts per closer.

C. Provide 180 degree opening unless indicated otherwise. Provide parallel arms with jamb attachment for all out-swinging doors

D. Provide correct brackets at flush transom panel doors.

2.7 DOOR STOPS

A. Base material shall be solid brass or bronze with finish as hereinbefore indicated. Floor types shall have strikes of suitable height to compensate for clearance between door and floor, verify height.

B. Attachment conditions vary; provide appropriate fastener for each location as needed. Conditions to be field verified prior to ordering.

C. Install door stops a maximum of 4 inches from face of wall.

2.8 WEATHERSTRIPPING AND SEALS

A. Smoke Seals: UL listed door gaskets shall be installed to provide a seal where door meets the stop on both sides and across the top. Locations of doors to receive door gaskets shall be as indicated on the Drawings or as specified herein.

B. Weatherstripping shall be tested in accordance with ASTM E 283 and shall meet or exceed the requirements thereof. Locations as indicated on the Drawings and scheduled herein.

C. Sound Seals: Tested in accordance with ASTM E 90 with a minimum STC Rating of 31 at wood doors and 41 at hollow metal doors. Locations as indicated on the Drawings and scheduled herein.

2.9 THRESHOLDS

A. Thresholds shall be sized as required for door opening. Use a single threshold whenever possible at double door installation. Thresholds to comply with 11B-404.2.5.

2.10 EXIT DEVICES

A. Provide ANSI A156.3, Grade 1; UL Listed devices.

B. All exit devices shall be UL listed for panic. Exit devices for labeled doors shall be UL listed as "Fire Exit Hardware".

C. Provide cylinders for exit devices with locking trim and cylinder dogging. Provide cylinder dogging feature for non-rated exit devices.

D. Provide shims as required for proper clearance at doors with glass panels.

E. Devices shall meet the 5 lb. maximum operable force per CBC Chapter 11B-309.4 for doors and gates.

2.11 SCREWS, BOLTS, AND FASTENING DEVICES

A. Exposed heads oval Phillips type in countersunk holes, unless otherwise specified or required. Use screws, bolts, washers, grommets, nuts, and other fastening devices of appropriate length, type, head, metal and finish, as necessary for proper match and application of hardware.

B. Threshold anchors shall be Flat Sleeve Anchors, FHSL 25 1/4 - 20 2 inch cadmium plated expansion anchor screw in one unit. Fasten in countersunk holes 2-1/2 inches at pre-drilled holes or 9 inches on center maximum spacing and within 3 inches of each end. Minimum 3 anchors per threshold.

2.12 KEYING

A. Key as shown on Schedule approved by Owner. Supplier shall be prepared to meet with Architect and Owner, if required, to assist in creating detailed keying schedule. Provide following:

1. Grand Master Key System with six cut GMK and six master keys per set.
2. Visual key control system.
3. Construction master key system with 20 construction master keys.
4. Three standard bow change keys per lockset.
5. This project shall use Primus cylinder in level two.

B. Key Locks to existing master key system at each school site.

C. Label and deliver all keys by registered mail or personal messenger direct to Owner. Submit bitting list with shipment of permanent keys.

D. If project is an addition or modernization to an existing building or campus, see Owner to determine manufacturer of existing locksets and Grand Master Key systems to match new products. Verify with Owner that locks are to be C-Key way.

2.13 KEY CABINET

A. Type 1: Telkee Aristocrat recessed wall key cabinet Model FMAWC 450-S, or equal.

B. Type 2: Telkee Regent recessed wall key cabinet Model FMRWC 125-S, or equal.

2.14 FINISHES

A. In general, provide finishes as follows, unless otherwise indicated:

1.	Hinges/exterior doors	630	Satin Stainless Steel
2.	Hinges/interior doors	652	Satin Chrome plated
3.	Locks	626	Satin Chrome
4.	Exit Devices (panic hardware)	626	Satin Chrome
5.	Closers	689	
6.	Trim	630	Satin Chrome
7.	Stops	626	Satin Chrome
8.	Floor Closers	626	Satin Chrome
9.	Thresholds/Weatherstripping	Aluminum	
10.	Special Items	As Noted	
11.	Key Cabinet	Factory primed, field painted	
12.	Removable Mullion	Factory primed, field painted	

2.15 FIRE RATED DOORS

A. Equip fire rated doors with UL listed hardware meeting requirements of NFP 80. Treat and equip twenty minute rated openings same as 45 minute rated doors.

B. Exit Door Hardware:

1. Where emergency exit devices are required on fire-rated doors, provide UL or WHI label on exit devices indicating "Fire Exit Hardware."
2. Exit doors in buildings including, but not limited to, door of toilet and storage rooms shall conform with the requirements of CBC Section 716.
3. Exit doors shall be openable from the inside with "non-grasping" operable trim that does not require the use of a key or any special knowledge.

C. Install closing (self-closing) device on every fire door bearing Underwriters' Laboratories, Inc. label.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install hardware in precise manner, in accord with manufacturer's printed instructions; door clearance and hardware placement as specified. Pre-drill pilot holes in wood for screws. Drill and tap for surface mounted hardware on metal. Set hinge leaves snug and flat in mortises; turn screws to flat seat (do not drive).

B. Mount door closers for maximum swing of door before setting stops. Place silencers before adjusting strikes. Drive hinge pins down and tighten set screws.

C. Install locks with keyways in proper position, and knobs, roses and escutcheons firmly affixed.

D. Set thresholds in full bed of waterproof sealant and secure with anchors specified above.

E. Except for hinges, do not install hardware until completion of painting and finishing work.

F. Adjust hardware so that moving parts operate freely without bind or excessive play. Installed hardware shall be free from paint, corrosion or damage.

G. Closer Adjustments: Adjust closers for closing speed, latching speed, back checking, and adjust hold-open devices for full control of door.

1. Closer Operation.
   a. Interior and Exterior Doors: Not to exceed 5.0 pounds force.
   b. When fire doors are required, the maximum effort to operate the door may be increased to the minimum allowed in accordance with applicable Code requirements, not to exceed 15 pounds opening force.
2. Closer delay and operating speeds shall comply with requirements of CBC Section 11B-404.2.8.1 and ADA Standards for Accessible Design.
   a. Doors/gates closers, when provided, shall have sweep period adjusted: minimum of 5 seconds for a door/gate to close from the 90 degree position to the 12 degree position.
   b. Doors/gates with spring hinges require a minimum of 1.5 seconds to close from the 70 degree to the closed position.

3.2 HARDWARE PLACEMENT

A. Unless detailed otherwise, place hardware at following height above finish floor:

1.	Strike (centerline for locks and latches)	40-5/16 inches
2.	Hinges	Manufacturer's Standards
3.	Door Pull (centerline)	42 inches
4.	Pushplate (centerline)	44 inches
5.	Deadlocks	Centerline of strike at 44 inches

B. Exit Devices: Other than doors with full height glazing, the top of Exit Devices are not to be mounted above the bottom of door vision frames.

3.3 CLEANING

A. Clean as recommended by manufacturer. Do not use materials or methods which may damage finish or surrounding construction.

3.4 FINAL INSPECTION

A. Hardware furnished under this Section will be subject to final inspection after installation. Item(s) disclosed by this inspection to have been substituted, or not in compliance with final approved Hardware Schedule, shall be removed and replaced with proper materials and equipment, at the expense of the Hardware Supplier. This expense shall also include cost of proper repair or replacement, as determined by Architect, of doors, frames and other construction to which hardware is attached. Refer to Section 01 7700.

3.5 INSTALLATION AIDS, INSTRUCTIONS AND MAINTENANCE GUIDES

A. Upon completion of installation and adjustment, turn over to Owner dogging keys, closer valve keys, lock spanner wrenches, and other factory furnished installation aids, instructions and maintenance guides.

B. Finish Hardware Schedule should be used as a guide only. In case of omissions, furnish hardware in accordance with that scheduled for a like opening.

3.6 HARDWARE GROUPS

Hardware Group No. 1 - Exterior Doors with Lock (pair)

2	Pr.	Hinges	SL-224HD
		Exit Device	CD98NL-AX x CD98DT x KR4954 Mullion x 154
2	Ea.	Lockset	
2	Ea.	Closer	P4041XP 689
2	Ea.	Kickplate	37-10" x 2" LDW x 630 X .050
2	Ea.	Threshold	Zero 65A
2	Set	Weatherstripping	315 A

Hardware Group No. 2 - Exterior Doors (classroom)

1	Ea.	Threshold	Zero 65A

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient tile flooring.
2. Metal edge protection.

1.2 RELATED REQUIREMENTS

A. Section 01 4520, Concrete Floor Moisture Content and PH Testing.

B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

C. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

D. Section 09 6513, Resilient Base and Accessories, for rubber wall base.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CALGreen), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).

C. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; Federal Register, July 26, 1991; updated 2010.

D. ASTM International:

1. D2240, Standard Test Method for Rubber Property—Durometer Hardness.
2. D4258, Standard Practice for Surface Cleaning Concrete for Coating.
3. D4259, Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application.
4. E303: Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
5. E648, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
6. E662, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
7. E2180, Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) In Polymeric or Hydrophobic Materials.
8. F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

9. G21, Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

E. National Fire Protection Association (NFPA):

1. NFPA 253, Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
2. NFPA 258, Recommended Practice for Determining Smoke Generation of Solid Materials.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Pre-Installation Meeting: Conduct at Project site between applicator, Contractor, and the Architect to review surface preparation, application procedures and layout, protection, coordination with other work, and manufacturer's warranty requirements.

1.5 ACTION SUBMITTALS

A. Shop Drawings: For each type of resilient flooring.

1. Include fully dimensioned flooring layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
2. Show locations of seams.
3. Show details of special patterns.
4. Indicate adjacent materials where applicable.

B. Product Data: Manufacturer's descriptive literature for resilient flooring products and installation accessories verifying compliance with specified attributes, including slip resistance.

C. Samples: The following samples are required.

1. Submit sample for each type of resilient flooring for Architect's review.
   a. Resilient Tile: Minimum 2 inches x 2 inches.
2. Submit manufacturer's full range of colors for Architect's selection. Architect may select more than one color.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample of manufacturer's warranty.

C. Record of Pre-Installation Meeting.

D. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
   b. Resilient Flooring: Documentation or Certification that products meet the pollutant emission limits from one of the sources specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

B. Maintenance Data: For resilient flooring, to include in maintenance manuals for each type of material installed.

C. Specified maintenance materials.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. General:

1. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
2. Tag with manufacturer's label describing product by name, color, and pattern.

B. Resilient Tile: Furnish three unopened boxes of each resilient tile type that match products installed.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for resilient flooring installation and seaming method indicated.

B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

C. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.

D. Materials, components, assemblies, workmanship and installation are to be observed by the Project Inspector. Work not so inspected is subject to uncovering and replacement.

E. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Size: Minimum 8 square feet for each type, color, and pattern in locations directed by Architect.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to Project site in original factory wrappings and containers, labeled with identification of manufacturer, brand name, and lot number.

B. Transport and handle in strict accordance with the manufacturer's written recommendations.

C. Store resilient products and installation materials off of ground in clean, dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer.

1.11 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 degrees F or more than 95 degrees F in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 degrees F or more than 95 degrees F.

C. Do not apply materials on wet or damp surfaces.

D. Install resilient products after other finishing operations, including painting, have been completed.

E. Close spaces to traffic during resilient flooring installation and for 48 hours afterwards.

1.12 WARRANTY

A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with the following manufacturer's fully executed written warranties against defects in materials and workmanship:

1. Luxury Vinyl Tile: 20 years.
2. Adhesive: Covering replacement of finished flooring materials, primers and adhesives for installations over concrete slab-on-grade subfloors for a period of 5 years, unless otherwise noted.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Dry or Wet Slip Resistance:

1. Flooring shall have a Pendulum Test Value (PTV) of 35 or greater under dry and wet conditions using ASTM E303. Alternative test methods, such as use of a BOT-3000E digital tribometer, shall provide equivalent results for both wet and dry conditions.
2. Flooring, after application of a site-applied finish, shall be tested to verify compliance with slip resistance requirements as specified in Article FIELD QUALITY CONTROL.

B. Fire Resistance:

1. Critical Radiant Flux: Class 1 (minimum 0.45 watt per square centimeter) in accordance with ASTM E648 and NFPA 253.
2. Smoke Density: 450 or less in accordance with ASTM E662 and NFPA 258.

C. Sustainable Design:

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
2. Resilient flooring material must comply with one of the certification and compliance programs specified in Section 01 6116.

2.2 PRODUCT DESCRIPTIONS

A. Luxury Vinyl Tile: ASTM F1700, Class III, Type B – printed film vinyl tile, embossed surface.

1. Manufacturer and Product: iD Latitude Series by Tarkett, as specified and the basis of design, or equal.
    a. Dimensions: 6 inches x 48 inches x 0.120 inch in total thickness. 18 inches x 18 inches x 0.120 inch in total thickness.
    b. Wear Layer Thickness: 20 mil.
    c. Style: As selected by Architect.

d. Color: As selected by Architect.
e. Finish: Techtoric.
f. Edge Treatment: Square edge.
g. Static Coefficient of Friction: Minimum 0.8 per ASTM D 2047.
h. Installation Method: Full spread adhesive.
i. Adhesive: As specified by manufacturer.

2. Any proposed substitute must have similar texture/pattern selection as well as physical properties.
3. Architect may choose two different colors (or more if so indicated) from same manufacturer to be installed in pattern as indicated on plans. If pattern is not indicated on plans, Architect will provide at time of submittal.

2.3 WALL BASE MATERIALS

A. Rubber Wall Base: As specified in Section 09 6513, Resilient Base and Accessories.

2.4 ADDITIONAL MATERIALS AND ACCESSORIES

A. Adhesives:

1. Provide adhesive system as recommended by product manufacturer for substrate condition, to effect its product warranty, and complying with Section 01 6116.
2. Adhesives shall be high moisture type tolerant up to 99 percent relative humidity of substrate.

B. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by flooring and adhesive manufacturer for applications indicated.

C. Resilient Molding Accessories: In accordance with Section 09 6513, Resilient Base and Accessories, unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor coverings.

1. Verify that surfaces are smooth and level with no more than 1/8 inch in 10 feet variation from level.

C. Concrete Slab-On-Grade and Above-Grade Concrete Subfloor Testing:

1. Refer to Section 01 4520, Concrete Floor Moisture Content and PH Testing.

a. Perform alkalinity testing.

b. Perform moisture vapor emission rate (MVER) and relative humidity (RH) testing when required by manufacturer to effect its installation warranty and where free liquids and/or moisture stained concrete are observed.

2. Where tests are not satisfactory and substrates exceed the limits required by the floor material manufacturer, do not proceed with installation. Notify Architect for review of conditions and to determine a resolution acceptable to the Architect and Owner including whether application of a topical barrier coat as specified in Section 09 0561, Moisture Vapor Control System, would be required.

D. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation of flooring in areas of discrepancy until all such discrepancies have been resolved and all unsatisfactory conditions have been corrected.

E. Start of installation indicates Installer's acceptance of substrate surfaces and conditions.

3.2 PREPARATION

A. Condition of Existing Surfaces: Prepare existing concrete subfloors to receive new resilient flooring.

1. Using only mechanical or physical means, remove existing flooring, dirt, paint, old adhesive, curing agents or any other material that would inhibit the penetration of the primer into the concrete. Do not acid etch or use chemicals of any kind to clean concrete.
2. Complete preparation with cleaning of subfloors, patching of cracks and other imperfections, and leveling of depressions or holes.
3. Patch and level cracks, holes and depressions with proper patching and leveling compounds compatible with flooring adhesive system.

B. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

1. Concrete floors with curing, hardening and breaking compounds shall be abraded with mechanical methods to remove compounds.

C. Prepare floor substrates in accordance with ASTM D4259 where asbestos abatement has occurred to ensure there is no chemical residue remaining on floor surface that might interfere with adhesion of floor coverings.

D. Sweep and vacuum clean substrates to be covered by floor coverings immediately before installation.

3.3 INSTALLATION

A. General:

1. Do not install resilient products until they are the same temperature as the space where they are to be installed.
   a. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

2. Extend flooring installation under open-bottomed obstructions, and under removable flanges, or obstructions.
3. Extend flooring into closets and alcoves of rooms, unless another floor finish is indicated for such spaces.
4. Extend floor products under all moveable furniture, disabled accessible cabinets and equipment unless otherwise indicated.
5. Scribe, cut, fit and cove to permanent fixtures, built-in furniture and cabinets, pipes and outlets, and permanent columns, walls and partitions as shown on the Drawings.

B. Adhesive Application:

1. Install flooring adhesive using manufacturer's approved materials and installation methods.
2. Follow adhesive manufacturer's directions for mixing and applying. Cover surface evenly. Do not exceed working area or time limits recommended by manufacturer.

C. Resilient Tile Installation:

1. Lay from centerline mark so that cut tiles at opposite sides of room are of equal width and cuts are as wide as possible. Layout shall be square and parallel with straight unbroken joint lines.
2. Alternate direction of tile pattern for each abutting tile in line. Fit tightly and accurately to vertical surface, floor plates, thresholds and edging strips with clean cuts.
3. Lay in color patterns, as shown on Drawings.
4. Cut in game striping where indicated. Verify exact layout and colors prior to start of work.
5. Roll immediately with 100 pound roller.

D. Installation of Reducers, Adaptors, and Transitions: Provide at all unprotected edges of floor covering or where floor covering transitions. Thickness to match adjacent material. Where edge strips occur at door openings, center directly below door in closed position.

3.4 FIELD QUALITY CONTROL

A. Dry or Wet Slip Resistance:

1. Flooring, after application of any site-applied finishes, shall be tested using ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
   a. Pendulum Test Value (PTV) shall be 45 or greater under dry and wet conditions.
   b. Individual tests shall be made for each concrete substrate texture.
   c. Test results shall be reported in writing.
2. Alternative test method, such as use of a BOT-3000E digital tribometer, if proposed, shall provide results for both wet and dry conditions.

3.5 CLEANING AND PROTECTION

A. General:

1. Remove excess adhesive from walls and floors.
2. Clean up debris and remove from site.

B. Protect installed resilient flooring until Substantial Completion.

1. Provide a temporary non-staining paper pathway in all traffic areas.

C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient base.
2. Resilient molding accessories.

1.2 RELATED REQUIREMENTS

A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

C. Section 01 4520, Concrete Floor Moisture Content and pH Testing, for concrete substrate moisture content testing.

D. Section 09 6500, Resilient Flooring.

1.3 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. ASTM International:

1. D412: Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
2. D2047, Standard Test method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
3. D2240: Standard Test Method for Rubber Property-Durometer Hardness.
4. D3389: Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform Abrader).
5. D4258: Standard Practice for Surface Cleaning Concrete for Coating.
6. D4259: Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application.
7. E84: Standard Test Method for Surface Burning Characteristics of Building Materials.
8. E648: Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
9. E662: Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

10. F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
11. F1861: Standard Specification for Resilient Wall Base.
12. F2169: Standard Specification for Resilient Stair Treads.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

B. Pre-Installation Meeting: Conduct at Project site in accordance with associated flooring product specifications.

1.5 ACTION SUBMITTALS

A. Shop Drawings: For resilient base and floor transitions at locations and conditions not shown or indicated on the Drawings.

1. Include fully dimensioned flooring layouts for transitions indicating adjacent materials where applicable.
2. Show elevations of surfaces to receive base and including columns, enclosing partitions, built-in furniture, and casework. Note base height and profile.

B. Product Data: Manufacturer’s descriptive literature for each type of product to be provided to demonstrate compliance with specified attributes.

1. Include manufacturer's standard color charts showing full range of colors and patterns available for each type of product required.
2. Where color has been specified, clearly mark the color to be provided.
3. Identify each product using same designations indicated on Drawings.

C. Samples:

1. Resilient Products:
   a. Base: 12 inches long.
   b. Resilient Molding Accessories: 12 inches long.
2. Unless color is specified, submit manufacturer's full range of colors for each type of resilient product for Architect's selection. Architect may select more than one color.

1.6 INFORMATIONAL SUBMITTALS

A. Sample of manufacturer’s warranty.

B. Record of Pre-Installation Meeting.

C. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
   b. Resilient Materials: Documentation or Certification that products meet the pollutant emission limits from one of the sources specified in Section 01 6116.

1.7 CLOSEOUT SUBMITTALS

A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

B. Maintenance Data: To include in maintenance manuals.

C. Specified maintenance materials.

1.8 MAINTENANCE MATERIALS SUBMITTAL

A. Resilient Base: Furnish 1 percent one full roll additional rubber base from same lot of each color utilized, 500 linear feet minimum.

1. Mark boxes with manufacturer's name and color pattern.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for resilient product installation indicated.

B. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

C. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.

D. Materials, components, assemblies, workmanship and installation are to be observed by the Project Inspector. Work not so inspected is subject to uncovering and replacement.

E. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Coordinate mockups in this Section with mockups specified in other Sections.

1.10 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in original factory wrappings and containers, labeled with identification of manufacturer, brand name, and lot number.

B. Store materials in protected, clean, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.

C. Transport, store and handle in strict accordance with manufacturer's written recommendations.

1.11 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 degrees F or more than 85 degrees F, in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 degrees F or more than 85 degrees F.

C. Do not apply materials on wet or damp surfaces.

D. Install resilient products after other finishing operations, including painting, have been completed.

E. Close spaces to traffic during resilient flooring installation and for 48 hours afterwards.

1.12 WARRANTY

A. Manufacturer: In addition to the Contractor’s and Subcontractor’s Guarantee, furnish Owner with manufacturer’s fully executed written warranty for the following types of resilient material against defects in material and workmanship.

1. Stair Treads: 5 years.
2. Base and Accessories: 2 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Fire Resistance:

1. Critical Radiant Flux: Class 1 (minimum 0.45 watt per square centimeter) in accordance with ASTM E648 and NFPA 253.
2. Smoke Density: 450 or less per ASTM E662 and NFPA 258.

B. Sustainable Design:

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.
2. Resilient flooring material must comply with one of the certification and compliance programs specified in Section 01 6116.

2.2 RESILIENT BASE

A. Vulcanized Thermoset Rubber Base: PVC free complying with ASTM F1861, Type TS, Group 1; “Pinnacle Rubber Wall Base” by Roppe Corporation as specified and the basis of design, or equal.

1. Profile: Standard Cove.
2. Gauge: 1/8 inch.
3. Height: 6 inches.
4. Length: 120 foot coils.
5. Colors: As selected by Architect from manufacturer’s full range.
6. Flammability: Class B when tested in accordance with ASTM E84, NFPA 255.

B. Corners: Job-formed. Cope inside corners and wrap outside corners.

1. Factory pre-formed corners are not acceptable.

2.3 RESILIENT MOLDING ACCESSORIES

A. Reducers, Adaptors, and Transitions: Rubber edge guard threshold adapters & transitions.

1. Manufacturer and color to match manufacturer and color of wall base.
2. Rubber material and thickness to match adjacent material; tapered or bullnose edge.

2.4 ADDITIONAL MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: VOC compliant, water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

C. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation of flooring in areas of discrepancy until all such discrepancies have been resolved and all unsatisfactory conditions have been corrected.

D. Substrate Testing for Resilient Stair Accessories: Installer to obtain Moisture Content/pH Testing results and acknowledge, in writing, that the report has been received and approved. Installation of resilient stair accessories may not begin without this review and approval.

E. Start of installation indicates Installer's acceptance of substrate surfaces and conditions.

3.2 INSTALLATION, GENERAL

A. Do not install resilient products until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

B. Comply with manufacturer's installation instructions.

3.3 RESILIENT BASE INSTALLATION

A. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

B. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

1. Minimum piece length 24 inches.

C. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

D. Do not stretch resilient base during installation.

E. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

F. At gypsum board and fiberboard walls, fill voids at wall/floor intersection fully before installing base to provide complete backing of base. Do not install base with gap; this will result in deformation by furniture and will require removal and replacement of base.

G. Coped Inside Corners: Cut first piece square to the corner. Undercut and scribe the adjacent piece to the corner, attach in accordance with manufacturer's instructions.

H. Wrapped Outside Corners: With top set gauge, remove portion of back side of base to the bend. Make two relief cuts, one on each side of the bend at the bottom of the base. Remove a tapered piece from the bottom of the toe. Attach per manufacturer's

3.4 RESILIENT MOLDING ACCESSORIES INSTALLATION

A. Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

B. Where edge strips occur at door openings, center directly below door in closed position.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from exposed surfaces.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

E. Cover resilient products subject to wear and foot traffic until Substantial Completion.

1. Provide a temporary non-staining paper pathway in all traffic areas.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Painting and painter's finish on all exposed exterior and interior surfaces, except prefinished items and unless otherwise noted, as required to complete finishing of the Work. The Work includes, but is not necessarily limited to, the following specific items:

1. Paint, stain or otherwise finish all new surfaces.
2. Back priming of concealed surfaces, except as otherwise specified.
3. Paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work of this Contract.
4. Paint site items which are not prefinished, including posts, screens, panels, bollards, supports, rails and other similar improvements.
5. Mechanical and plumbing vents on roof.
6. Unpainted or unfinished exposed building components, pipes and conduit, including sprinkler piping, and metal ductwork, which run exposed across finished or painted surfaces.
7. Painting work in rooms where finishing work is performed, including painting new surfaces as specified and re-painting existing surfaces within the room, unless otherwise indicated. Re-painting existing surfaces shall be with minimum of one coat using specified coatings compatible with existing.

B. Surface treatment, priming and coats of paint specified in this Section are in addition to shop priming and surface treatment specified under other Sections unless otherwise noted.

C. Items Not Included in This Section:

1. Factory and shop-prefinished items as specified in various Sections.
2. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to shop priming.

1.2 WORK NOT TO BE PAINTED UNLESS OTHERWISE INDICATED

A. Exposed exterior concrete and concrete slab surfaces, except as noted.

B. Unfinished masonry, except where noted.

C. Suspended acoustical ceilings and acoustical tile, except as noted.

D. Pre-finished casework and other factory and shop-prefinished items as specified in various Sections.

E. Finish hardware except prime coated items.

F. Items typically not to be painted including, but not limited to, the following:

1. Glass.
2. Ceramic tile.
3. Membrane roofing.
4. Safety nosings.
5. Resilient floor covering and base.
6. Carpet.
7. Pre-finished paneling.
8. Plastic laminate.
9. Porcelain enamel.
10. Vinyl wallcovering, except where noted.

G. Aluminum doors, windows, frames and railings.

H. Metal or plastic toilet partitions.

I. Items of chromium, copper, nickel, brass, bronze or stainless steel.

J. Surfaces in concealed areas such as furred spaces.

K. Tops of gravel stop flanges (including priming) where roofing material will be adhered to.

L. Wall areas concealed by cases, counters, cabinets, chalkboards, tackboards (prime coat only required).

M. Piping or conduit including brackets and similar items therewith running on or across unpainted or otherwise unfinished walls or ceilings**.**

N. Galvanized gratings, recessed foot grilles, and thresholds.

O. Structural steel scheduled to receive fireproofing.

P. Existing rooms or areas not affected by work of this project, unless specifically noted otherwise.

1.3 RELATED REQUIREMENTS

A. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

C. Section 02 2626, Lead Assessment.

D. Divisions 22, 23 and 26, Exposed piping, ductwork and conduit.

1.4 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. ASTM International (ASTM):

1. D523: Standard Test Method for Specular Gloss.
2. D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
3. D6386: Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
4. D7396: Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting.

D. Master Painters Institute (MPI):

1. Architectural Painting Manual Guide Specification.

E. The Association for Materials Protection and Performance (AMPP):

1. SSPC-Society for Protective Coatings/ National Association of Corrosion Engineers International (NACE):
   a. SSPC-SP 1: Solvent Cleaning.
   b. SSPC SP-10/NACE No. 2: Near-White Metal Blast Cleaning.
   c. SSPC-SP 16: Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirement of Section 01 8113, Sustainable Design Requirements.

1.6 ACTION SUBMITTALS

A. Product Data: Submit list and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty or guarantee, and application instructions. Cross-reference to paint system and locations of application areas.

B. Samples:

1. Appropriately label and identify each sample, including location and application. Include Architect's number as scheduled on the Drawings, manufacturer's name, color number, and gloss units.
2. Prepare on 8 inch x 10 inch card stock for selected colors and finishes.

3. Submit sufficiently ahead of work progress to allow for color board assembly and distribution.
4. Resubmit as requested until required sheen, color, and texture are approved.

1.7 INFORMATIONAL SUBMITTALS

A. Statement of applicator qualifications.

B. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.8 CLOSEOUT SUBMITTALS

A. Guarantee: Submit Subcontractor’s guarantee.

B. Specified maintenance materials.

1.9 MAINTENANCE MATERIAL SUBMITTALS

A. At completion of the Work, deliver to Owner extra stock of paint of each color used in each coating material used.

B. Containers shall be full, tightly sealed, and clearly marked.

C. Provide the following quantities:

1. Field Colors: 1 five-gallon container.
2. Accent Colors: 1 one-gallon container.

1.10 QUALITY ASSURANCE

A. Use only new materials and products.

B. Single-Source Responsibility:

1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
2. For each individual system:
   a. Provide primer and other undercoat paint produced by same manufacturer as finish coat.
   b. Use thinner within manufacturer's recommended limits.

C. Source Quality Control: Material shall be best grade products of type specified and listed below as regularly manufactured by these manufacturers. Materials not bearing manufacturer's identification as standard "best grade product" of their regular line will not be considered for use.

D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

E. Materials and application procedures shall comply with local, state and federal air pollution control regulations.

F. Manufacturer's representative from coating supplier shall visit the site prior to application to review and approve the specified systems. Discrepancies or recommended changes shall be submitted to the Architect for consideration prior to finalization of submittal.

G. Site Application Mockup:

1. Prior to ordering materials and unless waived by the Architect in writing, the Contractor shall provide large scale mockup areas for all colors, both interior and exterior, directly applied to the building for final color approval by the Architect.

2. Minimum Size:
   a. Ceiling Areas: Finish a panel 10 feet square.
   b. Wall Areas: Finish a panel 8 feet long by full height of wall.
   c. Finish a portion of other items as directed by Architect.

3. Provide up to 2 adjustments at no extra cost to the Owner.

4. Paint shall not be ordered or applied until such large scale sample(s) have been reviewed and approved by the Architect in writing. These requirements as described herein may be waived by the Architect in writing only.

1.11 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

B. Store materials in protected, clean, dry conditions off of ground and in areas which will not interfere with the progress of the Work.

C. Transport, store and handle in strict accordance with the manufacturer's written recommendations and as specified below.

D. Remove paint-soiled rags and waste from premises at end of each day's work or store in metal containers with metal covers.

E. Paint stored at site, shall be in separate structure not less than 60 feet from any other building or structure. Remove empty containers and soiled rags as they accumulate. At completion, remove structure, cleanup area, and leave in original condition.

1.12 FIELD CONDITIONS

A. Do not apply paints and coatings under conditions which jeopardize quality or appearance of painting or finishing.

B. Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.

C. Exterior:

1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be stored and applied.
2. Do not apply exterior paint when air or surface temperature is under 50 degrees F or when air or surface temperature will be below 50 degrees F for 48 hours after painting.
3. Do not apply immediately following snow, rain, dew or during foggy weather.
4. Do not apply when temperature is over 85 degrees F except in protected or shaded areas.

D. Interior:

1. Do not apply interior paint when air or surface temperature is below 50 degrees F unless temperature is maintained constantly.
2. Do not apply when ventilation is inadequate to maintain humidity lower than dew point of coldest wall.

E. Use moisture meter for determining proper moisture levels of surfaces for painting.

F. Report to Architect in writing upon discovery of any prime coat painting specified in other Sections of Specifications that would prevent proper application of specified finish.

G. Furnish, erect and remove scaffolding and planks required for work under this Section. Conform to state and local codes, rules and regulations.

1.13 EXISTING CONDITIONS

A. Existing Surfaces:

1. Paint or otherwise finish all existing surfaces as indicated or scheduled on the Drawings.
2. Work includes primer, paint, repaint or finish of existing painted surfaces altered, defaced or damaged as a result of work under this Contract.]

B. Existing surfaces with paint, or similar type coating shall be assumed to contain various concentrations of lead. Cal/OSHA regulations are therefore applicable during disturbance, preparation or repainting of these surfaces.

C. Existing surfaces to be painted include:

1. Exterior wall surfaces, including fascia, trim.

2. Soffits and exterior ceilings including exposed roof framing.
3. Doors and frames, both wood and metal.
4. Window frames, trim and solid infill panels except unpainted or prefinished aluminum.
5. Exposed conduit, piping, brackets, supports, and similar metal fabrications.
6. Downspouts and gutters.
7. Parapet caps and exposed flashings.
8. Mechanical well walls, all surfaces.
9. Concrete foundation where exposed below painted wall surfaces.
10. Closure panels between relocatable buildings.
11. Enclosure walls, screen walls, equipment yards.
12. Other work as shown on the Drawings, specified, or as required for a complete Project.

1.14 GUARANTEE

A. Contractor: Under conditions of its Guarantee under the Contract, paint colors shall be substantially unchanged and finishes shall maintain their original adherence without showing blisters, flaking, peeling, scaling, staining or unusual deterioration or other defects.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Sustainable Design:

1. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MANUFACTURERS AND COATING PRODUCTS

A. Products are specified under "Paint Systems" in Part 3 below and are manufactured by Kelly-Moore, except as otherwise indicated. Equivalent products to those scheduled manufactured by Sherwin-Williams, Dunn-Edwards, or equal, are acceptable.

B. Materials selected for coating systems for each type surface shall be the product of a single manufacturer or shall be acceptable to manufacturer of finish coating for system.

C. If more than one quality level of product type is marketed, use material of highest quality.

2.3 MIXING AND TINTING

A. Deliver paints and stains ready mixed to jobsite. On-site color mixing or tinting will not be allowed.

B. Each kind of coating for paint finishes shall be factory-mixed to match approved samples, colors, and ready for immediate application.

C. Mix proprietary products in strict accordance with manufacturer's printed directions.

D. Thinning, if permitted by manufacturer for a specific coating, shall be in accordance with manufacturer's instructions. Thinning of other products shall be in accordance with standard practice.

2.4 COLORS

A. Architect will prepare a color schedule with samples for guidance of painter and reserves right to select, allocate, and vary colors on different surfaces throughout building.

1. Colors selected by Architect may be from manufacturer's full range standard palette or be custom mixed.
2. Unless otherwise indicated on the Drawings, different colors will be selected for different materials such as walls, trim, and doors.

B. Colors to be selected by the Architect, or where scheduled on the Drawings, are solely for the purpose of conveying color information and do not imply manufacturer's approval or waiver of the requirement that all coatings be from the same manufacturer, unless a specific system is not available from the primary manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to the work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this work may properly commence.

B. Verify that painting may be performed in accordance with the approved design.

C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

A. General:

1. Surface preparation and product application shall be in accordance with manufacturer's printed instructions.
2. In addition to prime coats indicated (primer, sealer, filler, undercoat), use two finish coats minimum, and additional coats as required for complete coverage and good appearance of scheduled finish coat.
3. Surfaces to receive new finish shall be properly prepared prior to application of finish coatings.
4. Do not apply paint, enamel, stains or varnishes to wet, damp, dusty, finger-marked, rough, unfinished, or defective surfaces until such defects have been corrected.

B. Metals-General:

1. On metal work, only such sanding will be required as is necessary to provide for complete bonding of coats.
2. Steel and ironwork shall be scraped clean of scale, and rust and any grease shall be entirely removed.
3. Touch-up scratched and damaged places on metal priming coats.
4. Galvanized or zinc-coated metal shall be given an approved acid treatment 48 hours before paint is applied.
5. Prep and prime coat factory or shop primed metal products, including metal doors and frames, exposed framing, and other exposed metal if material was not shop primed.
6. Metal surfaces receiving epoxy coatings shall have stripe coat applied at all welds, edges, joints, etc., with epoxy primer prior to application of primer.

C. Metals–Galvanized Surfaces:

1. Surfaces shall be cleaned, and profiled where specified, prior to receiving applied coatings in accordance with ASTM D6386 or ASTM D7396 for sheet products.
   a. Methods shall be selected based on age of galvanized coating, condition of surface and intended paint coating.
   b. Care shall be taken not to damage the zinc coating.
   c. Do not use phosphate treatment on galvanized surfaces scheduled to receive zinc-rich primers.
2. Comply with additional recommendations included in the AGA document “Duplex Systems: Painting Over Hot Dip Galvanized Steel.”
3. Comply with any additional procedures required by the coating manufacturer.

D. Surfaces that cannot be prepared or painted as specified, or to level required by the coating manufacturer, shall be immediately brought to the attention of the Architect, in writing.

1. Starting of work without such notification will be considered acceptance by the Contractor of surfaces involved.
2. Replace unsatisfactory work caused by improper or defective surfaces, as directed by Architect.

3.3 REPAINTING EXISTING INTERIOR SURFACES

A. Interior surfaces required to be repainted, shall be prepared as follows.

1. Wash clean with solution of trisodium phosphate in water and thoroughly rinse or wash with approved self-neutralizing detergent.
2. Spackle, patch, sandpaper, repair, spot or partially prime to provide "hold out" for finish coats of paint and otherwise properly prepare as necessary to provide suitable surfaces, reasonably equal to new, over which to apply specified paints.

B. Wall Covering:

1. Check wall covering for adhesion. Loose seams and/or edges shall be reattached prior to painting.
2. Holes, cracks and imperfections shall be filled flush with surface.

3.4 REPAINTING EXISTING EXTERIOR SURFACES

A. General:

1. Exterior surfaces required to be re-painted, shall be power washed with surfactant, followed by rinsing to remove all loose coatings, chalk, dirt, efflorescence, oils, and other contaminants that would inhibit bond of new coating.
2. Mold or mildew shall be treated with bleach solution followed by thorough rinsing.
3. Protect openings into interior spaces during power washing including louvers, vents, vent screeds, grilles, to prevent water from entering interior areas including, attics and soffits.

B. Ferrous Metal: Steel framing, metal doors and frames, louvers, metal ductwork, and similar Items:

1. Remove all flaking, peeling and poorly bonded coatings, including rust from metal surfaces using power tool sanders or equivalent equipment. Feather edge remaining coatings.
2. Solvent scrub with MEK, all exposed bare metal, shop applied pretreatment and chalked coatings.
3. Spot prime exposed bare metal and metal pre-treatment prior to application of specified prime coat.

C. Galvanized Metal: Down spouts, wall caps, and Other Exposed Galvanized Metal.

1. Remove all loose, flaking or peeling coatings by scraping, chipping or sanding. Feather all rough edges by sanding.
2. Apply phosphoric acid etch pre-treatment to exposed galvanized metal.

D. Plaster and Concrete Masonry:

1. Remove loose coatings using hand or power tools.
2. Patch plaster areas where original material has cracked, spalled or otherwise been removed with compatible material. Fill areas completely to provide smooth, even surface for refinishing. Spot prime patches prior to proceeding.
3. Patch masonry joints with cracks or missing material with compatible materials.

E. Wood Siding and Trim:

1. Remove loose, flaking or peeling coatings by scraping, chipping or sanding. Feather rough edges by sanding.
2. Surfaces that exhibit moderate to heavy chalk deposits shall be thoroughly cleaned to sound substrate by wire brushing, sanding, or power washing.
3. Spot prime bare wood, exposed nail and fastener heads prior to application of specified prime coat.

4. Glossy surfaces shall be dulled by sanding. Crystalline deposits shall be removed by flushing with water from a hose.
5. Mildew, if present, shall be removed by scrubbing with a commercial mildew wash in accordance with manufacturer's directions.

F. Concrete:

1. Existing exposed concrete scheduled to receive new finish shall be pressure washed or scrubbed to completely remove all bond breakers and oils.
2. Remove loose coatings not removed by pressure washing using hand or power tools.
3. Efflorescence to be removed following procedures recommended by the paint manufacturer.
4. Cracks, gaps, hollow areas, bug holes, honey combs, voids, fins, form marks and other protrusions or rough edges are to be ground or stoned to provide a smooth continuous surface.
5. Imperfections may require filling.
   a. Patch concrete areas with cracks, gaps, hollow areas or other imperfections with compatible material to provide smooth continuous surface.
   b. Material shall be compatible with and as recommended by paint manufacturer.
6. Test for moisture as specified for new concrete.
7. Surface shall be reviewed by Architect after patching is complete and primer is applied. Additional patching and/or grinding necessary to provide a visually acceptable surface shall be accomplished at no additional cost.

G. Porcelain enamel panels

1. Thoroughly clean surface.
2. Scuff, sand and wipe down surface.
3. Text patch surface prior to painting.

3.5 CAULKING

A. Caulk all cracks in finished surfaces.

B. Seal around any wall openings where original sealant is not fully sealing.

C. Provide 3/8 inch sealant around all steel columns at concrete base prior to painting.

D. Provide sealant at material transitions and intersections as required.

3.6 PROTECTION

A. Hardware, fixture canopies, outlet covers, switch plates and other such items shall be removed or loosened and replaced after completing work as required for painting and finishing. Protect items until reinstalled.

B. Protect work and work of others during progress against damage. Leave such work clean and whole. Correct damage by cleaning, repairing, replacing or repainting as directed.

C. Provide necessary drop cloths for protection of work. Cover finished surfaces adjacent to work.

3.7 APPLICATION

A. General:

1. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.
2. Apply coatings in accordance with manufacturer's recommendations and the additional requirements, as applicable, of the Architectural Painting Manual Guide Specifications for application methods and paint systems.
3. Flow coat on evenly and well brushed in. Should dead spots occur, touch-up before next coat is applied. Should spots or cracks burn through after final coat is applied, apply additional coats to entire surface as necessary to remedy defects.
4. Rate of application shall be within limits recommended by paint manufacturer for surface involved.

B. Thicknesses: Rate of application shall be within limits recommended by paint manufacturer for surface involved and comply with the following.

1. Paint materials shall be applied in manner to average 1.5 to 3 Dry Mils in thickness for the total number of coats scheduled.
2. Provide Tooke Dry Mill Coating Inspection Gauge manufactured by Micro Metrics Company to the Project Inspector for inspection of finished coating systems, if requested.

C. Refinish whole area where portion of finish is not acceptable.

D. Adjust natural finishes as necessary to obtain identical appearance on veneers and solid stock.

E. Equipment adjacent to walls shall be disconnected, using workers skilled in appropriate trades, and moved to permit wall surfaces to be painted. Following completion of painting, they shall be expertly replaced and reconnected.

F. Top and bottom edges of all doors shall receive same paint system finish required for door faces.

G. Do not paint over fire-rating labels, fusible links, or sprinkler heads.

3.8 DEFECTIVE WORK

A. Painter shall be responsible for damage or unsuitable work, including that caused by improperly prepared surfaces. Refinishing shall be at no cost to the Owner. Repair work damaged during construction; touch-up or refinish as necessary any abraded, stained or otherwise damaged surfaces.

3.9 CLEANING AND PROTECTION

A. Thoroughly clean any drips, splatters, spills, splashes, etc., from walls, floor or other surfaces, with no damage to those surfaces.

B. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.

C. In the event of damage, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

3.10 PAINT SYSTEMS

A. General:

1. Only major areas are scheduled, but miscellaneous and similar items and areas within room or space shall be treated with suitable system.
2. This Specification shall serve as guide and is meant to establish procedure and quality. Confer with the Architect to determine exact finish desired.
3. Number of coats scheduled is minimum. Additional coats shall be applied at no additional cost as required to hide base material completely, produce uniform color, and provide required and satisfactory finish.

B. Gloss and Sheen Ratings: Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following limits in conformance with Master Painters Institute, Inc. (MPI) Standards according to ASTM D523. Not all of the Gloss Levels are necessarily scheduled or used on this Project.

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 max.
G2	Velvet finish	0 to 10	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to 35	35 min.
G5	Semi-Gloss finish	35 to 70	
G6	Gloss finish	70 to 85	
G7	High-Gloss finish	> 85	

C. Clarification of System Terminology:

1. Interior paint Systems are specified and identified herein by initial letters “INT.”
2. Exterior paint Systems are specified and identified herein by initial letters “EXT.”
3. The numbers following “INT” and “EXT” for each System identifies the substrate to be coated.
4. Initial numbers for each System identify the substrate to be coated summarized as follows with further clarification included with the System description:

CODE	DESCRIPTION
3.1	Concrete

CODE	DESCRIPTION
3.2	Cement Plaster
4	Masonry
5	Metal
6	Wood
9.2	Gypsum Board
9.3	Acoustical Panels and Tile

5. The letter following substrate number identifies the general finish coat chemistry summarized as follows:

CODE	DESCRIPTION
A	Standard acrylic
B	Non-bridging vinyl acrylic
C	Epoxy-like acrylic
D	Semi-transparent stain
E	Elastomeric
F	High performance epoxy-like acrylic
G	Lacquer
H	Aliphatic urethane
I	Fire Retardant Intumescent
J	Acrylic Urethane
K	PVA primer
L	Acrylic primer
M	Premium performance acrylic polymer

6. Hyphenated suffix identifies the topcoat gloss level.

3.11 INTERIOR PAINTING SYSTEMS

INT 3.1A-3
Acrylic on Concrete - Gloss Level 3

1 coat		971 AcryPlex	Vinyl Acrylic Primer (if not previously painted)
2 coats	1010 Premium Professional		Latex Eggshell

INT 5.1A-5
Acrylic on Exposed Steel, Not Shop Primed - Gloss Level 5

1 coat		5725 DTM	Acrylic Primer
2 coats	1050 Premium Professional		Latex Semi-Gloss

Note: Modify scheduled finish coat if lower gloss level is selected by Architect.

INT 5.2A-5
Acrylic on Shop Primed Metal Including Hollow Metal Doors & Frames - Gloss Level 5

2 coats	1050 Premium Professional	Latex Semi-Gloss

Note: Modify scheduled finish coat if higher or lower gloss level is selected by Architect.

INT 6.4A-5
Acrylic on Plywood - Gloss Level 5

1 coat		973 AcryPlex	Acrylic Primer
2 coats	1050 Premium Professional		Latex Semi-Gloss

INT 9.2A-3
Acrylic on Gypsum Board, textured finish - Gloss Level 3

1 coat	971 AcryPlex	PVA Primer/Sealer
2 coats	1010 Premium Professional	Latex Eggshell

INT 9.3B-1
Acrylic on Acoustic Panels and Tiles - Gloss Level 1

1 coat	1005 Ceiling Paint	Non-Bridging Vinyl Acrylic Flat

3.12 EXTERIOR PAINTING SYSTEMS

EXT 3.1A-2
Acrylic on Concrete - Gloss Level 2

1 coat	247 AcryShield	Acrylic Masonry Primer
2 coats	1210 Premium Professional	100% Acrylic Low Sheen

EXT 3.2A-2
Acrylic on Cement Plaster - Gloss Level 2

1 coat	247 AcryShield	Acrylic Masonry Primer
2 coats	1210 Premium Professional	100% Acrylic Low Sheen

EXT 4.1A-2
Acrylic on Concrete Unit Masonry - Gloss Level 2

1 coat	247 AcryShield	Acrylic Masonry Primer
2 coats	1210 Premium Professional	100% Acrylic Low Sheen

EXT 5.1A-5
Acrylic over Unprimed Steel - Gloss Level 5

1 coat	5725 DTM	Metal Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

EXT 5.2A-5
Acrylic over Shop Primed Metal Doors and Frames, Steel Frame, Mechanical and Electrical Equipment, and Panels - Gloss Level 5

2 coats	2888 DuraPoxy HP	Acrylic Urethane Semi-Gloss

EXT 5.3A-5
Premium Acrylic over Waterborne Primer on Galvanized Metal – Gloss Level 5

Pretreatment	SSPC SP-1	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

EXT 5.4A-5
Acrylic over Waterborne Primer on Aluminum – Gloss Level 5

Pretreatment	Devoe Devprep 88	Heavy-duty cleaner
1 coat	5725 DTM	Acrylic Primer
2 coats	1215 Premium Professional	100% Acrylic Semi-Gloss

Note: Provide pretreatment and primer if preparation and primer not applied in shop.

EXT 5.6A-5
Acrylic over Porcelain Enamel Panels

1	coat	Monochem	MonoBond Bonding Primer
2	coats	1250 Acryshield	100% Acrylic Semi-Gloss

3.13 MISCELLANEOUS PAINTING

A. Mechanical and Electrical Equipment, Conduits and Piping: Paint exposed items as scheduled using appropriate system for material and whether or not item has been factory-primed.

B. Exposed Insulation-Covered Piping: Size with Arabol, or equal latex type adhesive, and apply 2 coats of semi-gloss enamel.

C. Material Visible through Grilles, Screens, Louvers, Vents and Screens and Exposed Hardware Cloth Screening: Painted flat black to make them as unnoticeable as possible.

D. Mechanical Equipment: Paint mechanical equipment housings where indicated on the Drawings.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plastic signs at building entrances, classrooms, restrooms, and as identified on drawings.

B. Related Sections:

1. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.
2. Section 01 1616, Volatile Organic Compound (VOC) Restrictions: for VOC limits pertaining to adhesives, sealants, fillers, primers and coatings.
3. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

1.2 REFERENCES

A. Accessible signs shall conform with the following requirements as indicated:

1. California Building Code (CBC) Title 24, 2022 Edition.
2. ADA Accessibility Guidelines (ADAAG, latest adopted edition).
3. Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required (CBC Section 11B-703.3 Braille).
4. Means of Egress Identification: CBC 11B-216.1 &11B-703.1.
5. Tactile Exit Signs: CBC 1013.4.
6. Restroom Identification Symbols: CBC 11B-216.8 &11B-703.7.2.6.
7. Signs and Identification: CBC 11B-216.1 &11B-703.1.
8. International Symbol of Accessibility: CBC 11B-703.7.2.1.
9. Direction and Information Signs: CBC 11B-703.1.
10. Symbols of Accessibility: CBC 11B-703.7.
11. Finish and Contrast: CBC 11B-703.5.1.
12. Character Proportions: CBC 11B-703.2.4.
13. Character Height: CBC 11B-703.2.5.
14. Raised Characters and Pictorial Symbol Signs: CBC 11B-703.2 & 11B-703.6.
15. Braille: CBC 11B-703.3.
16. Mounting Height and Location: CBC 11B-703.4.1 & 11B-703.4.2.
17. Symbols of Accessibility: CBC 11B-703.7.2.
18. Color of Symbol: CBC 11B-703.7.2.1.
19. Entrance Signs: CBC 11B-216.6.

B. ASTM D4802 - Standard Specification for Poly(Methyl Methacrylate) Acrylic Plastic Sheet.

C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless-Steel Sheet, Strip, Plate, and Flat Bar.

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Shop drawings listing sign styles, lettering and locations and overall dimensions of each sign.

C. Two (2) samples illustrating full size sample sign with tactile characters, Braille and subsurface text or pictogram to demonstrate fabrication technique and Braille measurements which shall be used on proposed project.

D. Letters samples: 1-inch-high letters for proportions required in REGULATORY REQUIREMENTS.

E. Submit manufacturer’s technical data and installation for each type of sign required.

F. Submit samples of background colors, character colors, and one-inch high print outs of "I," "O" and "X" from proposed type styles. Indicate which type styles shall be used for required tactile characters and for required visual characters.

G. Submit proposed sign schedule to comply with scoping requirements above.

H. All signage shall be designed and constructed to comply with signage specifications and drawings.

1.4 QUALITY ASSURANCE

A. Pre-installation Meeting

1. Notify Architect when signs are ready for installation. Arrange for conference at job site. Do not proceed with installation until Architect's approval of specific locations and methods of attachment has been obtained.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site and protect from damage. Store until immediately prior to Notice of Completion.

B. Manufacturers shall submit 3 references showing products for projects completed within the last 6 years. Both tactile and non-tactile signage shall be included in the work.

C. Manufacturer's Two-Year Warranties.

D. Contractor shall provide labor and materials to repair or replace defective signs as directed by Owner. Defects shall include:

1. Tactile characters and/or Braille dots which come off or are removed.
2. Discoloration, wear and scratching off of the surface color.
3. All signs and sign components, except for damage by mishandling by Owner, including installation by Owner, or vandalism.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products of following manufacturers form basis for design and quality intended.

1. Gravotech. www.gravotech.com
2. Or approved equal.

2.2 MATERIALS

A. Plastic Signs

1. ADA Tactile and Braille Signs: Sand-Carved signs; thermosetting high-pressure laminate using Graphic Process Sand-Carved signs, exterior-grade, graphics, Braille and tactile copy required. Square corners, square cut edges.
   a. Unframed Signs: GTAC-INT sign material as manufactured by Gravotac. Sized as required for text or room number.
   b. Framed Signs: Single piece Modular Frames, concealed screw mounting, by Gravotac or equal.
   c. ADA TactManufacturer's standard process for producing copy complying with CBC and ADA Accessibility Guidelines. Text shall be accompanied by California Grade 2 Braille. Produce precisely formed characters with square cut edges free from burrs and cut marks, permanently fused to substrate.
   d. Raised-Copy Thickness: Not less than 1/32 inch.
2. Non-Tactile Signs: Cast Acrylic Plastic Sheet; ASTM D4802 Category A-1, ¼ inch overall thickness, laminated acrylic plastic sheets, Sub-surface Screened process graphics and symbols, exterior-grade at exterior locations, square corners, square cut edge, drilled holes for countersunk screws, polished edges.
   a. Unframed Signs: as noted above.
   b. Framed Signs: 1/16 inch thick aluminum. Square radius corners.
   c. Finish: black.
3. Apply UV inhibitor overcoat for exterior signs.

B. Fasteners: Stainless steel screws, flat head, pin-in-head torx screws for vandal-proof and clear silicone adhesive.

C. Lettering Type Style: Helvetica Regular, uppercase letters only, refer to REGULATORY REQUIREMENTS for letter-proportion compliance.

D. Restroom Signage

1. Male Restroom Signage:
    a. Doorways leading to male restrooms shall be identified by equilateral triangle 1/4 inch thick with edges 12 inches long, with vertex pointing upward in contrasting color from door color. Sign shall be mounted in center of door 60 inches from finish floor to center of sign.
    b. Room shall be further identified by rectangular room identification sign ¼ inch thick, 8 inch Height by 6 inch Length minimum unless indicated on Drawings upon which appears a male pictogram 6 inches high, and the word “MEN” immediately below on the same sign in contrasting color. Letters: 5/8 inches minimum and 2 inches maximum high in contrasting color, raised minimum 1/32 inch fully tactile, accompanied by the California Contracted Grade 2 Braille indicator immediately below. Sign shall be located on wall on latch side of door, 60 inches from finish floor to center of sign, centered horizontally within 18-inch space adjacent to latch side of door or on nearest adjacent wall.
    c. Conform to all CBC requirements, CBC 11B.703.1 and 11B-703.7.2.6.1.
2. Female Restroom Signage:
    a. Doorways leading to female restrooms shall be identified by circle 1/4 inch thick 12 inches in diameter circle in contrasting color from door color. Sign shall be mounted in center of door, 60 inches from finish floor to center of sign.
    b. Room shall be further identified by rectangular room identification sign 1/4 inch thick, 8-inch Height by 6-inch Length minimum unless indicated on Drawings upon which appears a female pictogram 6 inches high, and the word "WOMEN" immediately below on the same sign in contrasting color. Letters: 5/8 inches minimum and 2 inches maximum high in contrasting color, raised minimum 1/32 inch fully tactile, accompanied by the California Contracted Grade 2 Braille indicator immediately below. Sign shall be located on wall on latch side of door, 60 inches from finish floor to center of sign, centered horizontally within 18-inch space adjacent to latch side of door or on nearest adjacent wall.
    c. Conform to all CBC requirements, CBC 11B.703.1 and 11B-703.7.2.6.2.
3. Gender NEUTRAL Restroom:
    a. Doorways leading to unisex restrooms shall be identified by circle 1/4 inch thick, 12 inches in diameter with 1/4-inch-thick triangle superimposed on circle and within 12-inch diameter, total 1/2 inch thick in contrasting color from door color. Sign shall be mounted in center of door 60 inches from finish floor to center of sign. Color of triangle shall have 70 percent minimum contrast with color of circle.
    b. Room shall be further identified by rectangular room identification sign 1/4 inch thick, 8-inch Height by 6-inch Length minimum unless indicated on Drawings upon which appear as male and female pictograms and the word

"RESTROOM" immediately below on the same sign in contrasting color. Letters: 5/8 inches minimum and 2 inches maximum high in contrasting color, raised minimum 1/32 inch fully tactile, accompanied by California Contracted Grade 2 Braille indicator immediately below, on same sign. The sign shall be located on wall on latch side of door, 60 inches from finish floor to center of sign, centered horizontally within 18-inch space adjacent to latch side of door or on nearest adjacent wall.

c. Conform to all CBC requirement, CBC 11B.703.1 and 11B-703.7.2.6.3.

4. Restroom signs – Non-Wheelchair Accessible:
   a. Provide restroom signs with similar font, size and fabrication as accessible signs without the ISA (International Symbol of Accessible) and without tactile construction.
   b. Next to the Non-Wheelchair Accessible sign provide an additional sign same construction, with the wording: “WHEELCHAIR ACCESSIBLE RESTROOM LOCATED” with ARROW below the wording directing to the nearest location.
5. [Substitute "BOYS" or "GIRLS" where appropriate.]

2.3 FABRICATION

A. Regulatory Requirements

1. Tactile Character Type: Tactile characters on signs shall be raised 1/32-inch (0.794 mm) minimum, and shall be sans serif uppercase characters accompanied by Contracted (Grade 2) Braille. Helvetica Regular, uppercase letters only, refer to REGULATORY REQUIREMENTS for letter-proportion compliance. Italic, oblique script, highly decorative or unusual style forms not permitted. CBC Section 11B-703.2. Fabricate sign so that raised letter cannot be peeled off.
2. Character Proportions: Raised characters on signs shall be selected from fonts where the width of the uppercase letter “O” is 60 percent minimum and 110 percent maximum of the height of the uppercase letter “I”.
3. Tactile Character Height: Raised characters shall be a minimum of 5/8 inch (15.9 mm) and a maximum of 2 inches (51 mm) high. CBC Section 11B-703.2.5.
4. Stroke thickness of the uppercase letter “I” shall be 15 percent maximum of the height of the character. CBC Section 11B-703.2.6
5. Character spacing measured between the two closest points of adjacent raised characters within a message. Where characters have rectangular cross sections, spacing shall be 1/8 inch minimum and four (4) times the stroke width, maximum. Where characters have other cross sections, spacing between individual raised characters shall be 1/16 inch minimum and four (4) times the stroke width maximum at the base of the cross sections, and 1/8 inch minimum and four (4) times the stroke width maximum at the top of the cross sections. Characters shall be separated from raised borders and decorative elements 3/8 inch minimum.
6. Line Spacing: Spacing between the baselines of separate lines of raised characters within a message shall be 135 percent minimum and 170 percent maximum of the raised character height.

7. Finish and Contrast: Characters and their background shall have a non-glare finish. Characters shall contrast with their background. Provide white characters on Navy Blue background to match District standard.
8. Braille: California (Contracted) Grade 2 Braille. Dot base diameter shall be 0.059 inch (1.5 mm) to 0.063 inch (1.6 mm). Dots shall be 0.100-inch (2.5 mm) on center in each cell with 0.300-inch (7.6 mm) space between corresponding dots in adjacent cells. Distance between corresponding dots from one cell directly below, 0.395 to 0.400 inch. Dots shall be raised 0.025 to 0.037 inch above the background. Braille dots shall be domed or rounded.
9. Polish all edges.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive Work.

B. Beginning of installation means installer accepts existing surfaces.

3.2 INSTALLATION

A. Install signs only after surfaces are finished, in all restrooms, in center of door, or on wall adjacent to latch side as specified herein.

B. Mounting

1. Mounting Height and Location: Signs with raised characters and Braille shall be located 48 inches minimum to the baseline of the lowest line of Braille cells and 60 inches maximum to the baseline of the highest line of raised characters above the finish floor or ground surfaces. Mounting location shall be located so that a clear space of 18 inch minimum by minimum by 18 inch minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45-degree open position. CBC Section 11B-703.4.
2. Tactile Plastic Signs: Stainless steel screws (not just adhesive), pin torx, vandal-proof screw appropriate for substrate.
3. Non-tactile Plastic Signs:
   a. Install with four (4) stainless steel countersunk flathead screws, pin torx, vandal-proof. Pre-drill holes to prevent breaking plastic, use countersunk drill bits to flush screw head with sign surface.
   b. [Install with clear silicone adhesive meeting ASTM C834, with zero clearance between plastic and face of substrate. Double face adhesive tape not permitted].
   c. Metal Signs: Install with four (4) flathead countersunk No. 8 stainless steel vandal-proof screws at pre-drilled holes, top of screw heads shall flush with sign surface, concealed mounting.

C. Clean and polish.

3.3 3.03 FIELD QUALITY CONTROL

A. DSA Inspections: Signs and identifications or other information shall be field inspected after installation and approved by Division of the State Architect prior to the issuance of a final certificate of occupancy, or final approval where no certificate of occupancy is issued. The inspection shall include, but not limited to, verification that Braille dots and cells are properly spaced and the size, proportion and type of raised characters are in compliance with CBC, Section 11B-703.1.1.2.

END OF SECTION

PART 1 - GENERAL

1.1 ACCEPTABLE MANUFACTURER

A. Products of the following manufacturer or comparable, provided they comply with the following specifications and are considered functionally and physically similar/acceptable:

B. TekStar

1. Integrated LED Display Cabinets and Identification Cabinet with Support Structure
2. By: Stewart Signs
    a. 2201 Cantu Court, Sarasota, FL., 34232

1.2 QUALITY STANDARDS

A. Signage and work under this section shall be manufactured by vendors dealing extensively in this type of work and capable in producing first quality work

B. Signage provider shall have at least ten (10) years of experience providing LED products and services for other organizations

C. All work and installation shall be in accordance with the requirements of these specifications and manufacturer's recommendations. In the event of disagreement between these specifications and the manufacturer's recommendations, these specifications shall govern.

D. Entire unit, including the assembled product to include UL listing (NOT ETL only) and FCC Part 15 compliant

E. Made in the USA from domestic and foreign parts in one plant, Alabama

1.3 GENERAL SIGN CONSTRUCTION

A. Entire sign shall be manufactured by one manufacturer to include

1. Thermoformed Identification Sign Face
2. External Extruded Aluminum Cabinet
3. Internal LED Display Cabinet

B. Signage is to be an integration of 4 major components

1. External Identification Cabinet
    a. Cabinet Dimensions
        1) Active display area 4'-2"x11'-7" (48.5 SF per side)
        2) Double sided LED cabinet, size 4'-5"x11'-10"
    b. Cabinets constructed using 12" deep aluminum extrusions
        1) Extrusion Thickness – 0.156"

2) Double reinforced corners, internally welded

c. Hinged Sign Face(s)
   1) Allows access to internal lamps and ballast(s) without removing face(s)
   2) Concealed extruded aluminum hinges
   3) Cover supported with integrated props when open

d. DuPont TGIC Powder Coat Finish

e. Internally Illuminated
   1) LED tube lamping (110 volts – 277 volts)

C. Tuffak XL Sign Faces – Matte Finish

1. Entire Cabinet containing ID area & LED display is enclosed with Thermoformed, Tuffak XL sign face (UV / graffiti / vandal resistant)
2. Face decorated with second surface (inside), 3M High Performance Translucent vinyl for all name / logo graphics

D. Integrated internal LED Display Cabinets (proprietary design)

E. LED display cabinet is mounted inside the External Identification Cabinet, behind the Tuffak XL Sign Faces for protection against UV/graffiti/vandalism damage

1. Single-sided LED displays will have one internal LED Display Cabinet inside.
   a. LED Display Cabinet constructed using aluminum extrusions (not sheet metal wraps)
   b. Cabinets are weather resistant & placed inside the External Identification Cabinet for additional protection from the elements and a cleaner finished look.
2. Hinged cover allows access to internal electronic components without requiring the removal of LED modules

F. Forced Air Ventilation (heating and cooling protection)

1. Ventilation Fans are installed in both the Internal LED Display Cabinets and in the External Identification Cabinet.
2. LED cabinets shall have forced air ventilation

1.4 LED DISPLAY

A. Pixel Pitch: 10mm

B. LED Pixel Matrix: 128x352 (up to 16 lines of text)

C. Three (3) LEDs per Pixel: 1 red, 1 blue and 1 green

D. LED Boards are mounted to a hinged front to allow opening Internal LED Cabinet to allow servicing internal electronic components without the need to remove the LED boards

E. NIT Rating shall be variable, up to 10,000

F. LED boards to be 16 pixels high by 16 pixels wide

G. The LED display can display the following:

1. Text sizes range from 2.8" – 34”
2. Capable of displaying graphics, video clips and animations
3. Capable of displaying up to 281 quintillion colors
4. Up to 60 frames per second video clips, animations and transitions
5. 1,200 Hertz refresh rate
6. 32 Gigabyte Solid State Hard Drive

H. Brightness controlled either automatically via a light sensor or manually through use of the controlling operating platform.

I. Web-based temperature control via weather.com or customer chosen site.

J. 120V/20A power requirements (see quote for specifics)

K. Exhaust fans run 24/7 to prevent moisture build-up inside the displays.

1.5 SYSTEM REQUIREMENTS

A. Sign to be operated using ANY internet connected device. Not restricted by any machine. Preference is to interface through a modern browser (Firefox, Chrome….)

B. Ability to overlay text on top of graphics or video clips

C. Ability to provide a count-down to a specific event in days, hours, minutes or seconds

D. Ability to preview message before transmitting to display.

1.6 SOFTWARE: WWW.SIGNCOMMAND.COM CLOUD-BASED PROGRAMMING

A. www.SignCommand.com is the interface site.

B. Secured using Amazon Web Service hosting

C. 2 factor authentication

D. Use from anywhere in the world with internet access on any modern browser

E. Intuitive, simple interface

F. NOTHING TO DOWNLOAD

G. Remote diagnostics

H. No monthly fees ever.

1.7 ELECTRICAL SPECIFICATIONS

A. Qty. 2 20A 208VAC circuits

1.8 POWER SUPPLIES

A. Power supply circuitry to be conformal coated

B. Support a Voltage Range of: 88 ~ 264VAC

C. Overload protection: 105 ~ 135% of rated power

D. Input Efficiency: 80%

E. Over Temperature Protection: Auto shut-down of voltage and recovers automatically when temperature goes g down.

1. Working Temperature: -40 degrees up to 176 degrees Fahrenheit

1.9 DATA COMMUNICATION OPTIONS

A. LED display shall be compatible with the following options.

1. LIFETIME Cellular data service via Verizon Wireless 4G LTE (no fees/bills)

1.10 SPECIFIED PRODUCT WARRANTY

A. Lifetime warranty against workmanship and defects

B. Lifetime warranty on the Makrolon SL® sign faces due to breakage by vandalism, except for gunshots

C. 5 Year warranty on the LED display and internal components

D. 5 year warranty on CELLULAR MODEL (1 YEAR ON ALL OTHERS)

E. 5 year on LED lamping

F. Provide written warranty for complete details.

1.11 SOFTWARE TRAINING

A. Provide unlimited telephone training FREE for life.

B. Provide online, self-guided video tutorials at no cost as well for life.

1.12 SUBMITTALS

A. Manufacturer will provide online links to software, programming / user manuals and maintenance procedures.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Valve boxes.
   2. Insulation.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. This Section is a part of each Division 22 Section.

1.3 ADDITIONAL REQUIREMENTS

A. Furnish and install any incidental work not shown or specified which is necessary to provide a complete and workable system.

B. Make all temporary connections required to maintain services during the course of this Contract without additional cost to the Owner. Notify the Owner seven days in advance before disturbing any service.

C. Plumbing work done under this contract shall not adversely affect the operation of the existing plumbing systems.

1.4 REFERENCES AND STANDARDS

A. Where material or equipment is specified to conform to referenced standards, it shall be assumed that the most recent edition of the standard in effect at the time of bid shall be used.

   1. CSA – Canadian Standards Association International.
   2. ANSI - American National Standards Institute.
   3. ASTM - American Society for Testing and Materials.
   4. CCR - California Code of Regulations.

      a. Title 8 - Division of Industrial Safety, Subchapter 7; General Industry Safety Orders, Articles 31 through 36.

   5. NCPWB - National Certified Pipe Welding Bureau.
   6. CEC - California Electrical Code.
   7. NEMA - National Electrical Manufacturers' Association.
   8. NFPA - National Fire Protection Association.
   9. OSHA - Occupational Safety and Health Act.
   10. UL - Underwriters' Laboratories, Inc.

B. Requirements of Regulatory Agencies:

1. The publications listed below form part of this specification; comply with provisions of these publications except as otherwise shown or specified.
   a. California Building Code, 2022.
   b. California Electrical Code, 2022.
   c. California Energy Code, 2022.
   d. California Fire Code, 2022.
   e. California Green Building Standards Code, 2022.
   f. California Mechanical Code, 2022.
   g. California Plumbing Code, 2022.
   h. California Code of Regulations, Title 24.
   i. California Health and Safety Code.
   j. CAL-OSHA.
   k. California State Fire Marshal, Title 19 CCR.
   l. National Fire Protection Association.
   m. Occupational Safety and Health Administration.
   n. Other applicable state laws.

2. Nothing in Drawings or specifications shall be construed to permit work not conforming to these codes, or to requirements of authorities having jurisdiction. It is not the intent of Drawings or specifications to repeat requirements of codes except where necessary for clarity.

1.5 DRAWINGS

A. Examine Contract Documents prior to bidding of work and report discrepancies in writing to Architect.

B. Drawings showing location of equipment and materials are diagrammatic and job conditions will not always permit installation in location shown. The Plumbing Drawings show general arrangement of equipment and materials, etc., and shall be followed as closely as existing conditions, actual building construction, and work of other trades permit.

1. Architectural and Structural Drawings shall be considered part of the Work. These Drawings furnish Contractor with information relating to design and construction of the Project. Architectural Drawings take precedence over Plumbing Drawings.
2. Because of the small scale of Plumbing Drawings, not all offsets, fittings, and accessories required are shown. Investigate structural and finish conditions affecting the Work and arrange Work accordingly. Provide offsets, fittings, and accessories required to meet conditions. Inform Architect immediately when job conditions do not permit installation of equipment and materials in the locations shown. Obtain the Architects approval prior to relocation of equipment and materials.
3. Relocate equipment and materials installed without prior approval of the Architect. Remove and relocate equipment and materials at Contactors' expense upon Architects' direction.

4. Minor changes in locations of equipment, piping, etc., from locations shown shall be made when directed by the Architect at no additional cost to the Owner providing such change is ordered before such items of work, or work directly connected to same are installed and providing no additional material is required.

C. Execute work mentioned in Specifications and not shown on Drawings, or vice versa, the same as if specifically mentioned or shown in both.

1.6 FEES AND PERMITS

A. Obtain and pay for all permits and service required in installation of this work; arrange for required inspections and secure approvals from authorities having jurisdiction. Comply with requirements of Division 01.

B. Arrange for utility connections and pay charges incurred, including excess service charges.

1. Bear the cost of construction related to utility services, from point of connection to utility services shown on Contract Documents. This includes piping, excavation, backfill, meters, boxes, check valves, backflow prevention devices, general service valves, concrete work, and the like, whether or not Work is performed by Contractor, local water/sanitation district, public utility, other governmental agencies or agencies' assigns.

C. Coordination:

1. General:

a. Coordinate plumbing Work with trades covered in other Specifications Sections to provide a complete, operable and sanitary installation of the highest quality workmanship.

2. Electrical Coordination:

a. Refer to the Electrical Drawings and Specifications, Division 26, for service voltage and power feed wiring for equipment specified under this section. Contractor has full responsibility for the following items of work:

1) Review the Electrical Drawings and Division 26 Specifications to verify that electrical services provided are adequate and compatible with equipment requirements.
2) If additional electrical services are required above that indicated on Electrical Drawings and in Division 26, such as more control interlock conductors, larger feeder, or separate 120 volt control power source, include cost to furnish and install additional electrical services as part of the bid.
3) Prior to proceeding with installation of additional electrical work, submit detailed drawings indicating exact scope of additional electrical work.

3. Mechanical Coordination:

    a. Arrange for pipe spaces, chases, slots and openings in building structure during progress of construction, to accommodate mechanical system installation.
    b. Coordinate installation of supporting devices. Set sleeves in poured-in-place concrete and other structural components during progress of construction.
    c. Coordinate requirements for access panels and doors for mechanical items requiring access where concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section “Access Doors and Frames.”
    d. Coordinate with other trades equipment locations, pipe, duct and conduit runs, electrical outlets and fixtures, air inlets and outlets, and structural and architectural features. Provide information on location of piping and seismic bracing to other trades as required for a completely coordinated project.

1.7 SUBMITTALS - GENERAL

A. Refer to Division 01 Submittals Section(s) for additional requirements.

B. Submittal packages may be submitted via email as PDF electronic files, or as printed packages. PDFs shall be legible at actual size (100 percent). Provide seven copies of printed submittal packages.

C. Provide submittal of materials proposed for use as part of this Project. Product names in Specifications and on Drawings are used as standards of quality. Furnish standard items on specified equipment at no extra cost to the Contract regardless of disposition of submittal data. Other materials or methods shall not be used unless approved in writing by Architect. Architect's review will be required even though "or equal" or synonymous terms are used.

1. Partial or incomplete submittals will not be considered.
2. Quantities are Contractor's responsibility and will not be reviewed.
3. Provide materials of the same brand or manufacturer for each class of equipment or material.
4. Identify each item by manufacturer, brand, trade name, number, size, rating, or other data necessary to properly identify and review materials and equipment. Words "as specified" are not sufficient identification.
5. Identify each submittal item by reference to items’ Specification Section number and paragraph, by Drawing and detail number, and by unit tag number.
6. Organize submittals in same sequence as in Specification Sections.
7. Show physical arrangement, construction details, finishes, materials used in fabrications, provisions for piping entrance, access requirements for installation and maintenance, physical size, mechanical characteristics, foundation and support details, and weight.

    a. Submit Shop Drawings, performance curves, and other pertinent data, showing size and capacity of proposed materials.
    b. Specifically indicate, by drawn detail or note, that equipment complies with each specifically stated requirement of Contract Documents.

c. Drawings shall be drawn to scale and dimensioned (except schematic diagrams). Drawings may be prepared by vendor but must be submitted as instruments of Contractor, thoroughly checked and signed by Contractor before submission to Architect for review.
d. Catalog cuts and published material may be included with supplemental scaled drawings.

D. Review of submittals will be only for general conformance with design concept and general compliance with information given in Contract Documents. Review will not include quantities, dimensions, weights or gauges, fabrication processes, construction methods, coordination with work of other trades, or construction safety precautions, which are sole responsibility of Contractor. Review of a component of an assembly does not indicate acceptance of an assembly. Deviations from Contract Documents not clearly identified by Contractor are Contractor's responsibility and will not be reviewed by Architect.

E. Within reasonable time after award of contract and in ample time to avoid delay of construction, submit to Architect Shop Drawings or submittals on all items of equipment and materials provided. Provide submittal in at least seven copies and in complete package.

1. Shop Drawings and submittals shall include Specification Section, Paragraph number, and Drawing unit symbol or detail number for reference. Organize submittals into booklets for each Specification section and submit in loose-leaf binders with index. Deviations from the Contract Documents shall be prominently displayed in the front of the submittal package and referenced to the applicable Contract requirement.

F. Furnish to the Project Inspector complete installation instructions on material and equipment before starting installation.

1.8 ACTION SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for plumbing systems materials and products.

B. Shop Drawings.

C. Pipe, pipe or plumbing fittings, fixtures, solder and flux installed in a system providing water for human consumption shall comply with lead free requirements of the California Health and Safety Code Section 116875. Provide submittal information for products third-party certified by an approved laboratory as complying with California Health and Safety Code Section 116875.

D. Seismic Shop Drawing Submittals: For seismic supports, anchorages, restraints, and vibration isolators indicated to comply with performance requirements and design criteria.

1. Calculations performed for use in selection of seismic supports, anchorages, and restraints shall utilize criteria indicated in Structural Contract Documents.
2. Include design calculations and details for selecting vibration isolators and vibration isolation bases complying with performance requirements, design criteria, and analysis data signed and sealed by the California registered structural engineer responsible for their preparation.
3. Supports, anchorages and restraints for piping, ductwork, and equipment shall be an OSHPD pre-approved system such as TOLCO, ISAT, Mason, or equal. Pipes, ducts and equipment shall be seismically restrained in accordance with requirements of current edition of California Building Code. System shall have current OPM number and shall meet additional requirements of authority having jurisdiction. Provide supporting documentation required by the reviewing authority and the Architect and Engineer. Provide layout drawings showing piping, ductwork and restraint locations.

    a. Bracing of Piping and Equipment: Specifically state how bracing attachment to structure is accomplished. Provide shop drawings indicating seismic restraints, including details of anchorage to building. In-line equipment must be braced independently of piping, and in conformance with applicable building codes. Provide calculations to show that pre-approval numbers have been correctly applied in accordance with general information notes of pre-approval documentation.
    b. In lieu of the above or for non-standard installations not covered in the above pre-approved systems, Contractor shall provide layout drawings showing piping, ductwork, and restraint locations, and detail supports, attachments and restraints, and furnish supporting calculations and legible details sealed by a California registered structural engineer, in accordance with 2022California Building Code
4. Additional Requirements: In addition to the above, conform to all state and local requirements.

1.9 INFORMATIONAL SUBMITTALS

A. Provide layouts for plumbing systems, for inclusion in coordinated layout specified in Section 23 80 00. Comply with requirements for layouts specified in Section 23 80 00.

1.10 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

1. Refer to Division 01 for complete instructions.
2. Furnish three complete sets of Operation and Maintenance Manual bound in hardboard binder, and one compact disc containing complete Operation and Maintenance Manual in searchable PDF format. Provide Table of Contents. Provide index tabs for each piece of equipment in binder and disc. Begin compiling data upon approval of submittals.

    a. Sets shall incorporate the following:

        1) Product Data.

2) Shop Drawings.
3) Record Drawings.
4) Service telephone number, address and contact person for each category of equipment or system.
5) Complete operating and maintenance instructions for each item of plumbing equipment and systems.
6) Copies of guarantees/warrantees for each item of equipment and systems.
7) Test data and system balancing reports.
8) Typewritten maintenance instructions for each item of equipment listing lubricants to be used, frequency of lubrication, inspections required, adjustment, etc.
9) Manufacturers' bulletins with parts numbers, instructions, etc., for each item of equipment.
10) Control diagrams and literature.
11) Check test and start reports for each piece of plumbing equipment provided as part of the Work.
12) Commissioning and Preliminary Operation Tests required as part of the Work.

b. Post service telephone numbers and/or addresses in an appropriate place as designated by the Architect.

B. Record Drawings:

1. Refer to Division 01, Record Documents, for requirements governing Work specified herein.
2. Upon completion of the work, deliver to Architect the following:

a. Originals of drawings showing the Work exactly as installed.
b. One complete set of reproducible drawings showing the Work exactly as installed.
c. One compact disc with complete set of drawings in PDF format showing the Work exactly as installed.
d. Provide Contractor’s signature, verifying accuracy of record drawings.
e. Obtain the signature of the Project Inspector for all record drawings.

1.11 SUBSTITUTIONS

A. Refer to Division 01 for complete instructions. Requirements given below are in addition to or are intended to amplify Division 01 requirements. In the case of conflict between requirements given herein and those of Division 01, Division 01 requirements shall apply.

B. It is the responsibility of Contractor to assume costs incurred because of additional work and or changes required to incorporate proposed substitute into the Project. Refer to Division 01 for complete instructions.

C. Substitutions will be interpreted to be all manufacturers other than those specifically listed in the Contract Documents by brand name, model or catalog number.

D. Only one request for substitution will be considered for each item of equipment or material.

E. Substitution requests shall include the following:

1. Reason for substitution request.
2. Complete submittal information as described herein; see “Submittals.”
3. Coordinated scale layout drawings depicting position of substituted equipment in relation to other work, with required clearances for operation, maintenance and replacement.
4. List optional features required for substituted equipment to meet functional requirements of the system as indicated in Contract Documents.
5. Explanation of impact on connected utilities.
6. Explanation of impact on structural supports.

F. Installation of reviewed substitution is the Contractors’ responsibility. Any mechanical, electrical, structural, or other changes required for installation of reviewed substituted equipment or material must be made by the Contractor without additional cost to the Owner. Review by the Architect of the substituted equipment or material, including dimensioned Drawings will not waive these requirements.

G. Contractor may be required to compensate the Architect for costs related to substituted equipment or material.

1.12 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of plumbing systems products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Contractor's Qualifications: Firm with at least 5 years of successful installation experience on projects with plumbing systems work similar to that required for this Project.

C. California Health and Safety Code Compliance: For products covered under the scope of HSC 116875 for potable water service. Products for potable water service shall be third-party certified by an approved laboratory as complying with California Health and Safety Code Section 116875.

D. Comply with applicable portions of California Plumbing Code pertaining to selection and installation of plumbing materials and products.

E. All materials and products shall be new and shall match existing.

1.13 DELIVERY, STORAGE, AND HANDLING

A. Protect equipment and piping delivered to Project site from weather, humidity and temperature variations, dirt, dust and other contaminants.

1.14 FIELD CONDITIONS

A. Contractor shall visit Project site and examine existing conditions in order to become familiar with Project scope. Verify dimensions shown on Drawings at Project site. Bring discrepancies to the attention of Architect. Failure to examine Project site shall not constitute basis for claims for additional work because of lack of knowledge or location of hidden conditions that affect Project scope.

B. Information on Drawings relative to existing conditions is approximate. Deviations from Drawings necessary during progress of construction to conform to actual conditions shall be approved by the Architect and shall be made without additional cost to the Owner. The Contractor shall be held responsible for damage caused to existing services. Promptly notify the Architect if services are found which are not shown on Drawings.

1.15 WARRANTY

A. Refer to Division 01 for warranty requirements, and duration and effective date of Contractor’s Standard Guarantee.

B. Repair or replace defective work, material, or part that appears within the warranty period, including damage caused by leaks.

C. On failure to comply with the warranty requirements within a reasonable length of time after notification is given, the Architect/Owner shall have the repairs made at the Contractor's expense.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials or equipment of the same type shall be of the same brand wherever possible. All materials shall be new and in first class condition.

B. All sizes, capacities, and efficiency ratings shown are minimum, except that gas capacity is maximum available.

C. Refer to Sections 22 10 00 and 23 80 00 for specific system piping materials.

2.2 MATERIALS AND PRODUCTS

A. No material installed as part of this Work shall contain asbestos.

B. Insulation products, including insulation, insulation facings, jackets, adhesives, sealants and coatings shall not contain polybrominated diphenyl ethers (PBDEs) in penta, octa, or deca formulations in amounts greater than 0.1 percent (by mass).

2.3 VALVE BOXES

A. General:

1. Where several valves or other equipment are grouped together, provide larger boxes of rectangular “vault” type adequately sized for condition and similar in construction to those specified above.
2. Provide valve box extensions as required to set bottom of valve box tight up to top of piping in which valve is installed.
3. Provide a tee handle wrench for each size, Alhambra Foundry Co. #A-3008, or equal.

B. Valve Boxes in Non-Traffic Areas: Provide Christy No. F22, Brooks, or equal, 8 inches inside diameter by 30 inches long, with cast iron or steel locking cover. Provide Owner with set of special wrenches or tools as required for operation of valves. Cut bottom of plastic body for operation of valves.

2.4 PIPE IDENTIFICATION

A. Identify each piping system and indicate the direction of flow by means of Seton, Inc., Marking Services Inc., Reef Industries, Inc., or equal, pre-tensioned, coiled semi-rigid plastic pipe labels formed to circumference of pipe, requiring no fasteners or adhesive for attachment to pipe.

B. The legends and flow arrows shall conform to ASME A13.1.

2.5 INSULATION WORK

A. General:

1. For insulating domestic hot water pumps, refer to Section 225000, Plumbing Equipment,
2. Insulation products, including insulation, insulation facings, jackets, adhesives, sealants and coatings shall not contain polybrominated diphenyl ethers (PBDEs) in penta, octa, or deca formulations in amounts greater than 0.1 percent (by mass).
3. Adhesives and sealants shall comply with testing and product requirements of South Coast Air Quality Management District, Rule 1168.
4. The term "piping" used herein includes pipe, valves, strainers and fittings.
5. Apply insulating cement to fittings, valves and strainers and trowel smooth to the thickness of adjacent covering. Cover with jacket to match piping. Extend covering on valves up to the bonnet. Leave strainer cleanout plugs accessible.
6. Provide pre-formed PVC valve and fitting covers.
7. Provide Calcium Silicate rigid insulation and sheet metal sleeve, 18 inch minimum length at each pipe hanger. Seal ends of insulation to make vapor tight with jacket.
8. Test insulation, jackets and lap-seal adhesives as a composite product and confirm flame spread of not more than 25 and a smoke developed rating of not more than 50 when tested in accordance with UL723 or ASTM E84.
9. Clean thoroughly, test and have approved, all piping and equipment before installing insulation and/or covering.

10. Repair all damage to existing pipe and equipment insulation whether or not caused during the work of this contract, to match existing adjacent insulation for thickness and finish, but conforming to flame spread and smoke ratings specified above.

B. Insulation of Piping:
1. Insulate roof drain and overflow drain bodies, horizontal sections of rainwater leader piping and overflow piping, and condensate drains within the building envelope with 1 inch thick fiberglass, minimum 3-1/2 pound per cubic foot density, with ASJ-SSL jacket.
2.
3. Exposed insulated piping within the building shall have a Zeston 2000 25/50, Proto Lo-Smoke, or equal, PVC jacket and fitting cover installed over the insulation, applied per manufacturer's instructions. Insulation shall be vapor tight before applying PVC jacket and fitting covers. Verify suitability with manufacturer of insulation. Insulation with pre-applied polymer jacket may be substituted at Contractor's option.
4. Where insulated piping is exposed to the weather apply aluminum jacket secured with 1/2 inch stainless-steel bands on 12 inch centers. Insulation shall be vapor tight before applying metal jacket, and aluminum fitting covers. Install jacketing with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Cover fittings with glass cloth, two coats of Foster Sealfas 30-36, and factory-fabricated aluminum fitting covers, of same material, finish, and thickness as jacket. Insulation shall be vapor tight before applying metal jacket and fitting covers.

a. Fitting covers:

1) Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.
2) Tee covers.
3) Flange and union covers.
4) End caps.
5) Beveled collars.
6) Valve covers.
7) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

b. Jacket thickness:

1) Pipes 10 inches diameter and smaller: Minimum .016 inch thick jacket with smooth finish.
2) Pipes 12 inches diameter and larger: Minimum .020 inch thick jacket with smooth finish.

PART 3 - EXECUTION

3.1 EXISTING MATERIALS

A. Remove existing equipment, piping, wiring, construction, etc., which interferes with Work of this Contract. Promptly return to service upon completion of work in the area. Replace items damaged by Contractor with new material to match existing.

B. Removed materials which will not be re-installed and which are not claimed by Owner shall become property of Contractor and shall be removed from Project site. Consult Owner before removing any material from Project site. Carefully remove materials claimed by Owner to prevent damage and deliver to Owner-designated storage location.

C. Existing piping and wiring not reused and are concealed in building construction may be abandoned in place and all ends shall be capped or plugged. Remove unused piping and wiring exposed in Equipment Rooms or occupied spaces. Material shall be removed from Project premises. Disconnect power, water, gas, pump or any other active energy source from piping or electrical service prior to abandoning in place.

D. Existing piping, ductwork, and equipment modified or altered as part of this Work shall comply with the most recent applicable code requirements.

3.2 FRAMING, CUTTING AND PATCHING

A. Special framing, recesses, chases and backing for Work of this Section, unless otherwise specified, are covered under other Specification Sections.

B. Contractor is responsible for placement of pipe sleeves, hangers, inserts, supports, and location of openings for the Work.

C. Cutting, patching, and repairing of existing construction to permit installation of equipment, and materials is the responsibility of Contractor. Repair or replace damage to existing work with skilled mechanics for each trade.

D. Cut existing concrete construction with a concrete saw. Do not utilize pneumatic devices.

E. Core openings through existing construction for passage of new piping and conduits. Cut holes of minimum diameter to suit size of pipe and associated insulation installed. Coordinate with building structure, and obtain Structural Engineer's approval prior to coring through existing construction.

3.3 PLUMBING DEMOLITION

A. Refer to Division 01 Sections “Cutting and Patching” and “Selective Demolition” for general demolition requirements and procedures.

B. Disconnect, dismantle and remove mechanical systems, equipment, and components indicated to be removed. Coordinate with all other trades.

1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.

2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping to remain with same or compatible piping material. Refrigerant system must be evacuated per EPA requirements.
3. Equipment to Be Removed: Drain down and cap remaining services and remove equipment.
4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.4 ELECTRICAL REQUIREMENTS

A. Provide adequate working space around electrical equipment in compliance with the California Electrical Code. Coordinate the Mechanical Work with the Electrical Work to comply.

B. Furnish necessary control diagrams and instructions for the controls. Before permitting operation of any equipment which is furnished, installed, or modified under this Section, review all associated electrical work, including overload protection devices, and assume complete responsibility for the correctness of the electrical connections and protective devices. Motors and control equipment shall conform to the Standards of the National Electrical Manufacturers' Association. All equipment and connections exposed to the weather shall be NEMA IIIR with factory-wired strip heaters in each starter enclosure and temperature control panel where required to inhibit condensation.

C. All line voltage and low voltage wiring and conduit associated with the Temperature Control System are included in this Section. Wiring and conduit shall comply with Division 26.

3.5 PIPING SYSTEM REQUIREMENTS

A. Drawing plans, schematic and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

3.6 PRIMING AND PAINTING

A. Perform priming and painting on the equipment and materials as specified herein.

B. See Division 09 Painting Section(s) for detailed requirements.

C. Priming and Painting:

1. Exposed ferrous metals, including piping, which are not galvanized or factory-finished shall be primed and painted.

    a. Black Steel Piping:

        1) Primer: One coat gray Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, comparable products by Rust-Oleum, Kelly Moore, or equal.
        2) Topcoat: Two coats gray Sherwin-Williams Pro Industrial Waterbased Alkyd Urethane Enamel, comparable products by Rust-Oleum, Kelly Moore, or equal.

2. Metal surfaces of items to be jacketed or insulated except piping shall be given two coats of primer unless furnished with equivalent factory finish. Items to be primed shall be properly cleaned by effective means free of rust, dirt, scale, grease and other deleterious matter and then primed with the best available grade of zinc rich primer. After erection or installation, all primed surfaces shall be properly cleaned of any foreign or deleterious matter that might impair proper bonding of subsequent paint coatings. Any abrasion or other damage to the shop or field prime coat shall be properly repaired and touched up with the same material used for the original priming.
3. Where equipment is provided with nameplate data, the nameplate shall be masked off prior to painting. When painting is completed, remove masking material.

3.7 EXCAVATING

A. Perform all excavating required for work of this Section. Provide the services of a pipe/cable locating service prior to excavating activities to determine location of existing utilities.

B. Unless shown otherwise, provide a minimum of 2'-6" cover above top of pipe to finished grade for all service piping, unless otherwise noted. Trim trench bottom by hand or provide a 4 inch deep minimum bed of sand to provide a uniform grade and firm support throughout entire length of pipe. For all PVC pipe and for PE gas pipe, bed the pipe in 4 inch sand bed. Pipe bedding materials should be clean crushed rock, gravel or sand of which 100 percent will pass a 1 inch sieve. For pipes that are larger than 10 inches in diameter, at least 95 percent should pass a 3/4 inch sieve, and for pipes 10 inches in diameter or smaller, 100 percent should pass a 1/2 inch sieve. All other materials should have a minimum sand equivalent of 50. Only a small proportion of the native soils will meet these requirements without extensive processing; therefore, importation of pipe bedding materials should be anticipated. Pipe bedding materials shall be compacted in lifts not exceeding 6 inches in compacted thickness. Each lift shall be compacted to not less than 90 percent relative compaction at or above the optimum moisture content, in accordance with ASTM Specification D2940, except that bedding materials graded such that 100 percent of the material will pass a No. 200 sieve shall be compacted in 6 inch lifts using a single pass of a flat-plate, vibratory compactor or vibratory drum. Pipe bedding materials should extend at least to the spring line.

C. Maintain all warning signs, barricades, flares, and red lanterns as required.

D. For all trenches 5 feet or more in depth, submit copy of permit detailed drawings showing shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trenches. Obtain a permit from the Division of Industrial Safety prior to beginning excavations. A copy of the permit shall be available at the site at all times.

3.8 BACKFILLING

A. Backfill shall comply with applicable provisions of Division 31 of these Specifications.

B. Except under existing or proposed paved areas, walks, roads, or similar surfaces, backfill for other types of pipe shall be made using suitable excavated material or other approved material. Place backfill in 8 inch layers, measured before compaction, and compact with impact hammer to at least 90 percent relative compaction per ASTM D2940.

1. Backfill plastic pipe and insulated pipe with sand for a minimum distance of 12 inches above the top of the pipe. Compact using mechanical tamping equipment.

C. Entire backfill for excavations under existing or proposed pavements, walks, roads, or similar surfaces, under new slabs on grade, shall be made with clean sand compacted with mechanical tamping equipment vibrator to at least 90 percent relative compaction per ASTM D2940. Remove excess earth. Increase the minimum compaction within the uppermost two feet of backfill to 95 percent.

D. Replace or repair to its original condition all sod, concrete, asphalt paving, or other materials disturbed by the trenching operation. Repair within the guarantee period as required.

3.9 PIPING SYSTEMS INSTALLATION

A. At time of final connection, and prior to opening valve to allow pressurization of water and gas piping from existing systems, on site or off site, perform a pressure test to indicate static pressure of existing systems. If pressure on water piping is greater than 80 psi, or gas pressure is not as indicated on Contract Documents, inform Architect immediately. Do not allow piping systems to be pressurized without written consent of the Architect.

B. General:

1. All piping shall be concealed unless shown or otherwise directed. Allow sufficient space for ceiling panel removal.
2. Installation of piping shall be made with appropriate fittings. Bending of piping will not be accepted.
3. Install piping to permit application of insulation and to allow valve servicing.
4. Where piping or conduit is left exposed within a room, the same shall be run true to plumb, horizontal, or intended planes. Where possible, uniform margins are to

be maintained between parallel lines and/or adjacent wall, floor, or ceiling surfaces.

5. Horizontal runs of pipes and/or electrical conduit suspended from ceilings shall provide for a maximum headroom clearance. The clearance shall not be less than 6'-6" without written approval from the Architect.
6. Close ends of pipe immediately after installation. Leave closure in place until removal is necessary for completion of installation.
7. Each piping system shall be thoroughly flushed and proved clean before connection to equipment.
8. Install exposed polished or enameled connections with special care showing no tool marks or threads at fittings.
9. Install horizontal valves with valve stem above horizontal.
10. Use reducing fittings; bushings shall not be allowed. Use eccentric reducing fittings wherever necessary to provide free drainage of lines and passage of air.
11. Verify final equipment locations for roughing-in.
12. Furnish and install anchors or thrust blocks on PVC water lines in the ground, at all changes in direction of piping, and at all connections or branches from mains 1-1/2 inch and larger. Form anchors or thrust blocks by pouring concrete between pipe and trench wall. Thrust blocks shall be of adequate size and so placed as to take thrusts created by maximum internal water pressure. Sizing and placement shall be per manufacturer's recommendations, CPC, and IAPMO installation standards. Anchor piping to building construction.
13. Sanitary Sewer and Storm Drain: Grade piping inside building uniformly 1/4 inch per foot if possible but not less than 1/8 inch per foot. Run piping as straight as possible. Make piping connections between building piping and outside service pipe with cast iron reducers or increasers. Slope sewers uniformly between given elevations where invert elevations are shown.
14. Where piping is installed in walls within one inch of the face of stud, provide a 16 gauge sheet metal shield plate on the face of the stud. The shield plate shall extend a minimum of 1-1/2 inches beyond the outside diameter of the pipe.

C. Sleeves:

1. Install Adjus-to-Crete, Pipeline Seal and Insulator, or equal, pipe sleeves of sufficient size to allow for free motion of pipe, 24 gauge galvanized steel. The space between pipe and sleeves through floor slabs on ground, through outside walls above or below grade, through roof, and other locations as directed shall be caulked with oakum and mastic and made watertight. The space between pipe and sleeve and between sleeve and slab or wall shall be sealed watertight.
2. At Contractor's option, Link-Seal, Metraflex Metraseal, or equal, casing seals may be used in lieu of caulking. Wrap pipes through slabs on grade with 1 inch thick fiberglass insulation to completely isolate the pipe from the concrete.

D. Floor, Wall, and Ceiling Plates:

1. Fit all pipes with or without insulation passing through walls, floors, or ceilings, and all hanger rods penetrating finished ceilings with chrome-plated or stainless escutcheon plates.

E. Firestopping:

1. Pack the annular space between the pipe sleeves and the pipe through all floors and walls with UL listed fire stop, and sealed at the ends. All pipe penetrations shall be UL listed, Hilti, 3M Pro-Set, or equal.

    a. Install fire caulking behind mechanical services installed within fire rated walls, to maintain continuous rating of wall construction.

2. Provide SpecSeal Systems UL fire rated sleeve/coupling penetrators for each pipe penetration or fixture opening passing through floors, walls, partitions or floor/ceiling assemblies. All Penetrators shall comply with UL Fire Resistance Directory (Latest Edition), and in accordance with Chapter 7, CBC requirements.
3. Sleeve penetrators shall have a built in anchor ring for waterproofing and anchoring into concrete pours or use the special fit cored hole penetrator for cored holes.
4. Copper and steel piping shall have SpecSeal plugs on both sides of the penetrator to reduce noise and to provide waterproofing.
5. All above Systems to be installed in strict accordance with manufacturer's instructions.
6. Alternate firestopping systems are acceptable if approved equal. However, any deviation from the above specification requires the Contractor to be responsible for determining the suitability of the proposed products and their intended use, and the Contractor shall assume all risks and liabilities whatsoever in connection therewith.

F. Hangers and Supports:

1. General: Support equipment and piping so that it is firmly held in place by approved iron hangers and supports and special hangers. Hanger and support components shall support weight of equipment and pipe, fluid, and pipe insulation based on spacing between supports with minimum factor of safety of five based on ultimate strength of material used. Do not exceed manufacturer's load rating. Pipe attachments or hangers, of same size as pipe or tubing on which used, or nearest available. Rigidly fasten hose faucets, fixture stops, compressed air outlets, and similar items to the building construction. The Architect shall approve hanger material before installation. Do not support piping with plumbers' tape, wire rope, wood, or other makeshift devices. Where building structural members do not match piping support spacing, provide “bridging” support members firmly attached to building structural members in a fashion approved by the structural engineer.

    a. Materials, design, and type numbers per Manufacturers' Standardization Society (MSS), Standard Practice (SP)-58.

        1) Provide copper-plated or felt-lined hangers for use on copper tubing.

2. Hanger components shall be provided by one manufacturer: B-Line, Grinnell, Unistrut, Badger, or equal.
3. Riser clamps: B-line model B3373, or equal.
4. Pipe Hanger and Support Placement and Spacing:

a. Vertical piping support spacing: Provide riser clamps for piping, above each floor, in contact with the floor. Provide support at joints, branches, and horizontal offsets. Provide additional support for vertical piping, spaced at or within the following maximum limits:

Pipe Diameter	Steel Threaded or Welded (Note 3)	Steel Gas	Copper Brazed or Soldered (Note 3)	CPVC & PVC (Note 2)
1/2 - 1”	12 ft.	6 ft.	Each Floor, Not to Exceed 10 ft.	Base and Each Floor (Note 1)
1-1/4 - 2”	12 ft.	Each Floor, Not to Exceed 10 ft.	Each Floor, Not to Exceed 10 ft..	Base and Each Floor (Note 1)
2-1/2 - 3”	12 ft.	Each Floor, Not to Exceed 10 ft.	Each Floor, Not to Exceed 10 ft.	Base and Each Floor (Note 1)
Over 4”	12 ft.	Each Floor, Not to Exceed 10 ft.	Each Floor, Not to Exceed 10 ft.	Base and Each Floor (Note 1)

1) Note 1: Provide mid-story guides.
2) Note 2: For PVC piping, provide for expansion every 30 feet per IAPMO installation standard. For CPVC piping, provide for expansion per IAPMO installation standard.
3) Note 3: Spacing of hangers and supports for piping assembled with mechanical joints shall be in accordance with standards acceptable to authorities having jurisdiction.

b. Vertical cast iron piping support spacing: Base and each floor not to exceed 15 feet.

c. Horizontal piping, hanger and support spacing: Locate hangers and supports at each change of direction, within one foot of elbow, and spaced at or within following maximum limits:

Pipe Diameter	Steel Threaded or Welded (Note 2)	Steel Gas	Copper Brazed or Soldered (Notes 2, 3)	CPVC & PVC (Note 1)
1/2 - 1"	6 ft.	6 ft.	5 ft.	3 ft.
1-1/4 - 2"	7 ft.	10 ft.	6 ft.	4 ft.

2-1/2 - 3"	10 ft.	10 ft.	10 ft.	4 ft.
Over 4"	10 ft.	10 ft.	10 ft.	4 ft.

1) Note 1: For PVC piping, provide for expansion every 30 feet per IAPMO installation standard. For CPVC piping, provide for expansion per IAPMO installation standard.
2) Note 2: Spacing of hangers and supports for piping assembled with mechanical joints shall be in accordance with standards acceptable to authorities having jurisdiction.
3) Note 3: Includes all refrigerant piping, including vapor and hot gas pipes.

d. Horizontal cast iron piping support spacing:

1) Support piping at every other joint for piping length of less than 4 feet.
2) For piping longer than 4 feet, provide support on each side of the coupling, within 18 inches of each joint.
3) Hanger shall not be installed on the coupling.
4) Provide support at each horizontal branch connection.
5) Provide sway brace at 40 foot maximum spacing for suspended pipe with no-hub joints, except where a lesser spacing is required by the seismic design criteria used in design for seismic systems. Refer to Article, Submittals.
6) Provide a brace on each side of a change in direction of 90 degrees or more.

5. Suspended Piping:

a. Individually suspended piping: B-Line B3690 J-Hanger or B3100 Clevis, complete with threaded rod, or equal. All hangers on supply and return piping handling heating hot water or steam shall have a swing connector at point of support.

Pipe Size	Rod Size Diameter
2" and Smaller	3/8"
2-1/2" to 3-1/2"	1/2"
4" to 5"	5/8"
6"	3/4"

b. Trapeze Suspension: B-Line 1-5/8 inch width channel in accordance with manufacturer's published load ratings. No deflection to exceed 1/180 of a span.

c. Trapeze Supporting Rods: Shall have a safety factor of five; securely anchor to building structure.
d. Pipe Clamps and Straps: B-Line B2000, B2400; isolate copper pipe with two thicknesses of 2 inches wide 10-mil polyvinyl tape. Where used for seismic support systems, provide B-Line B2400 series pipe straps.
e. Concrete Inserts: B-line B22-I continuous insert or B2500 spot insert. Do not use actuated fasteners for support of overhead piping unless approved by Architect.

6. Support to Structure:

7. Rubber Neoprene Pipe Isolators:

a. Pipe isolators shall comprise an internal rubber or neoprene material that isolates pipe from hanger and structure. Install at all piping located in acoustical walls. Refer to Architectural Drawings for location of acoustical walls.
b. Isolation material shall be either a rubber or neoprene material that prevents contact between the pipe and the structure. The rubber shall have between a 45 to 55 durometer rating and a minimum thickness of 1/2 inch.
c. Acceptable Suppliers:

1) Vertical runs: Acousto-Plumb or equal.
2) Horizontal runs: B-Line, Vibraclamp; Acousto-Plumb or equal.

8. Provide rigid insulation and a 12 inch long, 18 gauge galvanized sheet iron shield between the covering and the hanger whenever hangers are installed on the outside of the pipe covering.
9. Insulate copper tubing from ferrous materials and hangers with two thicknesses of 3 inch wide, 10 mil polyvinyl tape wrapped around pipe.
10. Provide a support or hanger close to each change of direction of pipe either horizontal or vertical and as near as possible to concentrated loads.
11. Suspend rods from concrete inserts with removable nuts where suspended from concrete decks. Power actuated inserts will not be allowed.

3.10 UNION AND FLANGE INSTALLATION

A. Install Watts, Epco, Nibco, or equal, dielectric unions or flanges at points of connection between copper or brass piping or material and steel or cast iron pipe or material except in drain, waste, vent, or rainwater piping. Bushings or couplings shall not be used. Dielectric unions installed in potable water systems shall conform to the lead-free requirements of the California Health and Safety Code Section 116875.

B. Install unions in piping NPS 2” and smaller, and flanges in piping NPS 2-1/2” and larger whether shown or not at each connection to all equipment and tanks, and at all connections to all automatic valves, such as temperature control valves. Unions installed in potable water systems shall conform to the lead-free requirements of the California Health and Safety Code Section 116875.

C. Locate the unions for easy removal of the equipment, tank, or valve.

3.11 CONCRETE WORK

A. Concrete work required for work of this Section shall be included under another section of the Specification, unless otherwise noted, including poured-in-place concrete work for installing precast manholes, catch basins, etc., and shall include reinforced concrete bases for pumps, tanks, compressors, fan units, boilers, unless the work is specifically indicated on the Drawings to be furnished under this Section.

B. Thrust blocks, underground anchors, and pads for cleanouts, valve access boxes and washer boxes are included under this Section of the Specification. Concrete shall be 3000 psi test minimum. Refer to Division 03 for concrete types.

3.12 PIPE PROTECTION

A. Sleeve copper piping/tubing installed below slab with “Polywrap-C” polyethylene sleeve, as manufactured by Northtown Pipe Protection Products, or equal. Sleeve shall be a minimum of 6 mils thick, colored blue for domestic water piping and orange for other piping. Install sleeve per manufacturer’s recommendations and instructions.

B. Sleeve copper piping/tubing installed outside building below grade with “Polywrap-C” polyethylene sleeve, as manufactured by Northtown Pipe Protection Products, or equal. Sleeve shall be a minimum of 6 mils thick, colored blue for domestic water piping. Install sleeve per manufacturer’s recommendations and instructions.

C. Covering: No rocks or sharp edges shall be backfilled against the wrap or sleeve. When backfilling with other than sand, protect wrap with an outer wrapping of Kraft paper; leave in place during backfill.

3.13 PIPE IDENTIFICATION

A. Provide temporary identification of each pipe installed, at the time of installation. Temporary identification shall be removed and replaced with permanent identification as part of the work.

B. Apply the legend and flow arrow at all valve locations; at all points where the piping enters or leaves a wall, partition, cluster of piping or similar obstruction, at each change of direction and at approximately 20'-0" intervals on pipe runs. Variations or changes in locations and spacing may be made with the approval of the Architect. There shall be at least one marking in each room. Markings shall be located for maximum visibility from expected personnel approach.

C. Wherever two or more pipes run parallel, the markings shall be supplied in the same relative location on each.

D. Apply markings after painting and cleaning of piping and insulation is completed.

3.14 PIPING SYSTEM PRESSURE TESTING

A. General:

1. Perform operational tests under simulated or actual service conditions, including one test of complete plumbing installation with fixtures and other appliances connected.
2. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.

B. Piping Systems: Test piping systems in accordance with the following requirements and applicable codes:

1. Authority having jurisdiction shall witness tests of piping systems.
2. Notify Architect at least seven days in advance of testing.
3. All piping shall be tested at completion of roughing-in, or at other times as directed by Architect.
4. Furnish necessary materials, test pumps, gases, instruments and labor required for testing.
5. Isolate from system equipment that may be damaged by test pressure.

C. Test Schedule: No loss in pressure or visible leaks shall show after four hours at the pressures indicated.

D. Testing of Sanitary Sewer, Drain, Vent, and Storm Drain may be done in segments in order to limit pressure to within manufacturer's recommendations. Test to 10 feet above highest point in the system.

System Tested	Test Pressure PSI	Test With
Sanitary Sewer, Drain, Vent	10 Ft. Hd.	Water
Storm Drain, Condensate Drains	10 Ft. Hd.	Water

1. Non-corrosive leak test fluid shall be suitable for use with piping material specified, and with the type of gas conveyed by the piping system.

3.15 OPERATION OF SYSTEMS

A. Do not operate any plumbing equipment for any purpose, temporary or permanent, until all of the following has been completed:

1. Complete all requirements listed under "Check, Test and Start Requirements."
2. Piping has been properly cleaned. Piping systems shall be flushed and treated prior to operation.
3. Filters, strainers etc. are in place.
4. Bearings have been lubricated, and alignment of rotating equipment has been checked.
5. Equipment has been run under observation, and is operating in a satisfactory manner.

B. Provide test and balance agency with one set of Contract Drawings, Specifications, Addenda, Change orders issued, applicable shop drawings and submittals and temperature control drawings.

3.16 CHECK, TEST AND START REQUIREMENTS

A. An authorized representative of the equipment manufacturer shall perform check, test and start of each piece of plumbing equipment. The representative may be an employee of the equipment manufacturer, or a manufacturer-certified contractor. Submit written certification from the manufacturer stating that the representative is qualified to perform the check test and start of the equipment.

1. As part of the submittal process, provide a copy of each manufacturer's printed startup form to be used.
2. Some items of specified equipment may require that check, test and start of equipment must be performed by the manufacturer, using manufacturer's employees. See specific equipment Articles in these Specifications for this requirement.
3. Provide all personnel, test instruments, and equipment to properly perform the check, test and start work.
4. When work has been completed, provide copies of reports for review, prior to final observation of work.

B. Provide copies of the completed check, test and start report of each item of equipment, bound with the Operation and Maintenance Manual.

C. Upon completion of the work, provide a schedule of planned maintenance for each piece of equipment. Indicate frequency of service, recommended spare parts (including filters and lubricants), and methods for adjustment and alignment of all equipment components. Provide a copy of the schedule with each operating and maintenance manual. Provide a copy of certification from the Owner's representative indicating that they have been properly instructed in maintenance requirements for the equipment installed.

3.17 PRELIMINARY OPERATIONAL REQUIREMENTS AND TESTS

A. Prior to observation to determine final acceptance, put all mechanical systems into service and check that work required for that purpose has been done, including but not limited to the following condensed check list. Provide indexed report to tabulating the results of all work.

1. All equipment has been started, checked, lubricated and adjusted in accordance with the manufacturer's recommendations.
2. Correct rotation of motors and ratings of overload heaters are verified.
3. Specified filters are installed and spare filters have been turned over to Owner.
4. All manufacturers' certificates of start-up specified have been delivered to the Owner.
5. All equipment has been cleaned, and damaged painted finishes touched up.
6. Missing or damaged parts have been replaced.

7. Flushing and chemical treatment of piping systems has been completed and water treatment equipment, where specified, is in operation.
8. Equipment labels, pipe marker labels, ceiling markers and valve tags are installed.
9. Valve tag schedules, corrected control diagrams, sequence of operation lists and start-stop instructions have been posted.
10. Preliminary test and balance work is complete, and reports have been forwarded for review.
11. Automatic control set points are as designated and performance of controls checks out to agree with the sequence of operation.
12. Operation and Maintenance Manuals have been delivered and instructions to the operating personnel have been made.

B. Prior to the observation to determine final acceptance, operate all mechanical systems as required to demonstrate that the installation and performance of these systems conform to the requirements of these specifications.

1. Operate and test all mechanical equipment and systems for a period of at least five consecutive 8 hour days to demonstrate the satisfactory overall operation of the project as a complete unit.
2. Commence tests after preliminary balancing and adjustments to equipment have been checked. Immediately before starting tests, install air filters and lubricate all running equipment. Notify the Architect at least seven calendar days in advance of starting the above tests.
3. During the test period, make final adjustments and balancing of equipment, systems controls, and circuits so that all are placed in first class operating condition.
4. Where Utility District rebates are applicable, demonstrate that the systems meet the rebate program requirements.

C. Review of Contractor's Tests:

1. All tests made by the Contractor or manufacturers' representatives are subject to observation and review by the Owner. Provide timely notice prior to start of each test, in order to allow for observation of testing. Upon the completion of all tests, provide a letter to confirm that all testing has been successful.

D. Test Logs:

1. Maintain test logs listing the tests on all mechanical systems showing dates, items tested, inspectors' names, remarks on success or failure of the tests.

E. Preliminary Operation:

1. The Owner reserves the right to operate portions of the plumbing system on a preliminary basis without voiding the guarantee.

3.18 CERTIFICATES OF INSTALLATION

A. Contractor shall complete applicable “Certificates of Installation” forms contained in the California Building Energy Efficiency Standards and submit to the authorities having jurisdiction for approval and issuance of final occupancy permit, as described in the California Energy Code.

3.19 DEMONSTRATION AND TRAINING

A. An authorized representative of the equipment manufacturer shall train Owner-designated personnel in maintenance and adjustment of equipment. The representative may be an employee of the equipment manufacturer, or a manufacturer-certified contractor. Submit written certification from the manufacturer stating that the representative is qualified to perform the Owner training for the equipment installed.

1. As part of the submittal process, provide a training agenda outlining major topics and time allowed for each topic.
2. Some items of specified equipment require that training must be performed by the manufacturer, using manufacturer’s employees. See specific equipment Articles in these Specifications for this requirement.
3. Contractor shall provide three copies of certification by Contractor that training has been completed, signed by Owner’s representative, for inclusion in Operation and Maintenance Manual. Certificates shall include:

    a. Listing of Owner-designated personnel completing training, by name and title.
    b. Name and title of training instructor.
    c. Date(s) of training.
    d. List of topics covered in training sessions.

4. Refer to specific equipment Articles for minimum training period duration for each piece of equipment.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipe and fittings.
2. Drain and waste piping specialties.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 22 00 50 Basic Plumbing Materials and Methods.

1.3 ACTION SUBMITTALS

A. For additional requirements, refer to Section 22 00 50, Basic Plumbing Materials and Methods.

B. Product Data: Submit manufacturer's technical product data and installation instructions for plumbing piping systems materials and products.

1.4 INFORMATIONAL SUBMITTALS

A. For additional requirements, refer to Section 22 00 50, Basic Plumbing Materials and Methods.

B. Gas Pipe Installer Qualifications: Provide evidence of current qualifications for individuals performing work requiring qualifications.

1.5 CLOSEOUT SUBMITTALS

A. For additional requirements, refer to Section 22 00 50, Basic Plumbing Materials and Methods.

B. Maintenance Data: Submit maintenance data and parts lists for plumbing piping systems materials and products. Include this data in Operation and Maintenance Manual.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish to Owner, with receipt, one valve key for each key operated hydrant, bibb, or faucet installed.

1.7 QUALITY ASSURANCE

A. For additional requirements, refer to Section 22 00 50, Basic Plumbing Materials and Methods.

PART 2 - PRODUCTS

2.1 MATERIALS AND PRODUCTS

A. Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Provide materials and products complying with California Plumbing Code. Where more than one type of material or product is indicated, selection from materials or products specified is Contractor's option.

B. Potable-water piping and components shall comply with NSF 14, NSF 61, and NSF 372. Plastic piping components shall be marked with "NSF-pw."

2.2 PIPE AND FITTINGS ATTACHED TO AND BELOW BUILDINGS INCLUDING 5 FEET FROM BUILDINGS

A. Piping and fittings attached to covered walkways and corridors shall comply with the requirements of this article.

B. Condensate Drain Piping:

1. Inside buildings provide ASTM B88, Type L copper tubing and fittings. Provide Wye fittings with capped cleanout plug for tubing up to 1 inch size. Provide wrought or cast DWV fittings for sizes 1-1/4 inch and larger.
2. Outside buildings provide ASTM B88, Type L copper pipe and fittings, cast iron drain pipe and fittings or Schedule 40 galvanized steel pipe and cast iron drain or vent fittings.
3. Connect condensate drains to mechanical equipment per equipment manufacturer's recommendations; provide P-trap where required. Slope piping to drain, with 1 inch in 10 foot minimum pitch. Provide di-electric couplings or unions at connections to dissimilar materials.
4. Where condensate drain P-traps are required, install trap using Wye fitting on inlet and outlet of trap. Provide cap on top of each Wye, made removable for cleaning and inspection. Drill 1/8 inch diameter hole in cap at outlet of the trap to allow venting of the system. Minimum depth of trap should be 4 inches, or as recommended by the manufacturer in printed literature.
5. Provide cleanout tees or “Y” at each change in direction.

2.3 PIPE JOINING MATERIALS

A. Refer to piping Articles in this Section for special joining materials not listed below.

B. Solder Filler Metals: ASTM B 32, 100 percent lead free alloys. Include water-flushable flux according to ASTM B813.

C. Brazing Filler Metals: AWS A5.8, BCup-5 Series, copper-phosphorus unless otherwise indicated. Sil-Fos 15, or equal.

2.4 DRAIN AND WASTE PIPING SPECIALTIES

A. Cleanouts:

1. General: Install cleanouts of same diameter as pipe (4 inch maximum) in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18 inches from building construction so as to provide sufficient space for rodding. No horizontal run over 50 feet inside buildings or 100 feet outside buildings shall be without cleanout, whether shown on Drawings or not. Provide two-way cleanouts where indicated on drawings, and where required for satisfactory use.

    a. Provide cleanouts in waste drop from each sink and urinal.
    b. Provide one wrench for each size and type of cleanout used. Turn over to Owner at completion of the project, and obtain receipt. Place receipt in Operation and Maintenance Manuals.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which plumbing piping systems are to be installed. Do not proceed with Work until unsatisfactory conditions have been corrected in manner acceptable to Contractor.

B. Make all arrangements for the utilities required. Pay all costs involved in obtaining the services including gas service and meter, water meter, pressure reducing valve, access boxes, street work. Connect to site utilities. Verify the location of all services. No extra cost will be allowed if services are not as shown.

C. At time of final connection, and prior to opening valve to allow pressurization of water and gas piping from existing systems, on site or off site, perform a pressure test to indicate static pressure of existing systems. If pressure on water piping is greater than 80 psi, or gas pressure is not as indicated on Contract Documents, inform Architect immediately. Do not allow piping systems to be pressurized without written consent of the Architect.

3.2 PIPE JOINTS AND CONNECTIONS

A. General:

1. Cutting: Cut pipe and tubing square, remove rough edges or burrs. Bevel plain ends of steel pipe.
2. Remove scale, slag, dirt and debris from inside and outside of pipe before assembly.

3. Boss or saddle type fittings or mechanically extracted tube joints will not be allowed.

B. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.

C. Copper Pipe and Tubing (Except pneumatic control piping): All joints shall be brazed according to ASME Section IX, Welding and Brazing Qualifications, except domestic water piping 1-1/4 inches and smaller when not buried in the ground or concrete and type DWV plumbing piping may be soldered.

1. Soldered joints: Apply water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828.

3.3 INSTALLATION OF CLEANOUTS

A. Cleanouts: Install in piping as indicated, as required by California Plumbing Code, at each change in direction of piping greater than 45 degrees. Install at maximum intervals of 50 feet for piping 4 inches and smaller and 100 feet for larger piping inside buildings, and at base of each conductor.

B. Flashing Flanges: Install flashing flange and clamping device with each cleanout passing through water resistant membrane.

3.4 INSTALLATION OF GAS PRESSURE REGULATING VALVES

A. Install as indicated; comply with utility requirements. In locations where regulators are installed in confined spaces, pipe atmospheric vent to outdoors, full size of outlet. Install gas shutoff valve upstream and downstream of each pressure-regulating valve.

3.5 EQUIPMENT CONNECTIONS

A. Piping Runouts to Fixtures: Provide hot and cold water piping runouts to fixtures of sizes indicated.

B. Mechanical Equipment Connections: Connect hot and cold water piping system and gas piping system to mechanical equipment as indicated, and provide with shutoff valve and union for each connection.

3.6 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures, and trim that are installed as part of this work. Remove labels from stainless steel sinks, except 316 stainless steel sink labels should be retained to confirm that the correct material has been provided. Leave systems and equipment in satisfactory operating condition.

3.7 OPERATIONAL TESTS

A. Test each piece of equipment to show that it will operate in accordance with indicated requirements.

3.8 TESTING AND BALANCING

A. See Section 23 05 93 of Specifications for testing and balancing requirements.

3.9 CLEANING UP

A. Upon completion of Work remove materials, equipment, apparatus, tools, and the like, and leave premises clean, neat, and orderly.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Electric motors.
2. Motor starters.
3. Strainers.
4. Gauges.
5. Thermometers.
6. Flexible joints.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. This Section is a part of each Division 23 Section.

1.3 ADDITIONAL REQUIREMENTS

A. Furnish and install incidental work not shown or specified necessary to provide a complete and workable system.

B. Make all temporary connections required to maintain services, including adequate heat and cooling, during the course of the Contract without additional cost to Owner. Notify Owner seven days in advance before disrupting services.

C. Provide for adjustments or modifications to fan and motor sheaves, belts, damper linkages, and other components as required to achieve specified air balance at no additional cost to Owner.

1.4 REFERENCES AND STANDARDS

A. Where material or equipment is specified to conform to referenced standards, it shall be assumed that the most recent edition of the standard in effect at the time of bid shall be used.

1. AABC - Associated Air Balance Council
2. AFBMA - Anti Friction Bearing Manufacturer's Association
3. AMCA - Air Moving and Control Association Inc.

    a. Standard 210 - Laboratory Methods of Testing Fans

4. ANSI - American National Standards Institute
5. ARI - Air-Conditioning and Refrigeration Institute
6. ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers

7. ASME - American Society of Mechanical Engineers
8. ASTM - American Society for Testing and Materials
9. CCR - California Code of Regulations

    a. Title 8 - Division of Industrial Safety, Subchapter 7; General Industry Safety Orders, Articles 31 through 36

10. CSA – Canadian Standards Association International
11. CSFM - California State Fire Marshal
12. NCPWB - National Certified Pipe Welding Bureau
13. NIST - National Institute of Standards and Technology
14. NEMA - National Electrical Manufacturers' Association
15. NFPA - National Fire Protection Association
16. OSHA - Occupational Safety and Health Act
17. SMACNA - Duct Manuals
18. UL - Underwriters' Laboratories, Inc.

B. Requirements of Regulatory Agencies:

1. The publications listed below form part of this specification; comply with provisions of these publications except as otherwise shown or specified.
    a. California Building Code, 2022.
    b. California Electrical Code, 2022.
    c. California Energy Code, 2022.
    d. California Fire Code, 2022.
    e. California Green Building Standards Code, 2022.
    f. California Mechanical Code, 2022.
    g. California Plumbing Code, 2022.
    h. California Code of Regulations, Title 24.
    i. California Health and Safety Code.
    j. CAL-OSHA.
    k. California State Fire Marshal, Title 19 CCR.
    l. National Fire Protection Association.
    m. Occupational Safety and Health Administration.
    n. Other applicable state laws.

2. Nothing in Drawings or specifications shall be construed to permit work not conforming to these codes, or to requirements of authorities having jurisdiction. It is not the intent of Drawings or specifications to repeat requirements of codes except where necessary for clarity.

1.5 DRAWINGS

A. Examine Drawings prior to bidding of work and report discrepancies in writing to Architect.

B. Drawings showing location of equipment and materials are diagrammatic and job conditions will not always permit installation in location shown. The HVAC Drawings show general arrangement of equipment and materials, etc., and shall be followed as

closely as existing conditions, actual building construction, and work of other trades permit.

1. Architectural and Structural Drawings shall be considered part of the Work. These Drawings furnish Contractor with information relating to design and construction of the Project. Architectural Drawings take precedence over HVAC Drawings.
2. Because of the small scale of HVAC Drawings, not all offsets, fittings, and accessories required are shown. Investigate structural and finish conditions affecting the Work and arrange Work accordingly. Provide offsets, fittings, and accessories required to meet conditions. Inform Architect immediately when job conditions do not permit installation of equipment and materials in the locations shown. Obtain the Architects approval prior to relocation of equipment and materials.
3. Relocate equipment and materials installed without prior approval of the Architect. Remove and relocate equipment and materials at Contactors' expense upon Architects' direction.
4. Minor changes in locations of equipment, piping, ducts, etc., from locations shown shall be made when directed by the Architect at no additional cost to the Owner providing such change is ordered before such items of work, or work directly connected to same are installed and providing no additional material is required.

C. Execute work mentioned in the Specifications and not shown on the Drawings, or vice versa, the same as if specifically mentioned or shown in both.

1.6 FEES AND PERMITS

A. Obtain and pay for permits and service required in installation of the Work. Arrange for required inspections and secure approvals from authorities having jurisdiction. Comply with requirements of Division 01.

B. Arrange for utility connections and pay charges incurred, including excess service charges.

C. Coordination:

1. General:

    a. Coordinate HVAC Work with trades covered in other Specifications Sections to provide a complete, operable and sanitary installation of the highest quality workmanship.
2. Electrical Coordination:

    a. Refer to the Electrical Drawings and Specifications, Division 26, for service voltage and power feed wiring for equipment specified under this section. Contractor has full responsibility for the following items of work:

        1) Review the Electrical Drawings and Division 26 Specifications to verify that electrical services provided are adequate and compatible with equipment requirements.

2) If additional electrical services are required above that indicated on Electrical Drawings and in Division 26, such as more control interlock conductors, larger feeder, or separate 120 volt control power source, include cost to furnish and install additional electrical services as part of the bid.
3) Prior to proceeding with installation of additional electrical work, submit detailed drawings indicating exact scope of additional electrical work.

3. Mechanical Coordination:

a. Arrange for pipe spaces, chases, slots and openings in building structure during progress of construction, to accommodate mechanical system installation.
b. Coordinate installation of supporting devices. Set sleeves in poured-in-place concrete and other structural components during construction.
c. Coordinate requirements for access panels and doors for mechanical items requiring access where concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section “Access Doors and Frames.”
d. Coordinate with other trades equipment locations, pipe, duct and conduit runs, electrical outlets and fixtures, air inlets and outlets, and structural and architectural features. Provide information on location of piping and seismic bracing to other trades as required for a completely coordinated project.

1.7 SUBMITTALS - GENERAL

A. Refer to Division 01 Submittals Section(s) for additional requirements.

B. Submittal packages may be submitted via email as PDF electronic files, or as printed packages. PDFs shall be legible at actual size (100 percent). Provide seven copies of printed submittal packages.

C. Provide submittal of materials proposed for use as part of this Project. Product names in Specifications and on Drawings are used as standards of quality. Furnish standard items on specified equipment at no extra cost to the Contract regardless of disposition of submittal data. Other materials or methods shall not be used unless approved in writing by Architect. Architect's review will be required even though "or equal" or synonymous terms are used.

1. Partial or incomplete submittals will not be considered.
2. Quantities are Contractor's responsibility and will not be reviewed.
3. Provide materials of the same brand or manufacturer for each class of equipment or material.
4. Identify each item by manufacturer, brand, trade name, number, size, rating, or other data necessary to properly identify and review materials and equipment. Words "as specified" are not sufficient identification.
5. Identify each submittal item by reference to items’ Specification Section number and paragraph, by Drawing and detail number, and by unit tag number.
6. Organize submittals in same sequence as in Specification Sections.
7. Show physical arrangement, construction details, finishes, materials used in fabrications, provisions for piping entrance, access requirements for installation

and maintenance, physical size, mechanical characteristics, foundation and support details, and weight.

a. Submit Shop Drawings, performance curves, and other pertinent data, showing size and capacity of proposed materials.
b. Specifically indicate, by drawn detail or note, that equipment complies with each specifically stated requirement of Contract Documents.
c. Drawings shall be drawn to scale and dimensioned (except schematic diagrams). Drawings may be prepared by vendor but must be submitted as instruments of Contractor, thoroughly checked and signed by Contractor before submission to Architect for review.
d. Catalog cuts and published material may be included with supplemental scaled drawings.

D. Review of submittals will be only for general conformance with design concept and general compliance with information given in Contract Documents. Review will not include quantities, dimensions, weights or gauges, fabrication processes, construction methods, coordination with work of other trades, or construction safety precautions, which are sole responsibility of Contractor. Review of a component of an assembly does not indicate acceptance of an assembly. Deviations from Contract Documents not clearly identified by Contractor are Contractor's responsibility and will not be reviewed by Architect.

E. Within reasonable time after award of contract and in ample time to avoid delay of construction, submit to Architect shop drawings or submittals on all items of equipment and materials provided. Provide submittal as a complete package.

1. Shop drawings and submittals shall include Specification Section, Paragraph number, and Drawing unit symbol or detail number for reference. Organize submittals into booklets for each Specification section and submit in loose-leaf binders with index. Deviations from the Contract Documents shall be prominently displayed in the front of the submittal package and referenced to the applicable Contract requirement.

F. Furnish to the Project Inspector complete installation instructions on material and equipment before starting installation.

1.8 ACTION SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for plumbing systems materials and products.

B. Shop Drawings.

C. Sustainable Design Submittals:

1. Product Data: For adhesives and sealants, documentation of compliance including printed statement of VOC content and chemical components.

2. Laboratory Test Reports: For adhesives and sealants, indicating compliance with requirements for low-emitting materials.

D. Seismic Shop Drawing Submittals: For seismic supports, anchorages, restraints, and vibration isolators indicated to comply with performance requirements and design criteria.

1. Calculations performed for use in selection of seismic supports, anchorages, restraints, and vibration isolators shall utilize criteria indicated in Structural Contract Documents.
2. Include design calculations and details for selecting vibration isolators and vibration isolation bases complying with performance requirements, design criteria, and analysis data signed and sealed by the California registered structural engineer responsible for their preparation.
3. Supports, anchorage and restraints for piping, ductwork, and equipment shall be an OSHPD pre-approved system such as TOLCO, ISAT, Mason, or equal. Pipes, ducts and equipment shall be seismically restrained in accordance with requirements of current edition of California Building Code. System shall have current OPM number and shall meet additional requirements of authority having jurisdiction. Provide supporting documentation required by the reviewing authority and the Architect and Engineer. Provide layout drawings showing piping, ductwork and restraint locations.

    a. Bracing of Piping, Ductwork, and Equipment: Specifically state how bracing attachment to structure is accomplished. Provide shop drawings indicating seismic restraints, including details of anchorage to building. In-line equipment must be braced independently of piping and ductwork, and in conformance with applicable building codes. Provide calculations to show that pre-approval numbers have been correctly applied in accordance with general information notes of pre-approval documentation.
    b. In lieu of the above or for non-standard installations not covered in the above pre-approved systems, Contractor shall provide layout drawings showing piping, ductwork, and restraint locations, and detail supports, attachments and restraints, and furnish supporting calculations and legible details sealed by a California registered structural engineer, in accordance with 2022 California Building Code
4. Additional Requirements: In addition to the above, conform to all state and local requirements.

1.9 INFORMATIONAL SUBMITTALS

A. Provide coordinated layouts for HVAC Ductwork systems, in accordance with Specification Section 23 80 00.

B. Provide evidence of equipment certification to California Energy Code Section 110.1 or 110.2, if not providing Electrically Commutated motors for HVAC fans sized below 1 hp and above 1/12 hp. Refer to specific equipment articles requiring electrically commutated motors.

C. Check, Test, and Start forms, from equipment manufacturers.

D. Check, Test and Start reports.

1.10 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

1. Furnish three complete sets of Operation and Maintenance Manual bound in hardboard binder, and one compact disc containing complete Operation and Maintenance Manual in searchable PDF format. Provide Table of Contents. Provide index tabs for each piece of equipment in binder and disc. Begin compiling data upon approval of submittals.

    a. Sets shall incorporate the following:

        1) Product Data.
        2) Shop Drawings.
        3) Record Drawings.

        4) Service telephone number, address and contact person for each category of equipment or system.
        5) Complete operating instructions for each item of heating, ventilating and air conditioning equipment.
        6) Copies of guarantees/warrantees for each item of equipment or systems.
        7) Test data and system balancing reports.
        8) Typewritten maintenance instructions for each item of equipment listing lubricants to be used, frequency of lubrication, inspections required, adjustment, etc.
        9) Manufacturers' bulletins with parts numbers, instructions, etc., for each item of equipment.
        10) Temperature control diagrams and literature.
        11) Check test and start reports for each piece of mechanical equipment provided as part of the Work.
        12) Commissioning and Preliminary Operation Tests required as part of the Work.

2. Post service telephone numbers and addresses in an appropriate place designated by Architect.

B. Record Drawings:

1. Refer to Division 01 for additional requirements.
2. Upon completion of the Work, deliver to Architect the following:

    a. Originals of drawings showing the Work exactly as installed.
    b. One complete set of reproducible drawings showing the Work exactly as installed.
    c. One compact disc with complete set of drawings in PDF format showing the Work exactly as installed.

d. Provide Contractor's signature, verifying accuracy of record drawings.
e. Obtain the signature of the Inspector of Record for Record Drawings.

1.11 SUBSTITUTIONS

A. Refer to Division 01 for complete instructions. Requirements given below are in addition to or are intended to amplify Division 01 requirements. In case of conflict between requirements given herein and those of Division 01, Division 01 requirements shall apply.

B. It is the responsibility of Contractor to assume costs incurred because of additional work and or changes required to incorporate proposed substitute into the Project. Refer to Division 01 for complete instructions.

C. Substitutions will be interpreted to be manufacturers other than those specifically listed in the Contract Documents by brand name, model, or catalog number.

D. Only one request for substitution will be considered for each item of equipment or material.

E. Substitution requests shall include the following:

1. Reason for substitution request.
2. Complete submittal information as described herein; see "Submittals."
3. Coordinated scale layout drawings depicting position of substituted equipment in relation to other work, with required clearances for operation, maintenance and replacement.
4. List optional features required for substituted equipment to meet functional requirements of the system as indicated in Contract Documents.
5. Explanation of impact on connected utilities.
6. Explanation of impact on structural supports.

F. Installation of reviewed substitution is Contractors' responsibility. Any mechanical, electrical, structural, or other changes required for installation of substituted equipment or material must be made by Contractor without additional cost to Owner. Review by Architect of substituted equipment or material, will not waive these requirements.

G. Contractor may be required to compensate Architect for costs related to substituted equipment or material.

1.12 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of HVAC systems products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Contractor's Qualifications: Firm with at least 5 years of successful installation experience on projects with HVAC systems work similar to that required for this Project.

C. Comply with applicable portions of California Mechanical Code pertaining to selection and installation of HVAC materials and products.

D. All materials and products shall be new.

1.13 DELIVERY, STORAGE, AND HANDLING

A. Protect equipment and materials delivered to Project site from weather, humidity and temperature variations, dirt, dust and other contaminants.

1.14 FIELD CONDITIONS

A. Contractor shall visit Project site and examine existing conditions in order to become familiar with Project scope. Verify dimensions shown on Drawings at Project site. Bring discrepancies to the attention of Architect. Failure to examine Project site shall not constitute basis for claims for additional work because of lack of knowledge or location of hidden conditions that affect Project scope.

B. Information on Drawings relative to existing conditions is approximate. Deviations from Drawings necessary during progress of construction to conform to actual conditions shall be approved by the Architect and shall be made without additional cost to the Owner. The Contractor shall be held responsible for damage caused to existing services. Promptly notify the Architect if services are found which are not shown on Drawings.

1.15 WARRANTY

A. Refer to Division 01 for warranty requirements, and duration and effective date of Contractor’s Standard Guarantee.

B. Repair or replace defective work, material, or part that appears within the warranty period, including damage caused by leaks.

C. On failure to comply with warranty requirements within a reasonable length of time after notification is given, Architect/Owner shall have repairs made at Contractor's expense.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials or equipment of the same type shall be of the same brand wherever possible. All materials shall be new and in first class condition.

B. All sizes, capacities, and efficiency ratings shown are minimum, except that gas capacity is maximum available.

C. Refer to Division 22 10 00 and 23 80 00 for specific system piping materials.

2.2 MATERIALS

A. No material installed as part of this Work shall contain asbestos.

B. California Green Building Code Compliance:

1. HVAC and refrigeration equipment shall not contain CFCs.
2. HVAC and refrigeration equipment shall not contain Halons.

2.3 ELECTRIC MOTORS

A. General Motor Requirements: Comply with NEMA MG 1 unless otherwise indicated. Comply with IEEE 841 for severe-duty motors.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

    a. U.S. Motors.
    b. Century Electric.
    c. General Electric.
    d. Lincoln.
    e. Gould.

B. Motor Characteristics: Designed for continuous duty at ambient temperature of 40 deg. C and at altitude of 3300 feet above sea level. Capacity and torque shall be sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

1. Motors exceeding the nameplate amperage shall be promptly replaced at no cost to the Owner. Horsepower shown is minimum and shall be increased as necessary to comply with above requirements. Furnish motors with splash-proof or weatherproof housings, where required or recommended by the manufacturer. Match the nameplate voltage rating with the electrical service supplied. Check Electrical Drawings. Provide a transformer for each motor not wound specifically for system voltage.

C. Polyphase Motors: NEMA MG 1, Design B, medium induction motor, premium efficiency as defined in NEMA MG 1. Select motors with service factor of 1.15. Provide motor with random-wound, squirrel cage rotor, and permanently lubricated or regreasable, shielded, antifriction ball bearings suitable for radial and thrust loading. Temperature rise shall match insulation rating. Provide Class F insulation.

1. Multispeed motors shall have separate windings for each speed.

D. Polyphase Motors with Additional Requirements:

1. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
2. Motors Used with Variable Frequency Controllers:

    a. Separately Connected Motors: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.

b. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width modulated inverters.
c. Premium-Efficient Motors: Class B temperature rise; Class F insulation.
d. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
e. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.
f. Each motor shall be provided with a shaft grounding device for stray current protection.

3. Severe-Duty Motors: Comply with IEEE 841, with 1.15 minimum service factor.

E. Single-Phase Motors:

1. Select motors with service factor of 1.15.

2. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:

a. Permanent-split capacitor.
b. Split phase.
c. Capacitor start, inductor run.
d. Capacitor start, capacitor run.

3. Motors for HVAC exhaust, transfer, and supply fans larger than 1/12 hp and smaller than 1 hp shall be the following:

a. Electronically Commutated motor (EC type): Motor shall be electronically commutated type specifically designed for applications, with heavy duty ball bearings. The motor shall be speed controllable down to 20% of full speed and 85% efficient at all speeds.

1) Exceptions:

a) Motors in fan-coils and terminal units that operate only when providing heating to the space served.
b) Motors installed in space conditioning equipment certified under California Energy Code Section 110.1 or 110.2.

4. Contractor's Option: Motors scheduled on Drawings as single-phase, and larger than 1/12 hp and smaller than 1 hp, for applications other than HVAC fans, may be EC type.
5. Multispeed Motors: Variable-torque, permanent-split-capacitor type.
6. Bearings: Prelubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
7. Motors 1/20 HP and Smaller: Shaded-pole type.
8. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.

2.4 MOTOR STARTERS

A. Square D, Allen Bradley, or equal, in NEMA Type 1 enclosure, unless otherwise specified or required. Minimum starter size shall be Size 1. Provide NEMA 3R enclosure where exposed to outdoors.

B. Provide magnetic motor starters for all equipment provided under the Mechanical Work. Starters shall be non-combination type. Provide part winding or reduced voltage start motors where shown or as hereinafter specified. Minimum size starter shall be Size 1.

1. All starters shall have the following:

    a. Cover mounted hand-off-automatic switch. Starters installed exposed in occupied spaces shall have key operated HOA switch.
    b. Ambient compensated thermal overload.
    c. Fused control transformer (for 120 or 24 volt service).
    d. Pilot lights, integral with the starters. Starters located outdoors shall be in NEMA IIIR enclosures.

2. Where three phase motors are provided for two-speed operation, provide two speed motor starters.
3. Starters for single-phase motors shall have thermal overloads. NEMA I enclosure for starters located indoors, NEMA IIIR enclosure for starters located outdoors.
4. Provide OSHA label indicating the device starts automatically.

2.5 STRAINERS

A. Charles M. Bailey #100A, Armstrong, Muessco, or equal, Fig. 11 "Y" pattern, 125 psi WP minimum, with monel screens with 20 square mesh for 2 inches and smaller and 3/64 inch perforations for 2-1/2 inches and larger. Install all strainers with a blow-off hose valve with hose adapter. Strainer shall have gasketed cover with straight thread.

2.6 GAUGES

A. Marsh "Series J", U.S. Gage, Danton 800, or equal, with bronze bushed movement and front recalibration. Dials shall be white with black numerals, 3-1/2 inch dial face. Normal reading shall be at mid-scale. Provide a needle valve on each gauge connection. Supply a gauge piped with branch isolation valves across the inlet and outlet of each pump and where shown on the Drawings.

B. Provide Pete's Plug II, Sisco P/T, or equal, test plug with Nordel core {and gasketed cap}, on inlet and outlet of each coil, boiler, condenser, chiller and heat exchanger and where shown on Drawings.

2.7 THERMOMETERS

A. Marsh, Taylor, Palmer, or equal, 5 inch diameter bimetal dial, adjustable from face, with adjustable positioner, located to be easily read from normal personnel approach. Normal reading shall be at mid-scale.

1. Provide extension for insulation.
2. Provide thermometers with steel bulb chambers and brass separable sockets.
3. Thermometers for air temperature shall have 8 inch minimum stem.

B. Provide Ventlock, Durodyne, or equal thermometer test holes at each air conditioning unit, furnace, and make-up air unit, in mixed air and supply air, and at all locations shown or scheduled on the Drawings. Provide two portable thermometers, with sensing connection arranged to suit test connections.

C. Provide Pete's Plug II, Sisco P/T, or equal, test plug with Nordel core, on inlet and outlet of each coil, boiler, condenser, chiller and heat exchanger and provide two digital electronic test thermometers for each range of fluid temperature and where shown on Drawings.

2.8 FLEXIBLE JOINTS

A. Where indicated on Drawings, provide Metraflex Metrasphere, Style R, Mason Industries, or equal, Spherical Expansion Joints. Provide control units at each expansion joint, arranged to limit both expansion and compression.

2.9 PIPE GUIDES

A. Where flexible connections are indicated on Drawings, provide Metraflex style IV, B-Line, or equal, pipe guides in locations recommended by manufacturer. Maximum spacing from flexible connection to first pipe guide is 4 pipe diameters, and maximum spacing from second pipe guide is 14 pipe diameters.

2.10 EQUIPMENT IDENTIFICATION

A. Identify each piece of equipment with a permanently attached engraved bakelite plate, 1/2 inch high white letters on black background.

2.11 PIPE IDENTIFICATION

A. Identify each piping system and indicate the direction of flow by means of Seton, Inc., Marking Services Inc., Reef Industries, Inc., or equal, pre-tensioned, coiled semi-rigid plastic pipe labels formed to circumference of pipe, requiring no fasteners or adhesive for attachment to pipe.

B. The legend and flow arrow shall conform to ASME A13.1.

PART 3 - EXECUTION

3.1 EXISTING MATERIALS

A. Remove existing equipment, piping, wiring, construction, etc., which interferes with Work of this Contract. Promptly return to service upon completion of work in the area. Replace items damaged by Contractor with new material to match existing.

B. Removed materials which will not be re-installed and which are not claimed by Owner shall become the property of Contractor and shall be removed from the Project site. Consult Owner before removing any material from the Project site. Carefully remove materials claimed by Owner to prevent damage and deliver to Owner-designated storage location.

C. Existing piping and wiring not reused and are concealed in building construction may be abandoned in place and all ends shall be capped or plugged. Remove unused piping and wiring exposed in Equipment Rooms or occupied spaces. Material shall be removed from the premises. Disconnect power, water, gas, pump or any other active energy source from piping or electrical service prior to abandoning in place.

3.2 FRAMING, CUTTING, AND PATCHING

A. Special framing, recesses, chases and backing for Work of this Section, unless otherwise specified, are covered under other Specification Sections.

B. Contractor is responsible for placement of pipe sleeves, hangers, inserts, supports, and location of openings for the Work.

C. Cutting, patching, and repairing of existing construction to permit installation of equipment, and materials is the responsibility of Contractor. Repair or replace damage to existing work with skilled mechanics for each trade.

D. Cut existing concrete construction with a concrete saw. Do not utilize pneumatic devices.

E. Core openings through existing construction for passage of new piping and conduits. Cut holes of minimum diameter to suit size of pipe and associated insulation installed. Coordinate with building structure, and obtain Structural Engineer's approval prior to coring through existing construction.

3.3 MECHANICAL DEMOLITION

A. Refer to Division 01 Sections “Cutting and Patching” and “Selective Demolition” for general demolition requirements and procedures.

B. Disconnect, dismantle and remove mechanical systems, equipment, and components indicated to be removed. Coordinate with all other trades.

1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping to remain with same or compatible piping material. Refrigerant system must be evacuated per EPA requirements.
3. Ducts to Be Removed: Remove portion of ducts indicated to be removed and cap remaining ducts with same or compatible ductwork material.
4. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

5. Equipment to Be Removed: Drain down and cap remaining services and remove equipment.
6. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
7. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.4 ELECTRICAL REQUIREMENTS

A. Provide adequate working space around electrical equipment in compliance with the California Electrical Code. Coordinate the Mechanical Work with the Electrical Work to comply.

B. Furnish necessary control diagrams and instructions for the controls. Before permitting operation of any equipment which is furnished, installed, or modified under this Section, review all associated electrical work, including overload protection devices, and assume complete responsibility for the correctness of the electrical connections and protective devices. Motors and control equipment shall conform to the Standards of the National Electrical Manufacturers' Association. All equipment and connections exposed to the weather shall be NEMA IIIR with factory-wired strip heaters in each starter enclosure and temperature control panel where required to inhibit condensation.

C. All line voltage and low voltage wiring and conduit associated with the Temperature Control System are included in this Section. Wiring and conduit shall comply with Division 26.

3.5 PIPING SYSTEM REQUIREMENTS

A. Drawing plans, schematic and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

3.6 PRIMING AND PAINTING

A. Perform priming and painting on the equipment and materials as specified herein.

B. See Division 09 Painting Section(s) for detailed requirements.

C. Priming and painting:

1. Exposed ferrous metals, including piping, which are not galvanized or factory-finished shall be primed and painted.

    a. Black Steel Piping:

1) Primer: One coat gray Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, comparable products by Rust-Oleum, Kelly Moore, or equal.
2) Topcoat: Two coats gray Sherwin-Williams Pro Industrial Waterbased Alkyd Urethane Enamel, comparable products by Rust-Oleum, Kelly Moore, or equal.

b. Interior Ductwork: Refer to Division 09 Painting Section(s). Architect shall select paint color.

2. Metal surfaces of items to be jacketed or insulated except ductwork and piping shall be given two coats of primer unless furnished with equivalent factory finish. Items to be primed shall be properly cleaned by effective means free of rust, dirt, scale, grease and other deleterious matter and then primed with the best available grade of zinc rich primer. After erection or installation, all primed surfaces shall be properly cleaned of any foreign or deleterious matter that might impair proper bonding of subsequent paint coatings. Any abrasion or other damage to the shop or field prime coat shall be properly repaired and touched up with the same material used for the original priming.
3. Where equipment is provided with nameplate data, the nameplate shall be masked off prior to painting. When painting is completed, remove masking material.

3.7 EXCAVATING

A. Perform all excavating required for work of this Section. Provide the services of a pipe/cable locating service prior to excavating activities to determine location of existing utilities.

B. Unless shown otherwise, provide a minimum of 2'-6" cover above top of pipe to finished grade for all service piping, unless otherwise noted. Trim trench bottom by hand or provide a 4 inch deep minimum bed of sand to provide a uniform grade and firm support throughout entire length of pipe. For all PVC pipe and for PE gas pipe, bed the pipe in 4 inch sand bed. Pipe bedding materials should be clean crushed rock, gravel or sand of which 100 percent will pass a 1 inch sieve. For pipes that are larger than 10 inches in diameter, at least 95 percent should pass a 3/4 inch sieve, and for pipes 10 inches in diameter or smaller, 100 percent should pass a 1/2 inch sieve. All other materials should have a minimum sand equivalent of 50. Only a small proportion of the native soils will meet these requirements without extensive processing; therefore, importation of pipe bedding materials should be anticipated. Pipe bedding materials shall be compacted in lifts not exceeding 6 inches in compacted thickness. Each lift shall be compacted to not less than 90 percent relative compaction at or above the optimum moisture content, in accordance with ASTM Specification D2940, except that bedding materials graded such 100 percent of the material will pass a No. 200 sieve shall be compacted in 6 inch lifts using a single pass of a flat-plate, vibratory compactor or vibratory drum. Pipe bedding materials should extend at least to the spring line.

C. Maintain all warning signs, barricades, flares, and red lanterns as required.

D. For all trenches 5 feet or more in depth, submit copy of permit detailed drawings showing shoring, bracing, sloping, or other provisions to be made for worker protection from the

hazard of caving ground during the excavation of such trenches. Obtain a permit from the Division of Industrial Safety prior to beginning excavations. A copy of the permit shall be available at the site at all times.

3.8 BACKFILLING

A. Backfill shall comply with applicable provisions of Division 31 of these Specifications.

B. Except under existing or proposed paved areas, walks, roads, or similar surfaces, backfill for other types of pipe shall be made using suitable excavated material or other approved material. Place backfill in 8 inch layers, measured before compaction, and compact with impact hammer to at least 90 percent relative compaction per ASTM D2940.

1. Backfill plastic pipe and insulated pipe with sand for a minimum distance of 12 inches above the top of the pipe. Compact using mechanical tamping equipment.

C. Entire backfill for excavations under existing or proposed pavements, walks, roads, or similar surfaces, under new slabs on grade, shall be made with clean sand compacted with mechanical tamping equipment vibrator to at least 90 percent relative compaction per ASTM D2940. Remove excess earth. Increase the minimum compaction within the uppermost two feet of backfill to 95 percent.

D. Replace or repair to its original condition all sod, concrete, asphalt paving, or other materials disturbed by the trenching operation. Repair within the guarantee period as required.

3.9 UNION AND FLANGE INSTALLATION

A. Install Epco, Nibco, or equal, dielectric unions or flanges at points of connection between copper or brass piping or material and steel or cast iron pipe or material except in drain piping. Bushings or couplings shall not be used.

B. Install unions in piping NPS 2” and smaller 3 or flanges in piping NPS 2-1/2” and larger whether shown or not at each connection to all equipment and tanks, and at all connections to all automatic valves, such as temperature control valves.

C. Locate the unions for easy removal of the equipment, tank, or valve.

D. Do not install unions or flanges in refrigerant piping systems.

3.10 CONCRETE WORK

A. Concrete work required for work of this Section shall be included under another section of the Specification, unless otherwise noted, including poured-in-place concrete work for installing precast manholes, catch basins, etc., and shall include reinforced concrete bases for pumps, tanks, compressors, fan units, boilers, unless the work is specifically indicated on the Drawings to be furnished under this Section.

B. Underground anchors, and pads for valve access boxes are included under this Section of the Specification. Concrete shall be 3000 psi test minimum. Refer to Division 03 for concrete types.

3.11 PIPE PROTECTION

A. Wrap bare galvanized and black steel pipe buried in the ground and to 6" above grade, including piping in conduit, with one of the following, or equal:

1. Polyethylene Coating: Pressure sensitive polyethylene coating, "X-Tru-Coat" as manufactured by Pipe Line Service Corporation or "Green Line" wrap as manufactured by Roystron Products, or equal.

    a. Field Joints and Fittings: Protecto Wrap #1170 tape as manufactured by Pipe Line Service Corporation, or Primer #200 tape by Roystron Products, or equal. Installation shall be as per manufacturer's recommendation and instructions.

2. Tape Wrap: Pressure-sensitive polyvinyl chloride tape, "Transtex #V-l0 or V-20", "Scotchwrap 50", Slipknot l00, PASCO Specialty & Mfg., Inc., or equal, with continuous identification. Tape shall be a minimum of 20 mils thick for fittings and irregular surfaces, two wraps, 50 percent overlap, 40 mils total thickness. Tape shall be laminated with a suitable adhesive; widths as recommended by the manufacturer for the pipe size. Wrap straight lengths of piping with an approved wrapping machine.

B. Field Joints: Valves and Fittings: double wrap polyvinyl chloride tape as above. Provide at least two thicknesses of tape over the joint and extend a minimum of 4 inches over adjacent pipe covering. Build up with primer to match adjacent covering thickness. Width of tape of fittings shall not exceed 3 inches. Tape shall adhere tightly to all surfaces of the fittings without air pockets.

C. Testing: Test completed wrap of piping, including all epoxy painted piping with Tinker and Rasor Co. holiday detector, or equal.

D. Cleaning: Clean all piping thoroughly before wrapping.

1. Inspection: Damaged or defective wraps shall be repaired as directed. No wrapped pipe shall be covered until approved by Architect.

E. Covering: No rocks or sharp edges shall be backfilled against the wrap. When backfilling with other than sand, protect wrap with an outer wrapping of Kraft paper; leave in place during backfill.

3.12 PIPE IDENTIFICATION

A. Provide temporary identification of each pipe installed, at the time of installation. Temporary identification shall be removed and replaced with permanent identification as part of the work.

B. Apply the legend and flow arrow at all valve locations; at all points where the piping enters or leaves a wall, partition, cluster of piping or similar obstruction, at each change of direction, and at approximately 20'-0" intervals on pipe runs. Variations or changes in locations and spacing may be made with the approval of the Architect. There shall be at least one marking in each room. Markings shall be located for maximum visibility from expected personnel approach.

C. Wherever two or more pipes run parallel, the markings shall be supplied in the same relative location on each.

D. Apply the markings after painting and cleaning of piping and insulation is completed.

3.13 EXPANSION ANCHORS IN HARDENED CONCRETE

A. Qualification Tests: The specific anchor shall have a current ICC-ES report and evaluated in cracked concrete in accordance with Acceptance Criteria AC193. If the specific anchor satisfies cyclic testing requirements per Acceptance Criteria AC01, Section 5.6, the full allowable shear and tension loads listed in the current ICC-ES report and manufacturer's recommendations for the specific anchor may be used. Otherwise, the design shear and tension loads shall not be more than 80% of the listed allowable shear and tension loads for the specific anchor.

B. Installation: The anchors must be installed in accordance with the requirements given in ICC Research Committee Recommendations for the specific anchor.

C. Testing: Fifty percent of the anchors shall be load-tested on each job to twice the allowable capacity in tension, except that if the design load is less than 75 pounds; only one anchor in ten need be tested. If any anchor fails, all anchors must be tested. The load test shall be performed in the presence of a special inspector.

D. The load may be applied by any method that will effectively measure the tension in the anchor, such as direct pull with a hydraulic jack, a torque wrench calibrated using the specific anchor or calibrated spring-loading devices. Anchors in which the torque is used to expand the anchor without applying tension to the bolt may not be verified with a torque wrench.

3.14 PIPING SYSTEM PRESSURE TESTING

A. General:

1. Perform operational tests under simulated or actual service conditions.
2. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.

B. Piping Systems: Test the installations in accordance with the following requirements and applicable codes:

1. Notify the Architect at least seven days in advance of testing.
2. Authority having jurisdiction shall witness tests of piping systems.

3. Piping shall be tested at completion of roughing-in, or at other times as directed by the Architect.
4. Furnish necessary materials, test pumps, gases, instruments and labor required for testing.
5. Isolate from system equipment that may be damaged by test pressure.
6. Testing, Evacuating, Charging and Lubrication of Refrigeration Systems:
7. Pressurize with dry nitrogen and/or refrigerant to 300 psig and test all joints with an electronic detector or halide torch. Release the pressure and attach a high vacuum pump. Evacuate to 4 mm (4000 microns) and hold for 30 minutes. Break to 5 psig with dry nitrogen and allow to remain in the system for ten minutes. Evacuate to 2 mm (2000 microns) and hold for 30 minutes. Use a mercury manometer or electronic vacuum gauge. Do not start timing until recommended vacuum range is reached.
8. At the end of the evacuation, if the system has been proved leak-free, charge with refrigerant and fill the crankcase to the oil level specified by the manufacturer. All refrigerant oil shall be delivered to the location in sealed containers.
9. Replenish for a period of one year without cost to the Owner all refrigerant and oil required to maintain the proper levels.

3.15 OPERATION OF SYSTEMS

A. Do not operate any mechanical equipment for any purpose, temporary or permanent, until all of the following has been completed:

1. Complete all requirements listed under “Check, Test and Start Requirements.”
2. Ductwork and piping has been properly cleaned. Piping systems shall be flushed and treated prior to operation.
3. Filters, strainers etc. are in place.
4. Bearings have been lubricated, and alignment of rotating equipment has been checked.
5. Equipment has been run under observation, and is operating in a satisfactory manner.

B. Provide test and balance agency with one set of Contract Drawings, Specifications, Addenda, Change orders issued, applicable shop drawings and submittals and temperature control drawings.

3.16 TEMPORARY HEAT

A. The General Contractor will provide for all temporary heat at such times as may be required or directed by the Architect and pay all fuel and energy costs incurred.

B. Temporary heating facilities proposed for use by the Contractor will be subject to review of the Architect. Prior to use of any equipment for temporary heat, install temporary filters on all return air inlets, to preclude dust and construction debris from entering the duct system. In addition, install filters in air handling units, and replace at the completion of temporary operation.

C. Filters used for temporary operation of systems shall be as specified for permanent filters specified herein.

D. Comply with Check, Test and Start Requirements for start-up of equipment prior to operation for temporary heat.

E. Contractor shall complete the permanent heating system as soon as possible, thereby making it available for temporary heat. When available, the system may be used as required at the direction of the Architect after systems are properly prepared for use as specified elsewhere. Contractor shall then be responsible for operating the system during periods required and the General Contractor shall pay the fuel and energy costs incurred. Operation of the heating system prior to the filing of "notice of completion" shall not change the Guarantee provisions in any way.

3.17 CHECK, TEST AND START REQUIREMENTS

A. An authorized representative of the equipment manufacturer shall perform check, test and start of each piece of mechanical equipment. The representative may be an employee of the equipment manufacturer, or a manufacturer-certified contractor. Submit written certification from the manufacturer stating that the representative is qualified to perform the check test and start of the equipment.

1. As part of the submittal process, provide a copy of each manufacturer’s printed startup form to be used.
2. Some items of specified equipment may require that check, test and start of equipment must be performed by the manufacturer, using manufacturer’s employees. See specific equipment Articles in these Specifications for this requirement.
3. Provide all personnel, test instruments, and equipment to properly perform the check, test and start work.
4. When work has been completed, provide copies of reports for review, prior to final observation of work.

B. Provide copies of the completed check, test and start report of each item of equipment, bound with the Operation and Maintenance Manual.

C. Upon completion of the work, provide a schedule of planned maintenance for each piece of equipment. Indicate frequency of service, recommended spare parts (including filters and lubricants), and methods for adjustment and alignment of all equipment components. Provide a copy of the schedule with each Operation and Maintenance Manual. Provide a copy of certification from the Owner’s representative indicating that they have been properly instructed in maintenance requirements for the equipment installed.

3.18 PRELIMINARY OPERATIONAL REQUIREMENTS AND TESTS

A. Prior to observation to determine final acceptance, put HVAC, plumbing, and fire protection systems into service and check that work required for that purpose has been done, including but not limited to the following condensed check list. Provide indexed report to tabulating the results of all work.

1. All equipment has been started, checked, lubricated and adjusted in accordance with the manufacturer's recommendations, including modulating power exhausts if present.
2. Correct rotation of motors and ratings of overload heaters are verified.
3. Specified filters are installed and spare filters have been turned over to Owner.
4. All manufacturers' certificates of start-up specified have been delivered to the Owner.
5. All equipment has been cleaned, and damaged painted finishes touched up.
6. Damaged fins on heat exchangers have been combed out.
7. Missing or damaged parts have been replaced.
8. Flushing and chemical treatment of piping systems has been completed and water treatment equipment, where specified, is in operation.
9. Equipment labels, pipe marker labels, ceiling markers and valve tags are installed.
10. Valve tag schedules, corrected control diagrams, sequence of operation lists and start-stop instructions have been posted.
11. Preliminary test and balance work is complete, and reports have been forwarded for review.
12. Automatic control set points are as designated and performance of controls checks out to agree with the sequence of operation.
13. Operation and Maintenance Manuals have been delivered and instructions to the operating personnel have been made.

B. Prior to the observation to determine final acceptance, operate all mechanical systems as required to demonstrate that the installation and performance of these systems conform to the requirements of these specifications.

1. Operate and test all mechanical equipment and systems for a period of at least five consecutive 8 hour days to demonstrate the satisfactory overall operation of the project as a complete unit.
2. Include operation of heating and air conditioning equipment and systems for a period of not less than two 8 hour days at not less than 90 percent of full specified heating and cooling capacities in tests.
3. Commence tests after preliminary balancing and adjustments to equipment have been checked. Immediately before starting tests, install air filters and lubricate all running equipment. Notify the Architect at least seven calendar days in advance of starting the above tests.
4. During the test period, make final adjustments and balancing of equipment, systems controls, and circuits so that all are placed in first class operating condition.
5. Where Utility District rebates are applicable, demonstrate that the systems meet the rebate program requirements.

C. Before handing over the system to Owner replace all filters with complete new set of filters.

D. Review of Contractor's Tests:

1. All tests made by the Contractor or manufacturers' representatives are subject to observation and review by the Owner. Provide timely notice prior to start of each

test, in order to allow for observation of testing. Upon the completion of all tests, provide a letter to confirm that all testing has been successful.

E. Test Logs:

1. Maintain test logs listing the tests on all mechanical systems showing dates, items tested, inspectors' names, remarks on success or failure of the tests.

F. Preliminary Operation:

1. The Owner reserves the right to operate portions of the mechanical system on a preliminary basis without voiding the guarantee.

G. Operational Tests:

1. Before operational tests are performed, demonstrate that all systems and components are complete and fully charged with operating fluid and lubricants.
2. Systems shall be operable and capable of maintaining continuous uninterrupted operation during the operating and demonstration period. After all systems have been completely installed, connections made, and tests completed, operate the systems continuously for a period of five working days during the hours of a normal working day.
3. This period of continuous systems operation may be coordinated with the removal of Volatile Organic Compounds (VOCs) from the building prior to occupancy should the Owner decide to implement such a program.
4. Control systems shall be completely operable with settings properly calibrated and adjusted.
5. Rotating equipment shall be in dynamic balance and alignment.
6. If the system fails to operate continuously during the test period, the deficiencies shall be corrected and the entire test repeated.

H. Pre-Occupancy Building Purge:

1. Prior to occupancy, ventilate the building on 100 percent outside air, 100 percent exhaust for a continuous period determined by a qualified industrial hygienist (engaged by the Contractor) to reduce V.O.C’s prior to occupancy.
2. Submit report by the industrial hygienist verifying satisfactory completion of the pre-occupancy purge.

3.19 CERTIFICATES OF INSTALLATION

A. Contractor shall complete applicable “Certificates of Installation” forms contained in the California Building Energy Efficiency Standards and submit to the authorities having jurisdiction for approval and issuance of final occupancy permit, as described in the California Energy Code.

3.20 ACCEPTANCE REQUIREMENTS

A. Contractor shall complete the applicable Acceptance Requirements for Code Compliance contained in the California Building Energy Efficiency Standards. Refer to

T-24 compliance forms on Drawings for systems having Acceptance testing requirements. Contractor shall perform Acceptance tests and complete the appropriate "Certificates of Acceptance." Submit certificates to the authorities having jurisdiction for approval and issuance of final occupancy permit. Contractor shall engage certified HERS Rater to verify duct leakage rate for duct systems indicated on T-24 compliance forms on Drawings as requiring duct leakage rate testing. For additional duct leak testing requirements, refer to Section 238000, "Heating, Ventilating, and Air Conditioning," Article, "Ductwork Sealing and Leak Testing."

1. Covered Processes: In addition to systems listed on T-24 compliance forms on Drawings, complete Acceptance Requirements for the following systems, if applicable to Project:

    a. Parking garage ventilation systems.
    b. Compressed air systems.
    c. Type 1 Kitchen exhaust systems.

3.21 DEMONSTRATION AND TRAINING

A. An authorized representative of the equipment manufacturer shall train Owner-designated personnel in maintenance and adjustment of equipment. The representative may be an employee of the equipment manufacturer, or a manufacturer-certified contractor. Submit written certification from the manufacturer stating that the representative is qualified to perform the Owner training for the equipment installed.

1. As part of the submittal process, provide a training agenda outlining major topics and time allowed for each topic.
2. Some items of specified equipment require that training must be performed by the manufacturer, using manufacturer's employees. See specific equipment Articles in these Specifications for this requirement.
3. Contractor shall provide three copies of certification by Contractor that training has been completed, signed by Owner's representative, for inclusion in Operation and Maintenance Manual. Certificates shall include:

    a. Listing of Owner-designated personnel completing training, by name and title.
    b. Name and title of training instructor.
    c. Date(s) of training.
    d. List of topics covered in training sessions.

4. Refer to specific equipment Articles for minimum training period duration for each piece of equipment.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Balancing Air Systems:

a. Constant-volume air systems.
b. Multizone systems.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 REFERENCES AND STANDARDS

A. Associated Air Balance Council (AABC)

1. National Standards for Total System Balance, latest edition.

B. National Environmental Balancing Bureau (NEBB)

1. Procedural Standards for Testing and Balancing of Environmental Systems, latest edition.

1.4 DEFINITIONS

A. The intent of this Section is to use the standards pertaining to the TAB specialist engaged to perform the Work of this Contract, with additional requirements specified in this Section. Contract requirements take precedence over corresponding AABC or NEBB standards requirements. Differences in terminology between the Specifications and the specified TAB organization standards do not relieve the TAB entity engaged to perform the Work of this Contract of responsibility from completing the Work as described in the Specifications.

B. Similar Terms: The following table is provided for clarification only:

Similar Terms		
Contract Term	AABC Term	NEBB Term

TAB Special-ist	TAB Agency	NEBB Certified Firm
TAB Standard	National Standards for Testing and Balancing Heating, Venti-lating, and Air Conditioning Systems	Procedural Standards for Testing, Adjusting, and Balancing of Envi-ronmental Systems
TAB Field Supervisor	Test and Balance Engineer	Test and Balance Supervisor

C. AABC: Associated Air Balance Council.

D. NEBB: National Environmental Balancing Bureau.

E. TAB: Testing, adjusting, and balancing.

F. TAB Organization: Body governing practices of TAB Specialists.

G. TAB Specialist: An entity engaged to perform TAB Work.

1.5 ACTION SUBMITTALS

A. For additional requirements, refer to Section 23 00 50, Basic HVAC Materials and Methods.

1.6 INFORMATIONAL SUBMITTALS

A. For additional requirements, refer to Section 23 00 50, Basic HVAC Materials and Methods.

B. Qualification Data: Within 30 days of Contractor's Notice to Proceed, submit documentation that the TAB specialist and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.

1. Provide list of similar projects completed by proposed TAB field supervisor.
2. Provide copy of completed TAB report, approved by mechanical engineer of record for a completed project with similar system types and of similar complexity.

C. Contract Documents Examination Report: Within 30 days of Contractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3.

1. Submit examinations report with qualifications data.

D. Strategies and Procedures Plan: Within 60 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

E. Interim Reports. Submit interim reports as specified in Part 3. Include list of system conditions requiring correction and problems not identified in Contract Documents examination report.

F. Certified TAB reports.

1. Provide three printed copies of final TAB report. Provide one electronic file copy in PDF format.

G. Sample report forms.

H. Instrument calibration reports, to include the following:

1. Instrument type and make.
2. Serial number.
3. Application.
4. Dates of use.
5. Dates of calibration.

a. Instruments to be used for testing and balancing shall have been calibrated within a period of one year, or less if so recommended by instrument manufacturer and be checked for accuracy prior to start of work.

1.7 CLOSEOUT SUBMITTALS

A. For additional requirements, refer to Section 23 00 50, Basic HVAC Materials and Methods.

B. Certified TAB reports, for inclusion in Operation and Maintenance Manual.

1.8 QUALITY ASSURANCE

A. Independent TAB Specialist Qualifications: Engage a TAB entity certified by AABC or NEBB.

1. The certification shall be maintained for the entire duration of TAB work for this Project. If TAB specialist loses certification during this period, the Contractor shall immediately notify the Architect and submit another TAB specialist for approval. All work specified in this Section and in other related Sections performed by the TAB specialist shall be invalidated if the TAB specialist loses certification, and shall be performed by an approved successor.

B. To secure approval for the proposed TAB specialist, submit information certifying that the TAB specialist is either a first tier subcontractor engaged and paid by the

Contractor, or is engaged and paid directly by the Owner. TAB specialist shall not be affiliated with any other entity participating in Work of this Contract, including design, furnishing equipment, or construction. In addition, submit evidence of the following:

1. TAB Field Supervisor: Full-time employee of the TAB specialist and certified by AABC or NEBB.

    a. TAB field supervisor shall have minimum 10 years supervisory experience in TAB work.

2. TAB Technician: Full-time employee of the TAB specialist and who is certified by AABC or NEBB as a TAB technician.

    a. TAB technician shall have minimum 4 years TAB field experience.

C. TAB Specialist engaged to perform TAB work in this Project shall be a business limited to and specializing in TAB work, or in TAB work and Commissioning.

D. TAB specialist engaged to perform TAB work shall not also perform commissioning activities on this Project.

E. Certified TAB field supervisor or certified TAB technician shall be present at the Project site at all times when TAB work is performed.

1. TAB specialist shall maintain at the Project site a minimum ratio of one certified field supervisor or technician for each non-certified employee at times when TAB work is being performed.

F. Contractor shall notify Architect in writing within three days of receiving direction resulting in reduction of test and balance scope or other deviations from Contract Documents. Deviations from the TAB plan shall be approved in writing by the mechanical engineer of record for the Project.

G. TAB Standard:

1. Perform TAB work in accordance with the requirements of the standard under which the TAB agencies' qualifications are approved unless Specifications contain different or more stringent requirements:

    a. AABC National Standards for Total System Balance, or

    b. NEBB Procedural Standards for Testing, Adjusting, Balancing of Environmental Systems.

2. All recommendations and suggested practices contained in the TAB standard are mandatory. Use provisions of the TAB standard, including checklists and report forms, to the extent to which they are applicable to this Project.
3. Testing, adjusting, balancing procedures, and reporting required for this Project, and not covered by the TAB standard applicable to the TAB specialist engaged

to perform the Work of this Contract, shall be submitted for approval by the design engineer.

H. TAB Conference: Meet with Owner and mechanical engineer on approval of the TAB strategies and procedures plan to develop a mutual understanding of the project requirements. Require the participation of the TAB field supervisor. Provide seven days' advance notice of scheduled meeting time and location. TAB conference shall take place at.

1. Agenda Items:

   a. The Contract Documents examination report.
   b. The TAB plan.
   c. Coordination and cooperation of trades and subcontractors.
   d. Coordination of documentation and communication flow, including protocol for resolution tracking and documentation.

2. The requirement for TAB conference may be waived at the discretion of the mechanical engineer of record for the Project.

I. Certify TAB field data reports and perform the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.

J. TAB Report Forms: Use standard TAB specialist's forms approved by Architect.

K. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.9 PROJECT CONDITIONS

A. Full Owner Occupancy: Owner will occupy the site and existing building during entire TAB period. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

1.10 WARRANTY

A. Provide workmanship and performance warranty applicable to TAB specialist engaged to perform Work of this Contract:

1. AABC Performance Guarantee.
2. NEBB Quality Assurance Program.

B. Refer to Division 01 Specifications for additional requirements.

1.11 COORDINATION

A. Notice: Provide seven days' advance notice for each test. Include scheduled test dates and times.

B. Perform TAB after leakage and pressure tests on air distribution systems have been satisfactorily completed.

C. Coordinate TAB work with work of other trades.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Contract Documents Examination Report:

1. TAB specialist shall review Contract Documents, including plans and specifications. Provide report listing conditions that would prevent the system(s) from operating in accordance with the sequence of operations specified, or would prevent accurate testing and balancing:

    a. Identify each condition requiring correction using equipment designation shown on Drawings. Provide room number, nearest building grid line intersection, or other information necessary to identify location of condition requiring correction.
    b. Proposed corrective action necessary for proper system operation.

B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine equipment performance data including fan and pump curves.

1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

F. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

G. Examine test reports specified in individual system and equipment Sections.

H. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

I. Examine strainers. Verify that startup screens are replaced by permanent screens with indicated perforations.

J. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

K. Examine operating safety interlocks and controls on HVAC equipment.

L. Report conditions requiring correction discovered before and during performance of TAB procedures.

M. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures. TAB plan shall be specific to Project and include the following:

1. General description of each air system and sequence(s) of operation.
2. Complete list of measurements to be performed.
3. Complete list of measurement procedures. Specify types of instruments to be utilized and method of instrument application.
4. Qualifications of personnel assigned to Project.
5. Single-line CAD drawings reflecting all test locations (terminal units, grilles, diffusers, traverse locations, etc.
6. Air terminal correction factors for the following:

    a. Air terminal configuration.
    b. Flow direction (supply or return/exhaust).
    c. Effective area of each size and type of air terminal.
    d. Air density.

B. Complete system-readiness checks and prepare reports. Verify the following:

1. Permanent electrical-power wiring is complete.
2. Automatic temperature-control systems are operational.
3. Equipment and duct access doors are securely closed.
4. Balance, smoke, and fire dampers are open.
5. Isolating and balancing valves are open and control valves are operational.
6. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
7. Windows and doors can be closed so indicated conditions for system operations can be met.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance" or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and in this Section.

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
2. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 238000 Heating, Ventilating, and Air Conditioning."

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Test each system to verify building or space operating pressure, including all stages of economizer cycle. Maximum building pressure shall not exceed 0.03 inches of pressure.

C. Except as specifically indicated in this Specification, Pitot tube traverses shall be made of each duct to measure airflow. Pitot tubes, associated instruments, traverses, and techniques shall conform to ASHRAE Handbook, HVAC Applications, and ASHRAE Handbook, HVAC Systems and Equipment.
1. Use state-of-the-art instrumentation approved by TAB specialists governing agency..
2. Where ducts' design velocity and air quantity are both less than 1000 fpm/CFM, air quantity may be determined by measurements at terminals served.

D. Test holes shall be placed in straight duct, as far as possible downstream from elbow, bends, take-offs, and other turbulence-generating devices.

E. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

F. Check airflow patterns from the outdoor-air louvers and dampers and the return- and exhaust-air dampers through the supply-fan discharge and mixing dampers.

G. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

H. Verify that motor starters are equipped with properly sized thermal protection.

I. Check dampers for proper position to achieve desired airflow path.

J. Check for airflow blockages.

K. Check condensate drains for proper connections and functioning.

L. Check for proper sealing of air-handling-unit components.

M. Verify that air duct system is sealed as specified in Section 238000 “Heating, Ventilating, and Air Conditioning.”

N. Provide for adjustments or modifications to fan and motor sheaves, belts, damper linkages, and other components as required to achieve specified air balance at no additional cost to Owner.

O. Automatically operated dampers shall be adjusted to operate as indicated in Contract Documents. Controls shall be checked for proper calibration.

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.

1. Measure total airflow.

    a. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow. Alternative methods shall be examined for determining total CFM, i.e., Pitot-tube traversing of branch ducts, coil or filter velocity profiles, prior to utilizing airflow values at terminal outlets and inlets.

2. Measure fan static pressures as follows to determine actual static pressure:

    a. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.
    b. Measure static pressure directly at the fan outlet.
    c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.
    d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.

3. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.

a. Report the cleanliness status of filters and the time static pressures are measured.

4. Measure static pressures entering and leaving other devices, such as sound traps, heat-recovery equipment, and air washers, under final balanced conditions.
5. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
6. Obtain approval from Architect for adjustment of fan speed higher or lower than indicated speed. Comply with requirements in HVAC Sections for air-handling units for adjustment of fans, belts, and pulley sizes to achieve indicated air-handling-unit performance.
7. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.

B. Check operation of outside air dampers. Measure total outside air quantity at each stage of normal, economizer, power exhaust, or power exhaust economizer operation, as applicable to installed equipment. Adjust outside air dampers to provide 100 percent outside air in economizer mode. Ensure that outside air dampers close completely upon unit shutdown.

C. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.

1. Measure airflow of submain and branch ducts.

a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.

2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.
3. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.

D. Measure air outlets and inlets without making adjustments.

1. Measure terminal outlets using a direct-reading digital backflow compensating hood. Use outlet manufacturer's written instructions and calculating factors only when direct-reading hood cannot be used due to physical obstruction or other limiting factors. Final report shall indicate where values listed have not been obtained by direct measurement.

E. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.

1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents, if included.
2. Adjust patterns of adjustable outlets for proper distribution without drafts. Terminal air velocity at five feet above finished floor shall not exceed 50 feet per minute in occupied air conditioned spaces.

F. Do not overpressurize ducts.

3.6 PROCEDURES FOR MULTIZONE SYSTEMS

A. Comply with applicable requirements for constant-volume air systems in addition to those listed below.

B. Set unit at maximum airflow through the cooling coil.

C. Adjust each zone's balancing damper to achieve indicated airflow within the zone.

3.7 PROCEDURES FOR MOTORS

A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:

1. Manufacturer's name, model number, and serial number.
2. Motor horsepower rating.
3. Motor rpm.
4. Efficiency rating.
5. Nameplate and measured voltage, each phase.
6. Nameplate and measured amperage, each phase.
7. Starter manufacturer’s name, model number, size, type, and thermal-protection-element rating.

    a. Starter strip heater size, type, and rating.

B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass of the controller to prove proper operation. Record observations including name of controller manufacturer, model number, serial number, and nameplate data.

3.8 PROCEDURES FOR CONDENSING UNITS

A. Verify proper rotation of fans.

B. Measure entering- and leaving-air temperatures.

C. Record compressor data.

3.9 PROCEDURES FOR HEAT-TRANSFER COILS

A. Measure, adjust, and record the following data for each refrigerant coil:

1. Dry-bulb temperature of entering and leaving air.
2. Wet-bulb temperature of entering and leaving air.
3. Airflow.
4. Air pressure drop.

3.10 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

A. Perform a preconstruction inspection of existing equipment that is to remain and be reused.

1. Measure and record the operating speed, airflow, and static pressure of each fan.
2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
3. Check the condition of filters.
4. Check the condition of coils.
5. Check the operation of the drain pan and condensate-drain trap.
6. Check bearings and other lubricated parts for proper lubrication.
7. Report on the operating condition of the equipment and the results of the measurements taken. Report conditions requiring correction.

B. Before performing testing and balancing of existing systems, inspect existing equipment that is to remain and be reused to verify that existing equipment has been cleaned and refurbished. Verify the following:

1. New filters are installed.
2. Coils are clean and fins combed.
3. Drain pans are clean.
4. Fans are clean.
5. Bearings and other parts are properly lubricated.
6. Conditions requiring correction noted in the preconstruction report are corrected.

C. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.

1. Compare the indicated airflow of the renovated work to the measured fan airflows, and determine the new fan speed and the face velocity of filters and coils.

2. Verify that the indicated airflows of the renovated work result in filter and coil face velocities and fan speeds that are within the acceptable limits defined by equipment manufacturer.
3. If calculations increase or decrease the air flow rates and water flow rates by more than 5 percent, make equipment adjustments to achieve the calculated rates. If increase or decrease is 5 percent or less, equipment adjustments are not required.
4. Balance each air outlet.

3.11 TOLERANCES

A. Set HVAC system's air flow rates and water flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus 10 percent and minus 0 percent .
2. Air Outlets and Inlets: Plus 5 percent and minus 5 percent .
3. Multiple outlets within single room: Plus 5 percent and minus 0 percent for total airflow within room. Tolerance for individual outlets within a single room having multiple outlets shall be as for “Air Outlets and Inlets”.

B. Set plumbing systems water flow rates within plus or minus 10 percent.

3.12 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Interim Reports: Prepare periodic lists of conditions requiring correction and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.13 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing field supervisor. Report shall be co-signed by the Contractor, attesting that he has reviewed the report, and the report has been found to be complete and accurate.
2. The certification sheet shall be followed by sheet(s) listing items for which balancing objectives could not be achieved. Provide explanation for failure to achieve balancing objectives for each item listed.

3. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:
   1. Fan curves.
   2. Manufacturers' test data.
   3. Field test reports prepared by system and equipment installers.
   4. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:

   1. Title page.
   2. Name and address of the TAB specialist.
   3. Project name.
   4. Project location.
   5. Project Performance Guaranty
   6. Architect's name and address.
   7. Engineer's name and address.
   8. Contractor's name and address.
   9. Report date.
   10. Signature of TAB supervisor who certifies the report.
   11. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
   12. Summary of contents including the following:

      a. Indicated versus final performance.
      b. Notable characteristics of systems.
      c. Description of system operation sequence if it varies from the Contract Documents.

   13. Nomenclature sheets for each item of equipment.
   14. Test conditions for fans and pump performance forms including the following:

      a. Settings for outdoor-, return-, and exhaust-air dampers.
      b. Conditions of filters.
      c. Cooling coil, wet- and dry-bulb conditions.
      d. Face and bypass damper settings at coils.
      e. Fan drive settings including settings and percentage of maximum pitch diameter.
      f. Inlet vane settings for variable-air-volume systems.
      g. Settings for supply-air, static-pressure controller.
      h. Other system operating conditions that affect performance.

D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:

   1. Quantities of outdoor, supply, return, and exhaust airflows.
   2. Duct, outlet, and inlet sizes.
   3. Pipe and valve sizes and locations.
   4. Position of balancing devices.

E. Air distribution outlets and inlets shall be shown on keyed plans with designation for each outlet and inlet matching designation used in Contract Documents and TAB test reports. Room numbers shall be included in keyed plans and test reports. Where multiple outlets and inlets are installed within a single room, a designation shall be assigned and listed for each outlet and inlet in addition to room number.

F. Test Reports – General:

1. All test reports containing air or liquid flow data shall record flow values prior to system adjustment in addition to required data listed for each test report.

G. Apparatus-Coil Test Reports:

1. Coil Data:

a. System identification.
b. Location.
c. Coil type.
d. Number of rows.
e. Fin spacing in fins per inch o.c.
f. Make and model number.
g. Face area in sq. ft.
h. Tube size in NPS.
i. Tube and fin materials.
j. Circuiting arrangement.

2. Test Data (Indicated and Actual Values):

a. Air flow rate in cfm.
b. Average face velocity in fpm.
c. Air pressure drop in inches wg.
d. Outdoor-air, wet- and dry-bulb temperatures in deg F.
e. Return-air, wet- and dry-bulb temperatures in deg F.
f. Entering-air, wet- and dry-bulb temperatures in deg F.
g. Leaving-air, wet- and dry-bulb temperatures in deg F.
h. Refrigerant expansion valve and refrigerant types.

H. Fan Test Reports: For supply, return, and exhaust fans, include the following:

1. Fan Data:

a. System identification.
b. Location.
c. Make and type.
d. Model number and size.
e. Manufacturer's serial number.
f. Arrangement and class.
g. Sheave make, size in inches, and bore.
h. Center-to-center dimensions of sheave, and amount of adjustments in inches.

2. Motor Data:

    a. Motor make, and frame type and size.
    b. Horsepower and rpm.
    c. Volts, phase, and hertz.
    d. Full-load amperage and service factor.
    e. Sheave make, size in inches, and bore.
    f. Center-to-center dimensions of sheave, and amount of adjustments in inches.
    g. Number, make, and size of belts.

3. Test Data (Indicated and Actual Values):

    a. Total airflow rate in cfm.
    b. Total system static pressure in inches wg.
    c. Fan rpm.
    d. Discharge static pressure in inches wg.
    e. Suction static pressure in inches wg.

I. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:

1. Report Data:

    a. System and air-handling-unit number.
    b. Location and zone.
    c. Traverse air temperature in deg F.
    d. Duct static pressure in inches wg.
    e. Duct size in inches.
    f. Duct area in sq. ft..
    g. Indicated air flow rate in cfm.
    h. Indicated velocity in fpm.
    i. Actual air flow rate in cfm.
    j. Actual average velocity in fpm.
    k. Barometric pressure in psig.

J. Air-Terminal-Device Reports:

1. Unit Data:

    a. System and air-handling unit identification.
    b. Location and zone.
    c. Apparatus used for test.
    d. Area served.
    e. Make.
    f. Number from system diagram.
    g. Type and model number.
    h. Size.
    i. Effective area in sq. ft.

2. Test Data (Indicated and Actual Values):

    a. Air flow rate in cfm.
    b. Air velocity in fpm.
    c. Preliminary air flow rate as needed in cfm.
    d. Preliminary velocity as needed in fpm.
    e. Final air flow rate in cfm.
    f. Final velocity in fpm.
    g. Space temperature in deg F.

K. Instrument Calibration Reports:

1. Report Data:

    a. Instrument type and make.
    b. Serial number.
    c. Application.
    d. Dates of use.
    e. Dates of calibration.

3.14 INSPECTIONS

A. Initial Inspection:

1. After testing and balancing are complete, operate each system and randomly check measurements to verify that the system is operating according to the final test and balance readings documented in the final report.
2. Check the following for each system:

    a. Measure airflow of at least 10 percent of air outlets.
    b. Measure water flow of at least 5 percent of terminals.
    c. Measure room temperature at each thermostat/temperature sensor. Compare the reading to the set point.
    d. Verify that balancing devices are marked with final balance position.
    e. Note deviations from the Contract Documents in the final report.

B. Final Inspection:

1. After initial inspection is complete and documentation by random checks verifies that testing and balancing are complete and accurately documented in the final report, request that a final inspection be made by Owner.
2. The TAB specialist's test and balance engineer shall conduct the inspection in the presence of Owner.
3. Owner shall randomly select measurements, documented in the final report, to be rechecked. Rechecking shall be limited to either 10 percent of the total measurements recorded or the extent of measurements that can be accomplished in a normal 8-hour business day.

4. If rechecks yield measurements that differ from the measurements documented in the final report by more than 10 percent, the measurements shall be noted as "FAILED."
5. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.

C. TAB Work will be considered defective if it does not pass final inspections. If TAB Work fails, proceed as follows:

1. Recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes; resubmit the final report and request a second final inspection.
2. If the second final inspection also fails, Owner may contact the TAB specialists' governing organization for remedial action by the governing organization under the workmanship and performance warranty. See article, Warranty.
3. If remedial action is not provided by the TAB specialists' governing organization in a timely manner, Owner may contract the services of another TAB specialist to complete the TAB Work according to the Contract Documents and deduct the cost of the services from the original TAB specialists' final payment.

D. Prepare test and inspection reports.

3.15 ADDITIONAL TESTS

A. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional TAB during near-peak summer and winter conditions.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

A. Refer to Basic Mechanical Requirements Section, for general mechanical requirements.

B. Refer to Mechanical Division for installation of instrument wells, valve bodies, dampers, etc. in mechanical systems.

C. Provide the following electrical work as work of this Section, complying with requirements of Electrical Division, and as outlined below:

1. All control wiring between field-installed controls, indicating devices, and unit control panels.
2. Interlock wiring between electrically interlocked devices, sensors, and between a hand or auto position of motor starters as indicated.
3. Wiring associated with indicating and alarm panels (remote alarm panels) and connections to their associated field devices.
4. Contractor shall provide and extend low voltage power source wiring required for operation of control devices provided.
5. Wiring for fully complete and functional controls system and as specified.

1.2 SUBMITTALS: IN ACCORDANCE WITH DIVISION 1

A. Product Data: Submit manufacturer's specifications for each control device furnished, including installation instructions and start-up instructions. Submit integrated wiring and electrical diagram to show complete system operation.

B. All submittals must be received and approved by the Owner prior to the ordering and installation of any equipment by the Contractor.

1. Provide the Owner with a Building Controls submittal with the following:
    a. System Hardware
    b. System Architecture
    c. Complete System Wiring Schematic

C. Submit shop drawings showing construction and mounting details for review prior to construction. In addition, submit the following for review prior to panel and/or system fabrication and installation:

1. Field wiring diagrams showing wiring external to panel.
2. Panel internal wiring diagrams also showing panel terminal connections for external wiring, properly coordinated and keyed to external wiring diagram.
3. Designation of all switches, pilot lights, etc. and layout of instruments, switches, and nameplates of panel.

1.3 COORDINATION:

A. Automatic temperature control systems work shall be accomplished as outlined below:

1. Control Valves furnished under this section shall be installed as specified in Mechanical Division.
2. Control Dampers are provided under the applicable Mechanical Division air distribution or air handling equipment section.
3. Water Pressure Taps, Thermal Wells, Flow Switches, Flow Meters, that will have wet surfaces furnished under this Section, shall be installed as specified in Mechanical Division.
4. Controlled Equipment Power Wiring shall be furnished and installed under Electrical Division. Where control involves 120V control devices controlling 120V equipment, the Division 16 Electrical Contractor shall extend power wiring to the equipment and shall extend it from the equipment to the control device.

1.4 INSTALLING CONTRACTOR QUALIFICATIONS:

A. The Building Automation System Control System contractor must have been in business, and licensed as a contractor by the State of California, installing HVAC and building automation controls, and fire/life safety systems, for a minimum of ten (10) years preceding the bid opening.

B. The Building Automation Control System contractor must have completed no less than one (1) control system installation, within twenty-four (24) months preceding the bid opening, pursuant to a single written contract, valued at no less than three hundred thousand ($300,000) dollars.

C. The Building Automation Control System contractor must demonstrate that, from the local office that will service the Owner with a four (4) hour emergency response requirement can logistically be provided.

D. Controls contractor must have direct access to factory certified instructors to provide training upon request of the district.

E. Controls contractor must have explicit district approval to interface with district wide server for integration of new controls system.

F. The Building Automation Control System contractor must have been, for five (5) years preceding the bid opening, a factory branch office, or a factory authorized dealer for the product manufacturer type identified in subsection 2.01, A., under PART 2 – PRODUCTS, of this section. Factory authorized dealer means:

1. Installing Contractor has a contract directly with the factory. A contract with a distributor is not acceptable.
2. Installing Contractor has direct access to factory technical support and training.

PART 2 - PRODUCTS

2.1 GENERAL:

A. Manufacturer: The Building Automation Control System shall be provided by the following:

1. Controls are to be provided by Johnson Controls, Inc., branch office in Folsom, CA to match campus standard. Please Contact Zac Dillow @ 925-719-7785
2. No other contractors are acceptable or will be considered
3. The Building Automation Controls contractor must have been, for ten (10) years preceding the bid opening, a factory branch office. A contract with a distributer is not acceptable.

B. All new controls material must be fully integrated and graphically represented on existing district building automation controls system on the districts servers. Only district authorized personnel may access this server for controls integration.

C. All components used shall be serviceable, repairable, and replaceable by qualified temperature control technicians using non-proprietary parts, tools, and instruments.

2.2 SUPERVISORY CONTROLLER

A. NETWORK AUTOMATION ENGINE (NAE)

1. The NAE shall perform the function of monitoring all system variables, both from real hardware points, software variables, and controller parameters such as set points.
2. NAE's shall be entirely solid state devices. No rigid disk drives will be permitted in the equipment rooms.
3. The NAE's shall manage and direct all information traffic on the Tier 1 network, between the Tier 1 and Tier2 networks, and to servers.
4. Any NAE on the Tier 1 network shall be equipped with all software necessary to drive the complete user interface including graphics on a browser connected to the NAE via the network or directly via a local port on the node.
5. The operating system of the NAE shall support multi-user access. At minimum four users shall be able to access the same NAE simultaneously.
6. Communication between NAE's shall be per-to-peer via 10/100 Ethernet using the BACnet protocol.
7. The NAE shall be capable of direct connection to multiple field busses using different protocols simultaneously as indicated below. Should the controller not support multiple field busses, install two supervisory controllers side by side.
    a. An RS-485 serial field bus such as BACnet MSTP or the manufacturer's proprietary field bus – JCI N2.
    b. A LON field bus for supervision and control of LON based controllers that conform to the Lon Talk standard.
8. The NAE will integrate data from both field busses into a common object structure. Data from both field busses will appear in common displays throughout the user interface in exactly the same format. It shall not be possible to determine which field buss the data originated on without reviewing the system configuration data.
9. The NAE shall be programmable and governed by the requirements of their applicable codes, approvals and regulations.
10. The NAE shall be designed, packaged, installed, programmed and commissioned in consideration of their specific service and prevailing operating conditions. They shall be

proven standard product of their original manufacturer and not a custom product for this Project.

11. A failure at an NAE shall not cause failures or non-normal operation at any other system NAE other than the possible loss of active real-time information from the failed NAE.
12. Ancillary NAE equipment, including interfaces and power supplies, shall not be operated at more than 80% of their rated service capacity.
13. The NAE shall comply with FCC Part 15 subpart J class A emission requirements.
14. Each NAE shall be equipped with the necessary un-interruptible power such that it will not cease operation during minor power outages, including those that occur upon transfer to emergency generator or other local power source not provided by the utility.

2.3 NETWORKING/COMMUNICATIONS:

A. The design of the Building Automation Control System shall network operator workstations and Standalone DDC Panels as shown on the attached system configuration drawing. Inherent in the system's design shall be the ability to expand or modify the network(s) either via the local area network, or auto-dial telephone line modem connections, or via a combination of the two networking schemes.

1. Local Area Network

   a. Workstation/DDC Panel Support: Operator workstations and DDC panels shall directly reside on a local area network such that communications may be executed directly between controllers, directly between workstations, and between controllers and workstations on a peer-to-peer basis.

   b. Dynamic Data Access: All operator devices, either network resident or connected via dial-up modems, shall have the ability to access all point status and application report data, or execute control functions for any and all other devices via the local area network. Access to data shall be based upon logical identification of building equipment. Access to system data shall not be restricted by the hardware configuration of the Building Automation Control System. The hardware configuration of the Building Automation Control System network shall be totally transparent to the user when accessing data or developing control programs.

   c. General Network Design: Network design shall include the following provisions:

      1) High-speed data transfer rates for alarm reporting, quick report generation from multiple controllers and upload/download efficiency between network devices. The minimum baud rate shall be one (1) Megabaud.

      2) Support of any combination of controllers and operator workstations directly connected to the local area network. A minimum of fifty (50) devices shall be supported on a single local area network.

      3) Detection and accommodation of single or multiple failures of either workstations, DDC panels or the network media. The network shall include provisions for automatically reconfiguring itself to allow all operational equipment to perform their designated functions as effectively as possible in the event of single or multiple failures.

      4) Message and alarm buffering to prevent information from being lost.

      5) Error detection, correction, and retransmission to guarantee data integrity.

6) Default device definition to prevent loss of alarms or data, and ensure alarms are reported as quickly as possible in the event an operator device does not respond.

7) Commonly available, multiple sourced, networking components and protocols shall be used to allow the Building Automation Control System to coexist with other networking applications such as office automation. MAP, ETHERNET, IBM Token Ring and ARCNET are acceptable technologies.

8) Use of an industry standard IEEE 802.x protocol. Communications must be of a deterministic nature to assure calculable performance under worst-case network loading.

9) Synchronization of the real-time clocks in all DDC panels shall be provided.

2.4 APPLICATION SPECIFIC CONTROLLERS - HVAC APPLICATIONS:

A. Each Standalone DDC Controller shall be able to extend its performance and capacity through the use of remote Application Specific Controllers (ASCs).

B. Each ASC shall operate as a standalone controller capable of performing its specified control responsibilities independently of other controllers in the network. Each ASC shall be a microprocessor-based, multi-tasking, real-time digital control processor.

C. Each ASC shall have sufficient memory to support its own operating system and data base including:

1. Control Processes
2. Energy Management Applications
3. Operator I/O (Portable Service Terminal)

D. The operator interface to any ASC point data or programs shall be through any network-resident PC workstation, or any PC or portable operator's terminal connected to any DDC panel in the network.

E. Application Specific Controllers shall directly support the temporary use of a portable service terminal. The capabilities of the portable service terminal shall include but not be limited to the following:

1. Display temperatures
2. Display status
3. Display setpoints
4. Display control parameters
5. Override binary output control
6. Override analog setpoints
7. Modification of gain and offset constants

F. Powerfail Protection: All system setpoints, proportional bands, control algorithms, and any other programmable parameters shall be stored such that a power failure of any duration does not necessitate reprogramming the controller.

G. Application Description:

1. Field Equipment Controller (FEC) – BY JCI
   a. When indoors - the FEC shall operate as a standard from 32 to 122 degrees Fahrenheit ambient air temperature and 10 to 90% relative humidity.
   b. When outdoors mounted either in unit cabinet or mounted in a steel enclosure – the FEC shall operate from -40 to 158 degrees Fahrenheit ambient air temperature and 10 to 90% relative humidity.
   c. The Field Equipment Controller (FEC) shall be a fully user-programmable, digital controller that communicates via BACnet MS/TP protocol.
   d. The FEC shall employ a finite state control engine to eliminate unnecessary conflicts between control functions at crossover points in their operational sequences. Suppliers using non-state based DDC shall provide separate control strategy diagrams for all controlled functions in their submittals.
   e. Controllers shall be factory programmed with a continuous adaptive tuning algorithm that senses changes in the physical environment and continually adjusts loop tuning parameters appropriately. Controllers that require manual tuning of loops or perform automatic tuning on command only shall not be acceptable.
   f. The FEC shall be assembled in a plenum-rated plastic housing with flammability rated to UL94-5VB.
   g. The FEC shall include a removable base to allow pre-wiring without the controller.
   h. The FEC shall include troubleshooting LED indicators to identify the following conditions:
      1) Power On
      2) Power Off
      3) Download or Startup in progress, not ready for normal operation
      4) No Faults
      5) Device Fault
      6) Field Controller Bus - Normal Data Transmission
      7) Field Controller Bus - No Data Transmission
      8) Field Controller Bus - No Communication
      9) Sensor-Actuator Bus - Normal Data Transmission
      10) Sensor-Actuator Bus - No Data Transmission
      11) Sensor-Actuator Bus - No Communication
   i. The FEC shall accommodate the direct wiring of analog and binary I/O field points.
   j. The FEC shall support the following types of inputs and outputs:
      1) Universal Inputs - shall be configured to monitor any of the following:
         a) Analog Input, Voltage Mode
         b) Analog Input, Current Mode
         c) Analog Input, Resistive Mode
         d) Binary Input, Dry Contact Maintained Mode
         e) Binary Input, Pulse Counter Mode

2) Binary Inputs - shall be configured to monitor either of the following:
   a) Dry Contact Maintained Mode
   b) Pulse Counter Mode
3) Analog Outputs - shall be configured to output either of the following
   a) Analog Output, Voltage Mode
   b) Analog Output, current Mode
4) Binary Outputs - shall output the following:
   a) 24 VAC Triac
5) Configurable Outputs - shall be capable of the following:
   a) Analog Output, Voltage Mode
   b) Binary Output Mode

k. The FEC shall have the ability to reside on a Field Controller Bus (FC Bus).
   1) The FC Bus shall be a Master-Slave/Token-Passing (MS/TP) Bus supporting BACnet Standard protocol SSPC-135, Clause 9.
   2) The FC Bus shall support communications between the FECs and the NAE.
   3) The FC Bus shall also support Input/Output Module (IOM) communications with the FEC and with the NAE.
   4) The FC Bus shall support a minimum of 100 IOMs and FEC in any combination.
   5) The FC Bus shall operate at a maximum distance of 15,000 ft. between the FEC and the furthest connected device.

l. The FEC shall have the ability to monitor and control a network of sensors and actuators over a Sensor-Actuator Bus (SA Bus).
   1) The SA Bus shall be a Master-Slave/Token-Passing (MS/TP) Bus supporting BACnet Standard protocol SSPC-135, Clause 9.
   2) The SA Bus shall support a minimum of 10 devices per trunk.
   3) The SA Bus shall operate at a maximum distance of 1,200 ft. between the FEC and the furthest connected device.

m. The FEC shall have the capability to execute complex control sequences involving direct wired I/O points as well as input and output devices communicating over the FC Bus or the SA Bus.

n. The FEC shall support, but not be limited to, the following:
   1) Hot water, chilled water/central plant applications
   2) Built-up air handling units for special applications
   3) Terminal units
   4) Special programs as required for systems control

H. Field Devices
   1. Input/Output Module (IOM) – BY JCI

a. The IOM shall operate as a standard from 32 to 122 degrees Fahrenheit ambient air temperature and 10 to 90% relative humidity
b. The Input/Output Module (IOM) provides additional inputs and outputs for use in the FEC.
c. The IOM shall communicate with the FEC over either the FC Bus or the SA Bus using BACnet Standard protocol SSPC-135, Clause 9.
d. The IOM shall be assembled in a plenum-rated plastic housing with flammability rated to UL94-5VB.
e. The IOM shall have a minimum of 4 points to a maximum of 17 points.
f. The IOM shall support the following types of inputs and outputs:
    1) Universal Inputs - shall be configured to monitor any of the following:
        a) Analog Input, Voltage Mode
        b) Analog Input, Current Mode
        c) Analog Input, Resistive Mode
        d) Binary Input, Dry Contact Maintained Mode
        e) Binary Input, Pulse Counter Mode
    2) Binary Inputs - shall be configured to monitor either of the following:
        a) Dry Contact Maintained Mode
        b) Pulse Counter Mode
    3) Analog Outputs - shall be configured to output either of the following:
        a) Analog Output, Voltage Mode
        b) Analog Output, current Mode
    4) Binary Outputs - shall output the following:
        a) 24 VAC Triac
    5) Configurable Outputs - shall be capable of the following:
        a) Analog Output, Voltage Mode
        b) Binary Output Mode
g. The IOM shall include troubleshooting LED indicators to identify the following conditions:
    1) Power On
    2) Power Off
    3) Download or Startup in progress, not ready for normal operation
    4) No Faults
    5) Device Fault
    6) Normal Data Transmission
    7) No Data Transmission
    8) No Communication

2. Network Sensors (NS)

a. The Network Sensors (NS) shall have the ability to monitor the following variables as required by the systems sequence of operations:
   1) Zone Temperature
   2) Zone humidity
   3) Zone setpoint
b. The NS shall transmit the zone information back to the controller on the Sensor-Actuator Bus (SA Bus) using BACnet Standard protocol SSPC-135, Clause 9.
c. The Network Sensors shall include the following items:
   1) A backlit Liquid Crystal Display (LCD) to indicate the Temperature, Humidity and Setpoint.
   2) An LED to indicate the status of the Override feature.
   3) A button to toggle the temperature display between Fahrenheit and Celsius.
   4) A button to initiate a timed override command
d. The NS shall be available with either screw terminals or phone jack.
e. The NS shall be available in either surface mount or wall mount styles.

2.5 TEMPERATURE CONTROL MATERIAL:

A. PANEL DEVICES

PART #	DESCRIPTION	MFTR
DCP-1.5-W	1.5 AMP POWER SUPPLY	KELE
DPT2640-005D	PRESSURE SENS, DP, 0-5”WC	SETRA
RH2B-UAC24-L	DPDT, 10A, HC=24 VAC, W/LED	IDEC
SH2B-05	DPDT RELAY BASE FOR RH2B	IDEC
RH4B-UAC24V	4PDT, 10A, HC=24 VAC	IDEC
SH4B-05	4PDT RELAY BASE FOR RH4B	IDEC
PXPLX01S	DP TRANSDUCER, AIR, 0-1”	VERIS
1900-5MR	HIGH STATIC PRESS. SWITCH	DWYER
BAM2	TB END STOP	KELE
FEM6	TB END STOP SECTION	KELE
M4/6	TERMINAL BLOCK	KELE
RC610B	TB BLANK MARKING STRIPS	KELE
Y65A13-0	120VAC/24VAC, FOOT, 40VA	JCI
Y65A21-0	120VAC/24VAC, PLATE, 40VA	JCI

B. TRANSDUCERS

PART #	DESCRIPTION	MFTR
A-306	OUTDOOR AIR STATIC	KELE
DPT-2015-1	DIFF PRESS TRANSMITTER	JCI
DPT2090-250G	PRESS SENS, GAGE, 250 PSI, VDC	SETRA
DPT2640-0R1B	PRESS SENS, DP, -0.1-0.1”WC, VDC	SETRA
DPT2640-2R5D	PRESS SENS, DP, 0-2.5”WC, VDC	SETRA
FTG18A-600R	REMOTE MTD PROBE	JCI
PWLX03S	DIFF PRESS, WATER, 0-25PSI	VERIS

C. SENSORS

PART #	DESCRIPTION	MFTR
TE-6000-1	SENSOR, T-NI, 1.0%, STRAP-ON	JCI
TE-6001-3	KIT, MTG BOX FOR WZ-1000 WELL	JCI
TE-6313P-1	SENSOR, T-NI 0.1%, 3IN OAT	JCI
TE-6316P-1	SENSOR, T-NI, 0.1%, 17FT AVG	JCI
TE-6311V-2	DUCT PROBE TEMP. SEN. 1K	JCI
TE-67NP-0N00	SENSOR, RM, 1K, NI, PHONE JACK	JCI
TE-67NT-0N00	TEMP SENSOR 1K NICKEL	JCI
NS-BTP7002-0	ZONE TEMP SENSOR/SETPT	JCI
NS-BTP7003-0	ADDRESSABLE ZONE TEMP	JCI
NS-BCN7004-0	CO2 SENSOR	JCI
A/1KHT-2W-RP	REMOTE PROBE,-40-842, PT, 1K	ACI
A11A-1C	PLN, MLT, SP=35-45 F, STG=1	JCI
TEC-2601-4	1 HEAT/1 COOL BACnet STAT	JCI
LX-24	CEILING MOUNT OCC SENSOR	KELE
ST-S63-XH	S.S ZONE TEMP WITH OCC OVR	KELE

D. FIELD DEVICES

PART #	DESCRIPTION	MFTR
H922	CURENT SENSOR, SPLIT	VERIS
ST-S63-XM	STAINLESS STEEL ZONE TEMP	KELE
TS-400-24-W	DIGITAL TIME SWITCH	KELE
TS-470	END SWITCH, NO	KELE
WZ-1000-5	WELL, BRASS, 2-3/8 IN, ½ IN NPT	JCI
M9104-AGS-2N	ELEC, INCR, NSR, TQ=35	JCI
M9220-BGA-3	DAMPER ACTUATOR 20 NM SR	JCI
MS-FEC2611-0ET	OUTDOOR FEC	JCI
MS-FEC2611	INDOOR FEC	JCI
MS-NAE4510-2	MEDIUM CAPACITY NAE	JCI
MS-NAE5510-2	HIGH CAPACITY NAE	JCI

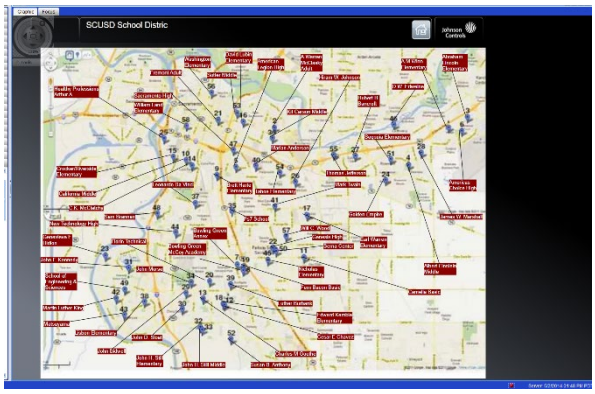
E. Motorized Control Dampers: Shall be parallel blade for two-position control and opposed blade for proportional control applications. Dampers shall have an enamel finish or be galvanized, with nylon bearings. Blade edge and tip seals shall be included for all dampers. Blade shall be double piece 22 gauge minimum and 8” wide maximum and frame shall be welded channel iron.

F. Temperature control panels (TCP): Shall be of NEMA code gauge steel with locking doors for mounting all devices as shown. They shall meet all applicable requirements of Title 24, California Code of Regulations. All controllers, relays, switches, etc. for equipment located in mechanical equipment rooms shall be mounted in a TCP as shown on the drawings. Temperature settings, adjustments and calibration shall be done at the TCP. Any required UCMC Campus Data networks connection for this panel shall be installed inside the panel. All electric devices within a control panel shall be factory pre-piped and wired. Provide engraved laminated plastic nameplates identifying all devices mounted on the face of the control panels. A complete set of related "as-builts" control drawings shall be furnished in each control panel.

2.6 GRAPHIC INTERFACE

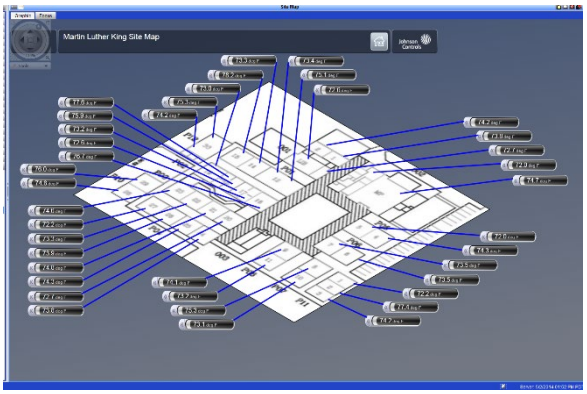
A. The following are examples of the district wide standard for the graphical interface of the controls system. The new controls system must be graphically represented according to the following templates

1. District Map View

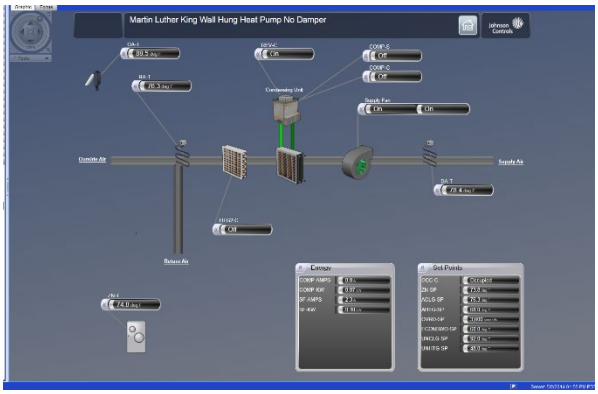


2. School Overview

3. Zone Overview



4. Equipment Overview



2.7 CONSULTATIVE SUPPORT

A. For this project, the manufacturer shall provide at a minimum 8 hours of consultative support services to review and provide recommendations and enhancements to the system, which may include:

1. Review of critical programming loops and adjustments as necessary
2. Adjustments to improve building system operation, reduce energy consumption and/or improve environmental control
3. Implementation or enhancement of functionality in the system

2.8 MISCELLANEOUS DEVICES

A. Moisture Sensors:

1. Moisture sensors shall be used to detect water in elevator sumps and chilled water fan coil unit overflow drain pans and where otherwise indicated on the Drawings using George Risk Industries Model GRI 2650, Veris MX Series, or equal.
2. The sensor shall be floor mounted operating at 24 VAC with SPDT relay for the output signal with automatic reset.

PART 3 - EXECUTION

3.1 GENERAL:

A. Furnish all labor, materials, equipment, and service necessary for a complete and operating Direct Digital Control Building Automation Control System, as shown on the drawings and described herein.

B. All labor, material, equipment, and software necessary to meet the functional intent of the Building Automation Control System as specified herein and as shown on the drawings shall be included.

C. Drawings are diagrammatic only. Equipment and labor not specifically referred to herein, or on the plans, that are required to meet the functional intent of the Building Automation Control System, shall be provided without additional cost to Sac City Unified School District.

D. Equipment furnished by Electrical and/or Mechanical Contractor that is normally wired before installation shall be furnished completely wired. Wiring normally performed in field shall be furnished and installed by the Building Automation Control System contractor.

E. Control equipment having electrical connections only, which are furnished under this work, shall be installed and connected by the Building Automation Control System contractor. Electrical devices requiring wet side piping connections shall be installed by the Mechanical Contractor.

F. Clearly identify and label equipment and controls, such as starters, switches, relays, as to function and position with permanently engraved plastic nameplates.

G. Wiring of control equipment in accordance with wiring diagrams and functional operation of the control system shall be the responsibility of the Building Automation Control System contractor.

H. Final Adjustment of Equipment: After completion of installation, adjust temperature sensors, control valves, actuators, motors, and similar equipment provided under the scope of work of this section. Cooperate with the air balance contractor as required.

I. Perform final adjustment by specially trained personnel in direct employ by the manufacturer of the primary Building Automation Control System.

J. Connect control valves with threaded connections with sufficient unions to permit valves to be readily removed from their installed locations for servicing, without disturbing adjacent piping. In no case shall this be less than three unions for three-way valves and one union for two-way valves.

K. Wiring and raceways included with the BACS scope of works includes but is not limited to the following:

   1. Power wiring for all controllers, sensors, relays and other equipment shall be taken from the local HVAC controls panels except equipment provided with dedicated supplies provided by Division 16.
   2. Controls wiring shall be routed from the local HVAC controls panels.
   3. Conduit shall be used for the following:
      a. All exposed and concealed low voltage wiring in all areas below 8 feet above floor level.
      b. All mechanical and equipment rooms, exterior locations and any other areas where physical protection and/or access is required as defined elsewhere in the contract documents.
      c. All in-wall drops to equipment monitoring and/or control points including but not limited to medical equipment, kitchen service equipment, elevator sump and other moisture sensors, water flow meters, equipment mounted alarms, etc.
      d. All areas where specifically indicated on the Drawings.
   4. J-Hooks and or designated LV raceway shall be used for the following:
      a. All low voltage wiring above 8 feet above floor level in open and accessible areas where conduit is not required, to cable trays or other conduits.

b. All areas where specifically indicated on the Drawings.

5. Conduit and J-Hook materials and installation requirements shall comply with the applicable sections of Division 16 unless specifically indicated otherwise on the Drawings.

3.2 WARRANTY:

A. The Building Automation Control System contractor shall provide a one-year warranty covering the Building Automation Control System, and all associated components installed by the Building Automation Control System contractor. Any manufacturing or installation defects arising during this warranty period shall be corrected without cost to the Owner. The Building Automation Control System contractor shall respond to the job site within a four (4) hour period for any emergency relating to the control system and associated components installed by the Building Automation Control System contractor. Warranty period shall commence after all operator instruction is completed and the entire system has been accepted by the Owner.

3.3 CARE AND CLEANING:

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Owner's Representative. At completion, carefully clean and adjust equipment, fixtures, and trim installed as part of this work. Leave systems and equipment in satisfactory operating condition.

3.4 OPERATION TEST/SYSTEM COMMISSIONING:

A. Each piece of equipment shall be tested by the Building Automation Control System contractor to show that it will operate in accordance with designed requirements, and provide written documentation of this test. Control system commissioning shall consist of a point per point conformation and system operational demonstration conducted jointly by the Building Automation Control System contractor and the University's Representative.

B. The mechanical contractor and BACS contractor/vendor will conduct two levels of Quality Assurance to verify that the required installation and performance of the Building Automation Control System as been met.

1. Static Commissioning:

a. A point to point examination and documentation of the successful installation of the BACS system and its components in its entirety.

b. The start up of all HVAC equipment and associated systems will not commence until this work has been completed and the documentation received by the Owner.

2. Dynamic Commissioning:

a. A point by point demonstration and documentation of the successful performance of the BACS system and its components in its entirety.

b. The verification demonstrations of all HVAC equipment and associated systems will not commence until this work has been completed and the documentation received by the Owner.

C. All new controller programming shall be backed up into the districts existing database.

D. As part of the operational test's the controls contractor shall demonstrate integration of new controls system into the existing server and BACS.

E. In General the Commissioning process will comprise the following:
   1. Review of points list and documentation.
   2. Installation compliance with project plans and specifications.
   3. Point-to-point check.
   4. Control devices calibration and operation.
   5. System programming and documentation.
   6. System endurance test.
   7. Control loop trends.
   8. Reports and alarms.
   9. Analog input calibration.
   10. Analog output check and spring ranges.
   11. Digital input range set points.
   12. Digital output in autolog.
   13. Point by point performance verification.
   14. O & M training and documentation.
   15. Opposite season verification and documentation.
   16. Review and document system architecture.

F. Prior to job closing, the controls contractor must provide and present drawings showing the physical location of the new Field Control bus routing around the campus. This will be reviewed by district HVAC personnel.

3.5 OPERATOR INSTRUCTION:

A. During system commissioning and at such time acceptable performance of the Building Automation Control System hardware and software has been established, the Control Contractor shall schedule with the Owner's Representative and provide eight (8) hours of on site, or off site, operator instruction to the Owner's operating personnel. Operator instruction during normal working hours shall be performed by a competent representative familiar with the systems hardware, software, and accessories

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Split system heat pump units.
2. Air cooled condensing units.
3. Cooling coils.
4. Refrigerant piping and fittings.
5. Dampers.
6. Ductwork.
7. Insulation.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 23 00 50, Basic HVAC Materials and Methods.

C. Section 23 05 93, Testing, Adjusting, and Balancing for HVAC.

D. Section 23 09 23, Direct Digital Control (DDC) System for HVAC.

1.3 ACTION SUBMITTALS

A. For additional requirements, refer to Section 23 00 50, Basic HVAC Materials and Methods.

B. Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, dimensions, weight, corner or mounting point weights, furnished specialties and accessories; and installation and start-up instructions. Product data shall include applicable product listings and standards. Refer to Section 23 00 50, Basic HVAC Material and Methods for additional requirements.

C. Engineering Data: Submit fan curves and sound power level data for each fan unit. Data shall be at the scheduled capacity. Data shall include the name of the rating agency or independent laboratory.

1.4 INFORMATIONAL SUBMITTALS

A. For additional requirements, refer to Section 23 00 50, Basic HVAC Materials and Methods.

B. Record of pre-installation meeting.

C. Coordinated Layouts: Submit coordinated layouts. For requirements refer to article, Coordinated Layouts, in this Section.

1.5 CLOSEOUT SUBMITTALS

A. For additional requirements, refer to Section 23 00 50, Basic HVAC Materials and Methods.

B. Maintenance Data: Submit maintenance data and parts list for each piece of equipment, control, and accessory; including "trouble-shooting guide," in Operation and Maintenance Manual.

C. Record Drawings: Submit Record Drawings of installed ductwork, duct accessories, and outlets and inlets in accordance with requirements of Division 01.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.7 COORDINATED LAYOUT

A. Coordinated layouts are required to amplify, expand and coordinate the information contained in the Contract Documents.

B. Provide minimum 1/4 inch equals one foot scaled coordinated layout drawings showing plan and pertinent section or elevation views of piping, ductwork, equipment, accessories, and electrical systems. Drawings shall be reproducible and work of each trade represented shall be fully coordinated with structure, other disciplines, and finished surfaces. Drawings shall be presented on a single size sheet. Coordinated layout drawings shall have title block, key plan, north arrow and sufficient grid lines to provide cross-reference to design Drawings.

1. Provide a stamp or title block on each drawing with locations for signatures from all contractors involved, including but not limited to the General, HVAC, Plumbing, Fire Protection, and Electrical contractors. Include statement for signature that the contractor has reviewed the coordinated layout drawings in detail and has coordinated the work of his trade.
2. Show on drawings the intended elevation of all ductwork in accordance with the following example:

   B.O.D. = 9'-0"
   OFFSET UP 6"
   B.O.D. = 9'-6"

3. Highlight, encircle or otherwise indicate deviations from the Contract Documents on the coordinated layouts. Architect will not be responsible for identifying deviations from the original Contract Documents.

C. Since scale of contract drawings is small and all offsets and fittings are not shown, Contractor shall make allowances in bid for additional coordination time, detailing, fittings, offsets, hangers and the like to achieve a fully coordinated installation. If changes in duct size are required, equivalent area shall be maintained and the aspect ratio shall not be in excess of 2 to 1 unless approved by the engineer. Drawings shall be submitted for review prior to fabrication and installation. Drawings may be submitted in packages representing at least one quarter of the building ductwork.

D. Check routing on all ductwork before fabricating. Report any discrepancies to Architect. No extra cost will be allowed for failure to conform to above.

1.8 QUALITY ASSURANCE

A. Design Criteria:

1. All equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture. All gas-fired equipment shall be UL, ETL or CSA listed.
2. Supply all equipment and accessories in accordance with requirements of applicable national, state and local codes.
3. All items of a given type shall be products of the same manufacturer.
4. Scheduled equipment performance is minimum capacity required.
5. Scheduled electrical capacity shall be considered as maximum available.
6. Scheduled gas BTU input shall be considered as maximum available.

1.9 FIELD CONDITIONS

A. Interruption of Existing Services: Do not interrupt services to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of services.
2. Do not interrupt services without Owner's written permission.

1.10 WARRANTY

1. Air Cooled Condensing Unit: Unit shall have 5-year limited compressor warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Insulation products, including insulation, insulation facings, jackets, adhesives, sealants and coatings shall not contain polybrominated diphenyl ethers (PBDEs) in penta, octa, or deca formulations in amounts greater than 0.1 percent (by mass).

2.2 SPLIT SYSTEM HEAT PUMPS

A. General: Furnish and install split system air-to-air heat pump system, with R410A refrigerant, and complete with automatic controls. Equipment shall be shipped factory assembled, wired, tested, and ready for field connections.

B. Quality Assurance:

1. Unit shall be ETL or UL listed and labeled.
2. Unit shall be manufactured in a facility registered to ISO 9001:2000.
3. Unit shall be rated in accordance with ARI standard 210.

C. Delivery, Storage and Handling: Follow manufacturer's recommendations.

D. Heating/Cooling System: The total certified heating/cooling capacity shall not be less than scheduled. The compressor power input shall not exceed that of the unit specified.

E. Indoor Section: Wall mounted, ceiling surface mounted, or ceiling recessed mounted, as indicated on Drawings.

1. Cabinet:

a. Wall mounted: Molded white high strength plastic.

1) Provide wall mounted unit with factory mounting plate.

2. Fans: Double inlet, forward curved, statically and dynamically balanced.
3. Fan Motor: Direct drive, permanently lubricated, with two or 4 speed operation for unit size scheduled on Drawings.

a. For single-phase fan motors sized larger than 1/12 hp and smaller than 1 hp, refer to Article, Electric Motors, in Section 23 00 50, Basic HVAC Materials and Methods.

4. Air Outlet: With motorized horizontal and vertical vanes.

a. Wall and ceiling surface mounted units: Horizontal vane shall close air outlet upon unit shut-down.

5. Evaporator Coil: Aluminum fins mechanically bonded to copper tubes. Coils shall be pressure leak tested.
6. Insulation: Interior surfaces exposed to the airstream shall be fully insulated.

F. Outdoor Section:

1. Casing: Galvanized steel plate, powder coated with acrylic or polyester.
2. Condenser Fan Grille: ABS plastic.
3. Fan and fan motor: Direct drive, totally enclosed, propeller type, permanently lubricated, horizontal discharge.
4. Compressor: Variable speed rotary type, with crankcase heater and accumulator. Compressor shall be capable of operating at 0 degrees F. Compressor mounted on vibration isolator pads.
5. Coil: Aluminum fins mechanically bonded to copper tubes. Coils shall be pressure leak tested. Provide coil with integral metal guard.

G. Controls: Hard wired, microprocessor based, wall mounted controller with LCD display shall provide the following functions, as a minimum:

1. 7-day programmable timer.
2. Test and check functions.
3. Diagnostic functions.
4. Vane position control.
5. Fan speed adjustment.
6. Temperature adjustment.
7. Automatic restart.
8. Mode selection, including heat/auto/cool/dry/fan.
    a. Provide lockable enclosure for wall mounted controller.

H. Safeties: Shall include the following, as a minimum:

1. Five minute compressor anti-recycle timer.
2. High pressure protection.
3. Current and temperature sensing motor overload protection.

I. Filters: Provide manufacturers washable filters for indoor unit. Provide sufficient filters for four complete changes for each unit.

J. Service Access: All components, wiring, and inspection areas shall be completely accessible through removable panels.

K. Refrigerant Piping:

1. Provide factory pre-charged and sealed line set piping, length to suit the location of equipment. Tubing sizes shall be in accordance with manufacturers written instructions.
2. Provide refrigeration piping in accordance with Article, Refrigerant Piping, in this Section.

L. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

1. Mitsubishi Electric Corporation.
2. Carrier Corporation.
3. Sanyo Electric Co., Ltd.

M. Owner Training: Manufacturer shall provide one on-site 2-hour training session for Owners' maintenance personnel.

2.3 AIR COOLED CONDENSING UNIT

A. Provide outdoor-mounted, factory assembled, single piece, air-cooled, split-system air conditioner unit suitable for ground or rooftop installation, rated in accordance with ARI Standard 210, and UL or ETL listed and labeled. Provide refrigerant charge R-410A, all internal wiring, piping, controls, compressor, and special features required prior to field start-up. Design unit to conform to the following:

1. ANSI/ASHRAE latest edition.
2. NEC latest edition.
3. Unit cabinet to be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 500-hr salt spray test.
4. Unit shall be constructed in accordance with UL standards.

B. Unit shall be certified for capacity and efficiency, and listed in the latest ARI directory.

C. Unit shall be manufactured in a facility registered to ISO 9001:2000.

D. Unit shall be Energy Star Qualified.

E. Provide unit with 5 year limited parts warranty.

F. Cabinet:

1. Unit cabinet constructed of galvanized steel, bonderized, and coated with powder coat paint.

G. Fans:

1. Direct-drive propeller type condenser fan, discharging air vertically.
2. Totally enclosed condenser fan motors, 1-phase type with Class B insulation and permanently lubricated bearings, and corrosion resistant shafts.
3. Condenser fan openings equipped with PVC-coated steel wire safety guards.
4. Statically and dynamically balanced fan blades.

H. Compressor:

1. Hermetically sealed compressor mounted on rubber vibration isolators.
2. Compressor with sound insulator.

I. Refrigeration Components:

1. Refrigerant circuit to include liquid and vapor line shut-off valves with sweat connections.
2. System charge of R-410A refrigerant and compressor oil.

3. Unit to be equipped with factory-supplied high-pressure switch, low pressure switch, and filter drier.
4. Provide unit with manufacturer's refrigerant line set.
5. Provide refrigeration piping in accordance with Article, Refrigerant Piping, in this Section.

J. Condenser Coil:

1. Air-cooled condenser coil constructed of aluminum fins mechanically bonded to copper tubes.
2. Coils shall be leak and pressure tested.

K. Electrical Requirements:

1. Unit shall have single point power connection.
2. Provide unit with 24V control circuit.

L. Operating Characteristics:

1. Unit shall be capable of starting and running a 115 degrees F ambient outdoor temperature per maximum load criteria of ARI Standard 210.
2. Compressor with standard controls shall be capable of operation down to 55 degrees F ambient outdoor temperature.

M. Provide the following additional components and features:

1. Provide evaporator freeze thermostat, winter start control, compressor start assist capacitor and relay, low ambient controller, and ball bearing fan motor.
2. Provide expanded metal coil guard for all sides of the air-cooled condensing unit. Coil guard shall be as manufactured by MicroMetl, Can-Fab, or equal.

N. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

1. Carrier Corporation.
2. Trane Inc.

O. Owner Training: Manufacturer shall provide one on-site 1-hour training sessions for Owners' maintenance personnel.

2.4 COOLING COIL

A. Provide direct expansion encased cooling coil.

1. Install encased coil to operate properly in vertical or horizontal position as required. Construct coil with aluminum plate fins mechanically bonded in non-ferrous tubing with all joints brazed ultrasonically. Coil shall have factory-installed refrigerant metering device, refrigerant line fittings which permit mechanical connections, and condensate pan with primary and auxiliary drain connections.

2. Construct casings of galvanneal steel, bonderize, insulate, and finish with baked enamel.

2.5 REFRIGERATION PIPE AND FITTINGS

A. Refrigeration gas and liquid piping shall be type ACR hard drawn copper tubing, cleaned and capped in accordance with ASTM B280, with wrought copper fittings. All joints shall be brazed with Sil-fos under nitrogen purge. Relief valve discharge piping shall be full size of relief discharge port.

1. Manufactured, pre-charged and pre-insulated refrigerant line-set refrigerant piping may be utilized at Contractor's discretion.

a. VRF Systems: Use of manufactured, pre-charged and pre-insulated refrigerant line-set refrigerant piping between outdoor condensing units and indoor heat recovery controllers, or distribution headers and tees is not allowed. When system manufacturer's installation instructions allow use of refrigerant line-set piping between indoor heat recovery controllers, or distribution headers and tees, and air terminal devices, follow instructions for allowable pipe size range and support to avoid forming traps in the piping.

B. Refrigeration Piping Specialties: Furnish and install Superior, Sporlan, Alco, Henry, or equal, stop valves, solenoid valves, adjustable thermal expansion valves, sight glass, flexible connection, charging valve, and drier with valve bypass in the liquid lines and Superior DFN shell and cartridge suction line filter sized 2-1/2 times tonnage.

1. Install only those refrigeration piping specialties recommended by manufacturer of specific installed equipment.

2.6 REFRIGERANT ACCESS VALVE LOCKING CAPS

A. Each refrigerant circuit access valve located outside buildings, including valves located on roofs, shall be provided with a locking cap. Caps shall be of metal construction, with threaded brass inserts. Caps shall be color-coded according to ASHRAE standards for R22 and R410A refrigerant gasses, universal color for other refrigerant gasses. Caps shall be removable only with cap manufacturer's handheld tool.

1. Provide minimum of two (2) cap removal tools for every ten (10) air conditioning units or other systems containing refrigerant installed under this Project.

2.7 DAMPERS

A. Manual Air and Balance Dampers: Provide dampers of single blade type or multi-blade type constructed in accordance with SMACNA, "HVAC Duct Construction Standards," except as noted herein.

2.8 DUCTWORK

A. Construct and install sheet metal ductwork in accordance with the California Mechanical Code for 2 inches static pressure for supply air, and 2 inches minimum for return and exhaust air unless otherwise noted on Drawings.

1. Where not in conflict with the California Mechanical Code, construct and install all sheet metal ductwork in accordance with SMACNA HVAC Duct Construction Standards (Metal and Flexible). Where applicable for HVAC work, construct and install sheet metal work in accordance with SMACNA Architectural Sheet Metal Manual.
2. Provide variations in duct size, and additional duct fittings as required to clear obstructions and maintain clearances as approved by the Architect at no extra cost to the Owner.
3. Gauges, joints and bracing shall be in accordance with the California Mechanical Code.
4. Provide beading or cross breaking for all ductwork inside building. Provide cross breaking for ductwork exposed to weather.
5. At the contractor's option, ductwork may be fabricated using the Ductmate, Nexus, Quickduct, Transverse Duct Connection (TDC), Pyramid-Loc duct connection systems, or equal. Fabricate in strict conformance with manufacturer's written installation instructions and in accordance with California Mechanical Code.

    a. Seal flanged ends with pressure sensitive high density, closed cell neoprene or polyethylene tape gasket, Thermo 440, or equal.
    b. Provide metal clips for duct connections, except at breakaway connections for fire dampers and fire smoke dampers. Provide corner clips at each corner of duct, through bolted, at all locations except at breakaway connections for fire dampers and fire smoke dampers. Where used on locations exposed to weather, provide continuous metal clip at top and sides of duct, with 1 inch overhang for top side.

B. Design and installation standards:

1. SMACNA Compliance: Comply with applicable portions of Sheet Metal and Air Conditioning Contractor's National Association (SMACNA) for all work in this section.
2. NFPA Compliance: Comply with ANSI/NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems," and ANSI/NFPA 90B, "Standard for the Installation of Warm Air Heating and Air Conditioning Systems."
3. California Mechanical Code.

C. Duct sizes indicated are external sizes.

D. Galvanized Sheet Steel: Lock-forming quality, ASTM A924 and ASTM A653, Coating Designation G 90. Provide mill phosphatized finish for exposed surfaces of ducts exposed to view.

1. Provide mill certification for galvanized material at request of the Project Inspector.

E. Duct Sealants:

1. Sealant shall have a VOC content of 250 g/L or less.
2. Sealant shall comply with testing and product requirements of South Coast Air Quality Management District, Rule 1168.
3. Provide one part, non-sag, synthetic latex sealant, formulated with a minimum of 68 percent solids. Sealant shall comply with ASTM E84, Surface Burning Characteristics.

    a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

        1) Design Polymerics, model DP1010.
        2) Polymer Adhesive Sealant Systems Inc, model Airseal #11.
        3) McGill Airseal, LLC.

F. Duct Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, straps, trim, and angles for support of ductwork.

G. Rectangular Duct Fabrication:

1. Shop fabricate ductwork of gauges and reinforcement complying with the more stringent of the following standards, except as noted herein.

    a. SMACNA HVAC Duct Construction Standards
    b. California Mechanical Code

2. Fabricate ducts for 2 inch pressure class with minimum duct gauges and reinforcement as follows, except as otherwise noted:

Table A

Duct Dimension	Minimum Gauge	Joint Reinforcement Per CMC
Through 12"	26	Not Required
13" through 18"	24	Not Required
19" through 30"	24	C/4
31" through 42"	22	E/4
43" through 54"	22	F/2
55" through 60"	20	G/4
61" through 84"	20	I/2

85" through 96"	20	J/2
Over 96"	18	K/2

3. Fabricate duct fittings to match adjoining ducts and to comply with duct requirements as applicable to fittings. Except as otherwise indicated, fabricate elbows with center-line radius equal to 1.5 times associated duct width. Fabricate to include single thickness turning vane in elbows where space does not permit the above radius or where square elbows are shown. Limit angular tapers to 30 degrees for contracting tapers and 20 degrees for expanding tapers. Turning vanes shall be E-Z Rail II, Durodyne, or equal.
4. Fabricate round supply connections at rectangular, plenum type fittings using spin-in type fittings, complete with extractor and volume control damper. Refer to Paragraph “DAMPERS” for damper requirements.
5. Provide drive slip or equivalent flat seams for ducts exposed in the conditioned space or where necessary due to space limitations. On ducts with flat seams, provide standard reinforcing on inside of duct. Duct connection to outlet on exposed duct shall be full size of outer perimeter of outlet flange.
6. Ducts exposed in the conditioned space shall be free of dents and blemishes and be mounted tight against adjacent surface with flat hangers. Remove all fabrication labels from ductwork.
7. Provide 20 gauge minimum for ductwork exposed within occupied spaces.

H. Duct Access Doors:

1. Duct Access: Provide hinged access door in rectangular ducts for access to fire dampers, control equipment, etc. Access door size shall be duct diameter wide by duct diameter high for all ducts under 24 inches. Ducts over 24 inches in diameter shall have 24-inch by 18-inch access doors. Minimum size access doors shall be 6 inches by 6 inches.
2. Provide hinged style access doors for round ductwork, NCA Manufacturing, Inc., Model AD-RD-87, Pottorff Series 60, or equal. Access doors shall be 16 gauge galvanized steel with continuous piano hinge. Locks shall be plated steel strike and catch. Provide 1" x 3/8" Polyethylene "Perma Stik" gasket all around door.

3. Duct Access Panels:

   a. Provide duct access panel assembly of the same material and gauge used for the duct. Duct access panels shall conform to the following:

      1) Fasteners: Black steel or stainless steel to match material used for the duct. Panel fasteners shall not penetrate duct wall.
      2) Gasket: Comply with NFPA 96, grease-tight, high temperature ceramic fiber, rated for minimum 1500 °F.

2.9 PIPE JOINING MATERIALS

A. Refer to Division 22 and 23 piping sections for special joining materials not listed below.

B. Brazing Filler Metals:

1. General Duty: AWS A5.8, BCup-5 Series, copper-phosphorus unless otherwise indicated. Sil-Fos 15, or equal.
2. Refrigerant Piping:

    a. Joining copper to copper: AWS A5.8, BCup-5 Series, copper-phosphorus unless otherwise indicated. Sil-Fos 15, or equal.
    b. Joining copper to bronze or steel: AWS A5.8, Bag-1, silver alloy unless otherwise indicated.

2.10 INSULATION MATERIALS

A. General:

1. Insulation products, including insulation, insulation facings, jackets, adhesives, sealants and coatings shall not contain polybrominated diphenyl ethers (PBDEs) in penta, octa, or deca formulations in amounts greater than 0.1 percent (by mass).
2. Products shall not contain asbestos, lead, mercury, or mercury compounds.
3. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
4. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
5. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
6. Test insulation, jackets and lap-seal adhesives as a composite product and confirm flame spread of not more than 25 and a smoke developed rating of not more than 50 when tested in accordance with UL723 or ASTM E84.
7. Adhesives and sealants shall comply with testing and product requirements of South Coast Air Quality Management District, Rule 1168.

B. Insulation Materials:

1. Mineral-Fiber, Preformed Pipe Insulation:

    a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

        1) Johns Manville; a Berkshire Hathaway company.
        2) Knauf Insulation.
        3) Manson Insulation Inc.
        4) Owens Corning.

    b. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ-SSL.

C. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

    a. Design Polymerics.
    b. Foster Brand; H. B. Fuller Construction Products.
    c. Knauf Insulation.

2. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
3. Service Temperature Range: 0 to plus 180 deg F.
4. Color: White.

D. Vapor-Barrier Mastic: Solvent based; suitable for outdoor use on below-ambient services.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

    a. Design Polymerics.
    b. Childers Brand; H. B. Fuller Construction Products.
    c. Foster Brand; H. B. Fuller Construction Products.

2. Water-Vapor Permeance: Comply with ASTM E96/E96M or ASTM F1249.
3. Service Temperature Range: Minus 50 to plus 220 deg F.
4. Color: White.

E. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include the following, or equal:

    a. Design Polymerics.
    b. Childers Brand; H. B. Fuller Construction Products.
    c. Foster Brand; H. B. Fuller Construction Products.
    d. Knauf Insulation.

2. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
3. Service Temperature Range: 0 to plus 180 deg F.
4. Color: White.

2.11 TEMPERATURE CONTROL SYSTEM

A. Refer to Section 23 09 23, Direct Digital Control System for HVAC.

PART 3 - EXECUTION

3.1 ROOF MOUNTED EQUIPMENT INSTALLATION

A. Mount and anchor equipment in strict compliance with Drawings details. Alternate anchorage methods will not be considered for roof mounted equipment.

B. Examine rough-in for roof mounted equipment to verify actual locations of piping and duct connections prior to final equipment installation.

C. Verify that piping to be installed adjacent to roof mounted equipment allows service and maintenance.

3.2 SPLIT SYSTEM HEAT PUMP INSTALLATION

A. General:

1. Install units level and plumb.
2. Install evaporator-fan components as detailed on Drawings.
3. Install ground or roof- mounted condensing units as detailed on Drawings.
4. Install seismic restraints as required by applicable codes. Refer to Article, Submittals, in Section 23 00 50, Basic HVAC Materials and Methods, for design requirements for seismic restraints.
5. Install and connect refrigerant piping as detailed in unit manufacturers' literature. Install piping to allow access to unit.
6. Install cooling coil condensate primary drain pan piping, and overflow, if provided, and run to nearest code-compliant receptacle, or as indicated on Drawings. Install secondary drain pan for units installed over permanent and suspended-tile ceilings. Install secondary drain pan piping and terminate 1/2 inch below ceiling, with escutcheon, in a readily visible location or as shown on Drawings.
7. Install air filters at each indoor unit. Install washable, permanent filters at indoor units designed to accept washable, permanent filters. Refer to Drawings schedule, and Article, Air Filters, in this Section, for filter requirements for ducted, above-ceiling units incorporating mixing boxes.
8. Duct Connections: Duct installation requirements are specified in Article, Ductwork, in this Section. Drawings indicate the general arrangement of ducts. Connect supply and return ducts to split-system air-conditioning units with flexible duct connectors. Flexible duct connectors are specified in Article, Ductwork, in this Section.

3.3 REFRIGERANT PIPING INSTALLATION

A. General:

1. Install refrigerant piping according to ASHRAE 15. Install and connect refrigerant piping as detailed in unit manufacturers' literature. Install piping to allow access to unit.

2. Install piping straight and free of kinks, restrictions or traps.
3. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
4. Slope horizontal suction piping 1 inch/10 feet towards compressor.
5. Install fittings for changes in direction and branch connections.
6. Piping under raised floors shall be kept 6 inches minimum above ground; excavate as necessary.
7. Install locking caps on refrigerant access valves located outside building, including valves located on roofs.
8. Insulate refrigerant piping, including liquid and hot gas pipes when required by system manufacturer, and including headers, branches, and other components as detailed in unit manufacturers' literature.

B. Factory Pre-charged and sealed line set piping:

1. Keep the entire system clean and dry during installation.
2. All tubing shall be evacuated and sealed at the factory. The seal must not be broken until ready for assembly.
3. If there is any evidence of dust, moisture, or corrosion, the tubing must be cleaned out by drawing a swab soaked with methyl alcohol through the tubing as many times as necessary to thoroughly clean the tubing.
4. Where line set piping is exposed mounted at grade, on walls, and on roof, enclose in 16 gage galvanized steel enclosure.

    a. In other locations, enclose line set piping in iron or steel piping and fittings or in EMT conduit.

C. Field Assembled Refrigerant Piping:

1. Select system components with pressure rating equal to or greater than system operating pressure.
2. Where subject to mechanical injury, enclose refrigerant piping in EMT conduit.
3. Where field assembled refrigerant piping is exposed mounted at grade, on walls, and on roof, enclose in 16 gage galvanized steel enclosure.
4. When brazing, remove solenoid valve coils and sight glasses, also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.

3.4 DAMPER INSTALLATION

A. All dampers automatically controlled by damper motors are specified under "Temperature Control System" except those specified with items of equipment.

B. Provide opposed blade manual air dampers at each branch duct connection and at locations indicated on the drawings and where necessary to control air flow for balancing system. Provide an opposed blade balancing damper in each zone supply duct. Provide an access panel or Ventlok flush type damper regulator on ceiling or wall for each concealed damper.

C. Provide 18 inch x 12 inch minimum hinged access doors in ductwork and furring for easy access to each fire damper; insulated access doors in insulated ducts. Label access doors with 1/2 inch high red letters.

1. Provide Ventlok Series 100, Durodyne, or equal access doors with hardware for convenient access to all automatic dampers and other components of the system, insulated type in insulated ducts. Provide Ventlok #202 for light duty up to 2 inch thick doors, #260 heavy-duty up to 2 inch thick doors and #310 heavy-duty for greater than 2 inch thick doors. Provide #260 hinges on all hinged and personnel access doors; include gasketing.

3.5 DUCTWORK INSTALLATION

A. General:

1. Assemble and install ductwork in accordance with recognized industry practices which will achieve air tight and noiseless (no objectionable noise) systems capable of performing each indicated service. Install each run with minimum of joints. Align ductwork accurately at connections within 1/8 inch misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers, and anchors of type which will hold ducts true to shape and to prevent buckling. Where possible, install ductwork to clear construction by 1/4 inch minimum, except at air inlets and outlets. Where ductwork will not clear construction, secure duct firmly to eliminate noise in the system.
2. Duct Joints: Install duct sealers, pop rivets or sheet metal screws at each fitting and joint. Duct sealers shall be fire retardant. Sheet metal screws for joints shall be minimum #10 size galvanized.
3. Where ductwork is left exposed within a room, the same shall be run true to plumb, horizontal, or intended planes. Where possible, uniform margins are to be maintained between parallel lines and/or adjacent wall, floor, or ceiling surfaces.
4. Horizontal runs of ductwork suspended from ceilings shall provide for a maximum headroom clearance. The clearance shall not be less than 6'-6" without written approval from the Architect.
5. Provide sheet metal angle frame at all duct penetrations to wall, floor, roof, or ceiling.
6. Paint inside of ducts, visible through grille, dull black.
7. Where ductwork is installed in finished areas of buildings that do not have ceilings, paint ductwork, support hangers, and air inlets and outlets to match adjacent architectural surfaces, or as directed by Architect.
8. At the time of rough installation, or during storage on the construction site and until final startup of the heating and cooling equipment, duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal, or other methods acceptable to the enforcing agency.

B. Firestopping:

1. Pack the annular space between duct openings and ducts penetrating floors and walls with UL listed fire stop, and sealed at the ends. All pipe penetrations shall be UL listed, Hilti, 3M Pro-Set, or equal.

a. Install fire caulking behind mechanical services installed within fire rated walls, to maintain continuous rating of wall construction.

2. Firestopping systems to be installed in strict accordance with manufacturer's instructions.
3. Alternate firestopping systems are acceptable if approved equal. However, any deviation from the above specification requires the Contractor to be responsible for determining the suitability of the proposed products and their intended use, and the Contractor shall assume all risks and liabilities whatsoever in connection therewith.

C. Upper connection of support to wood structure shall be with wood screws or lag screws in shear fastened in the upper one half of the wood structural member. Fasteners shall conform to the following schedule:

For ducts with P/2=30"	#10 x 1-1/2" wood screw
For ducts with P/2=72"	1/4"x 1-1/2" lag screw
For ducts with P/2 over 73"	3/8"x 1-1/2" lag screw

D. Upper connection in tension to wood shall not be used unless absolutely necessary. Where deemed necessary the contractor shall submit calculations to show the size fastener and penetration required to support loads in tension from wood in accordance with the following schedule:

For ducts with P/2=30"	260 pounds per hanger
For ducts with P/2=72"	320 pounds per hanger
For ducts with P/2=96"	460 pounds per hanger
For duct with P/2 larger than 120"	NOT ALLOWED

E. Install concrete inserts for support of ductwork in coordination with formwork as required to avoid delays in work.

F. Where ducts pass through interior partitions and exterior walls, conceal space between construction opening and duct or duct plus insulation with sheet metal flanges of same gauge as duct. Overlap opening on four sides by at least 1-1/2 inches.

G. Support ductwork in manner complying with SMACNA "HVAC Duct Construction Standards," hangers and supports sections. Where special hanging of ductwork is detailed or shown on Drawings, Drawings shall be followed. Angles shall be attached to overhead construction in a manner so as to allow a minimum of 2 inches of movement in all directions with no bending or sagging of the angle.

1. Except where modified in individual paragraphs of this Section, provide hanger support with minimum 18 gauge straps, 1 inch wide. Fold duct strap over at bottom of duct.

2. Install duct supports to rectangular ducts with sheet metal screws. Provide one screw at top of duct and one screw into strap at bottom of duct.

3.6 DUCTWORK SEALING AND LEAK TESTING

A. All ductwork shall receive a Class A seal.

B. Seal airtight all joints and seams, including standing seams and manufactured joints and seams, of all supply, return and exhaust ducts except those exposed in conditioned space.

C. Leakage Classes:

Pressure Class	Leakage Class	
	Round Duct	Rectangular Duct
2"W.G. or less	8	16
4"W.G. or greater	2	4

D. All duct systems (supply, return, outside air intake, and exhaust), except those identified on compliance forms on Drawings as requiring Acceptance Testing per the requirements of the California Energy Code, shall be tested in accordance with the requirements of SMACNA “HVAC Air Duct Leakage Test Manual.” Test pressure shall be equal to the pressure class of the duct. For additional duct leak testing requirements, refer to Section 230050, “Basic HVAC Materials and Methods,” Article, “Acceptance Requirements.”

3.7 PIPING INSTALLATION

A. General:

1. All piping shall be concealed unless shown or otherwise directed. Allow sufficient space for ceiling panel removal.
2. Installation of piping shall be made with appropriate fittings. Bending of piping will not be accepted.
3. Install piping to permit application of insulation and to allow valve servicing.
4. Where piping or conduit is left exposed within a room, the same shall be run true to plumb, horizontal, or intended planes. Where possible, uniform margins are to be maintained between parallel lines and/or adjacent wall, floor, or ceiling surfaces.
5. Horizontal runs of pipes and conduits suspended from ceilings shall provide for a maximum headroom clearance. The clearance shall not be less than 6'-6" without written approval from the Architect.
6. Close ends of pipe immediately after installation. Leave closure in place until removal is necessary for completion of installation.
7. Use reducing fittings; bushings shall not be allowed. Use eccentric reducing fittings wherever necessary to provide free drainage of lines and passage of air.
8. Verify final equipment and fixture locations for roughing-in.

9. Where piping is installed in walls within one inch of the face of stud, provide a 16 gauge sheet metal shield plate on the face of the stud. The shield plate shall extend a minimum of 1-1/2 inches beyond the outside diameter of the pipe.
10. Each piping system shall be thoroughly flushed and proved clean before connection to equipment.
11. Install exposed polished or enameled connections with special care showing no tool marks or threads at fittings.
12. Service Markers: Mark the location of each plugged or capped pipe with a 4 inch round by 30 inch long concrete marker, set flush with finish grade. Provide 2-1/2 inch diameter engraved brass plate as part of monument marker.
13. Pipe the discharge of each relief valve, air vent, backflow preventer, and similar device to floor sink or drain.

B. Sleeves:

1. Install Adjus-to-Crete, Pipeline Seal and Insulator, or equal, pipe sleeves of sufficient size to allow for free motion of pipe, 24 gauge galvanized steel. The space between pipe and sleeves through floor slabs on ground, through outside walls above or below grade, through roof, and other locations as directed shall be caulked with oakum and mastic and made watertight. The space between pipe and sleeve and between sleeve and slab or wall shall be sealed watertight.
2. At Contractor's option, Link-Seal, Metraflex Metraseal, or equal, casing seals may be used in lieu of caulking. Wrap pipes through slabs on grade with 1 inch thick fiberglass insulation to completely isolate the pipe from the concrete.

C. Floor, Wall, and Ceiling Plates:

1. Fit all pipes with or without insulation passing through walls, floors, or ceilings, and all hanger rods penetrating finished ceilings with chrome-plated or stainless escutcheon plates.

D. Firestopping:

1. Pack the annular space between pipe sleeves and pipes penetrating floors and walls with UL listed fire stop, and sealed at the ends. All pipe penetrations shall be UL listed, Hilti, 3M Pro-Set, or equal.

    a. Install fire caulking behind mechanical services installed within fire rated walls, to maintain continuous rating of wall construction.

2. Provide SpecSeal Systems UL fire rated sleeve/coupling penetrators for each pipe penetration or fixture opening passing through floors, walls, partitions or floor/ceiling assemblies. All Penetrators shall comply with UL Fire Resistance Directory (Latest Edition), and in accordance with CBC requirements.
3. Sleeve penetrators shall have a built in anchor ring for waterproofing and anchoring into concrete pours or use the special fit cored hole penetrator for cored holes.
4. Copper and steel piping shall have SpecSeal, or equal, plugs on both sides of the penetrator to reduce noise and to provide waterproofing.

5. Firestopping systems to be installed in strict accordance with manufacturer's instructions.
6. Alternate firestopping systems are acceptable if approved equal. However, any deviation from the above specification requires the Contractor to be responsible for determining the suitability of the proposed products and their intended use, and the Contractor shall assume all risks and liabilities whatsoever in connection therewith.

3.8 PIPE JOINTS AND CONNECTIONS

A. General:

1. Cutting: Cut pipe and tubing square, remove rough edges or burrs. Bevel plain ends of steel pipe.
2. Remove scale, slag, dirt and debris from inside and outside of pipe before assembly.
3. Boss or saddle type fittings or mechanically extracted tube joints will not be allowed.

B. Copper Pipe and Tubing: All joints shall be brazed according to ASME Section IX, Welding and Brazing Qualifications, except pneumatic control piping, and hydronic piping having grooved-end fittings and couplings.

C. Flexible Connections:

1. Furnish and install Thermo Tech., Inc. F/J/R, Metraflex, or equal, flexible couplings with limiter bolts on piping connections to all equipment mounted on anti-vibration bases, except fan coil units under 2000 cfm, on each connection to each base mounted pump and where shown. Couplings shall be suitable for pressure and type of service.
2. Flexible connections in refrigerant lines; Flexonic, Anaconda or equal, metal hose, full size.
3. Anchor piping securely on the system side of each flexible connection.

3.9 HANGER AND SUPPORT INSTALLATION

A. General: Support ductwork, equipment and piping so that it is firmly held in place by approved iron hangers and supports, and special hangers. Hanger and support components shall support weight of ductwork, equipment and pipe, fluid, and pipe insulation based on spacing between supports with minimum factor of safety of five based on ultimate strength of material used. Do not exceed manufacturer's load rating. Pipe attachments or hangers, of same size as pipe or tubing on which used, or nearest available. Rigidly fasten hose faucets, fixture stops, compressed air outlets, and similar items to the building construction. The Architect shall approve hanger material before installation. Where building structural members do not match piping and ductwork support spacing, provide “bridging” support members firmly attached to building structural members in a fashion approved by the structural engineer.

1. Materials, design, and type numbers for support of piping per Manufacturers' Standardization Society (MSS), Standard Practice (SP)-58.

    a. Provide copper-plated or felt-lined hangers for use on uninsulated copper tubing.

2. Materials and design for ductwork support shall be per SMACNA “HVAC Duct Construction Standards, Metal and Flexible.”

B. Hanger components shall be provided by one manufacturer: B-Line, Grinnell, Unistrut, Badger, or equal.

C. Riser clamps: B-line model B3373, or equal.

D. Rubber Neoprene Pipe Isolators:

1. Pipe isolators shall comprise an internal rubber or neoprene material that isolates pipe from hanger and structure. Install at all piping located in acoustical walls. Refer to Architectural Drawings for location of acoustical walls.
2. Isolation material shall be either a rubber or neoprene material that prevents contact between the pipe and the structure. The rubber shall have between a 45 to 55 durometer rating and a minimum thickness of 1/2 inch.
3. Manufacturers:

    a. Vertical runs: Acousto-Plumb or equal.
    b. Horizontal runs: B-Line, Vibraclamp; Acousto-Plumb or equal.

E. Pipe Hanger and Support Placement and Spacing:

1. Provide a support or hanger close to each change of direction of pipe either horizontal or vertical and as near as possible to concentrated loads.
2. Vertical piping hanger and support spacing: Provide riser clamps for piping, above each floor, in contact with the floor. Provide support at joints, branches, and horizontal offsets. Provide additional support for vertical piping, spaced at or within the following maximum limits:

Pipe Diameter	Steel Threaded or Welded (Note 3)	Copper Brazed or Soldered (Notes 3, 4)	CPVC & PVC (Note 2)
1/2 - 1”	12 ft.	Each Floor, Not to Exceed 10 ft.	Base and Each Floor (Note 1)
1-1/4 - 2”	12 ft.	Each Floor, Not to Exceed 10 ft.	Base and Each Floor (Note 1)
2-1/2 - 3”	12 ft.	Each Floor, Not to Exceed 10 ft.	Base and Each Floor (Note 1)

Over 4”	12 ft.	Each Floor, Not to Exceed 10 ft.	Base and Each Floor (Note 1)

a. Note 1: Provide mid-story guides.
b. Note 2: For PVC piping, provide for expansion every 30 feet per IAPMO installation standard. For CPVC piping, provide for expansion per IAPMO installation standard.
c. Note 3: Spacing of hangers and supports for piping assembled with mechanical joints shall be in accordance with standards acceptable to authorities having jurisdiction.
d. Note 4: Includes refrigerant piping, including vapor and hot gas pipes.

3. Horizontal piping, hanger and support spacing: Locate hangers and supports at each change of direction, within one foot of elbow, and spaced at or within following maximum limits:

Pipe Diameter	Steel Threaded or Welded (Note 2)	Copper Brazed or Soldered (Notes 2, 3)	CPVC & PVC (Note 1)
1/2 - 1"	6 ft.	5 ft.	3 ft.
1-1/4 - 2"	7 ft.	6 ft.	4 ft.
2-1/2 - 3"	10 ft.	10 ft.	4 ft.
Over 4"	10 ft.	10 ft.	4 ft.

a. Note 1: For PVC piping, provide for expansion every 30 feet per IAPMO installation standard. For CPVC piping, provide for expansion per IAPMO installation standard.
b. Note 2: Spacing of hangers and supports for piping assembled with mechanical joints shall be in accordance with standards acceptable to authorities having jurisdiction.
c. Note 3: Includes refrigerant piping, including vapor and hot gas pipes.

4. Suspended Piping:

a. Individually suspended piping: B-Line B3690 J-Hanger or B3100 Clevis, complete with threaded rod, or equal. All hangers on supply and return piping handling heating hot water or steam shall have a swing connector at point of support.

Pipe Size	Rod Size Diameter
2" and Smaller	3/8"

2-1/2" to 3-1/2"	1/2"
4" to 5"	5/8"
6"	3/4"

b. Suspend rods from concrete inserts with removable nuts where suspended from concrete decks. Power actuated inserts will not be allowed.
c. Trapeze Suspension: B-Line, or equal, 1-5/8 inch width channel in accordance with manufacturers' published load ratings. No deflection to exceed 1/180 of a span.
d. Trapeze Supporting Rods: Shall have a safety factor of five; securely anchor to building structure.
e. Pipe Clamps and Straps: B-Line B2000, B2400, or equal. Where used for seismic support systems, provide B-Line B2400 series, or equal, pipe straps.
f. Concrete Inserts: B-line B22-I continuous insert or B2500 spot insert. Do not use actuated fasteners for support of overhead piping unless approved by Architect.
g. Steel Connectors: Beam clamps with retainers.

F. Piping Support to Structure:
1. Steel Structure: Provide and install additional steel bracing as required to suit structure. Provide through bolts with length to suit requirements of the structural components. Burning or welding on any structural member may only be done if approved by the Architect.

G. Duct Hanger and Support Spacing: Conform to Requirements of CMC and SMACNA "HVAC Duct Construction Standards, Metal and Flexible."

H. Duct Support to Structure:

1. Upper connection of support to wood structure shall be with wood screws or lag screws in shear fastened in the upper one half of the wood structural member. Fasteners shall conform to the following schedule:

For ducts with P/2=30"	#10 x 1-1/2" wood screw
For ducts with P/2=72"	1/4"x 1-1/2" lag screw
For ducts with P/2 over 73"	3/8"x 1-1/2" lag screw

2. Upper connection in tension to wood shall not be used unless absolutely necessary. Where deemed necessary the contractor shall submit calculations to show the size fastener and penetration required to support loads in tension from wood in accordance with the following schedule:

For ducts with P/2=30"	260 pounds per hanger
For ducts with P/2=72"	320 pounds per hanger

For ducts with P/2=96"	460 pounds per hanger
For duct with P/2 larger than 120"	NOT ALLOWED

3. Install concrete inserts for support of ductwork in coordination with formwork as required to avoid delays in work.
4. Upper connection to manufactured truss construction must comply with truss manufacturers published requirements and Structural Engineers requirements.

3.10 INSULATION AND FIELD-APPLIED JACKET INSTALLATION

A. General:

1. The term "piping" used herein includes pipe, air separators, valves, strainers and fittings.
2. Clean thoroughly, test and have approved, all piping and equipment before installing insulation and/or covering.
3. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping, ductwork, and equipment.
4. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment as specified in insulation system schedules.
5. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
6. Install insulation with longitudinal seams at top and bottom of horizontal runs.
7. Install multiple layers of insulation with longitudinal and end seams staggered.
8. Keep insulation materials dry during application and finishing.
9. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
10. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
11. Install insulation in removable segments on equipment access doors, manholes, handholes, and other elements that require frequent removal for service and inspection. Bevel and seal insulation ends around manholes, handholes, ASME stamps, and nameplates.
12. For piping, ductwork, and equipment, with surface temperatures below ambient, apply mastic to open ends, joints, seams, breaks, and punctures in insulation.
13. Repair all damage to existing pipe, duct and equipment insulation whether or not caused during the work of this contract, to match existing adjacent insulation for thickness and finish, but conforming to flame spread and smoke ratings specified above.
14. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

    a. Install insulation continuously through hangers and around anchor attachments.

b. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
c. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
d. Cover inserts with jacket material matching adjacent insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

B. Piping Insulation Installation:

1. General:

a. Apply insulating cement to fittings, valves and strainers and trowel smooth to the thickness of adjacent covering. Cover with jacket to match piping. Extend covering on valves up to the bonnet. Leave strainer cleanout plugs accessible.
b. Provide removable insulation covers for items requiring periodic service or inspection.
c. Insulation shall be vapor tight before applying PVC jacket and fitting covers. Verify suitability with manufacturer of insulation.
d. Provide pre-formed PVC valve and fitting covers for indoor piping.
e. Provide factory-fabricated aluminum valve and fitting covers for outdoor piping.
f. Provide Calcium Silicate rigid insulation and sheet metal sleeve, 18 inch minimum length at each pipe hanger. Seal ends of insulation to make vapor tight with jacket.

2. Below-Ambient Services Including Chilled Water Supply and Return and Refrigerant Piping:

a. Insulate valves and irregular surfaces to match adjacent insulation and cover with two layers of woven glass fiber cloth saturated in Foster Sealfas 30-36, 3M, or equal, extending 3 inches over the adjoining pipe insulation. Finish with a coat of Foster Sealfas 30-36, 3M, or equal. The 3 inch wide SSL end laps furnished with the insulation shall be adhered over the end joints. Seal entire surface of insulation vapor tight, including joints and ends of PVC or aluminum fitting covers.
b. Variable refrigerant flow (VRF) heat pump systems: Insulation for VRF system refrigerant piping shall be installed according to VRF unit manufacturer’s instructions.

3. PVC Jacket Installation:

a. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications. Seal with manufacturer's recommended adhesive.

1) Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

4. Aluminum Jacket Installation:

a. Where insulated piping is exposed to the weather apply aluminum jacket secured with 1/2 inch stainless-steel bands on 12 inch centers. Install jacketing with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Cover fittings with glass cloth, two coats of Foster Sealfas 30-36, and factory-fabricated aluminum fitting covers, of same material, finish, and thickness as jacket. Insulation shall be vapor tight before applying metal jacket and fitting covers.

b. Do not install aluminum jackets on refrigerant flexible connectors to vibration isolated outdoor condensing units. Coat elastomeric insulation with insulation manufacturer’s recommended ultraviolet light protective coating.

3.11 TEMPERATURE CONTROL SYSTEM INSTALLATION

A. Provide thermostats where indicated on drawings. All wiring shall be in conduit. Provide all relays, transformers and the like to render the control system complete and fully operable. All control conduit to be rigid steel type.

3.12 EQUIPMENT START-UP

A. Initial start-up of the systems and pumps shall be under the direct supervision of the Contractor.

B. Equipment start-up shall not be performed until the piping systems have been flushed and treated and the initial water flow balance has been completed.

C. It shall be the responsibility of the Contractor to assemble and supervise a start-up team consisting of controls contractor, start-up technician, and test and balance contractor; all to work in concert to assure that the systems are started, balanced, and operate in accordance with the design.

D. After start-up is complete, instruct the Owner's personnel in the operation and maintenance of the systems. Obtain from the Owner's representative a signed memo certifying that instruction has been received.

E. For additional requirements, refer to article, Check, Test and Start Requirements, in Section 23 00 50, Basic HVAC Materials and Methods.

3.13 TESTING AND BALANCING

A. For testing and balancing requirements, refer to Section 23 05 93, Testing and Balancing for HVAC.

3.14 CLEANING AND PROTECTION

A. As each duct section is installed, clean interior of ductwork of dust and debris. Clean external surfaces of foreign substances that might cause corrosive deterioration of metal or where ductwork is to be painted.

B. Strip protective paper from stainless steel ductwork surfaces, and repair finish wherever it has been damaged.

C. Temporary Closure: At ends of ducts that are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering that will prevent entrance of dust and debris until connections are to be completed.

D. As each internally lined duct section is installed, check internal lining for small cuts, tears, or abrasions. Repair all damage with fire retardant adhesive.

3.15 EQUIPMENT MOUNTING

A. Mount and anchor equipment in strict compliance with Drawings details. Alternate anchorage methods will not be considered for roof mounted equipment.

3.16 INDOOR PIPING INSULATION SCHEDULE

A. Refrigerant Suction and Hot-Gas Piping, Cooling-Only Systems:

1. Suction and hot-gas piping smaller than 1-1/2 inches diameter:

    a. Flexible Elastomeric: 1/2 inch thick.
    b. Mineral-Fiber, Preformed Pipe: 1/2 inch thick.

2. Suction piping 1-1/2 inches diameter and larger:

    a. Flexible Elastomeric: 1 inch thick.
    b. Mineral-Fiber, Preformed Pipe: 1 inch thick.

B. Refrigerant Vapor and Liquid Piping, Heat Pump Systems:

1. Vapor piping for heat pump applications smaller than 1-1/2 inches diameter:

    a. Flexible Elastomeric: 1-1/2 inches thick.
    b. Mineral-Fiber, Preformed Pipe: 1-1/2 inches thick.

2. Vapor piping for heat pump applications 1-1/2 inches diameter and larger:

a. Flexible Elastomeric: 2 inches thick.
b. Mineral-Fiber, Preformed Pipe: 2 inches thick.

3. Liquid piping for heat pump applications smaller than 1 inch diameter:

a. Flexible Elastomeric: 1 inch thick.
b. Mineral-Fiber, Preformed Pipe: 1 inch thick.

4. Liquid piping for heat pump applications 1 inch diameter and larger:

a. Flexible Elastomeric: 1-1/2 inch thick.
b. Mineral-Fiber, Preformed Pipe: 1-1/2 inch thick.

3.17 OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE

A. Refrigerant Suction and Hot-Gas Piping, Cooling-Only Systems:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Flexible Elastomeric: 1 inch thick.
b. Mineral-Fiber, Preformed Pipe: 1 inch thick.

B. Refrigerant Vapor and Liquid Piping, Heat Pump Systems:

1. Vapor piping for heat pump applications smaller than 1-1/2 inches diameter:

a. Flexible Elastomeric: 1-1/2 inches thick.
b. Mineral-Fiber, Preformed Pipe: 1-1/2 inches thick.

2. Vapor piping for heat pump applications 1-1/2 inches diameter and larger:

a. Flexible Elastomeric: 2 inches thick.
b. Mineral-Fiber, Preformed Pipe: 2 inches thick.

3. Liquid piping for heat pump applications smaller than 1 inch diameter:

a. Flexible Elastomeric: 1 inch thick.
b. Mineral-Fiber, Preformed Pipe: 1 inch thick.

4. Liquid piping for heat pump applications 1 inch diameter and larger:

a. Flexible Elastomeric: 1-1/2 inch thick.
b. Mineral-Fiber, Preformed Pipe: 1-1/2 inch thick.

C. Refrigerant Flexible Connectors:

1. Flexible Elastomeric: Thicknesses as specified for rigid piping.

3.18 INDOOR FIELD-APPLIED PIPING JACKET SCHEDULE

A. Piping, concealed: None.

B. Piping, exposed: PVC, 20 mils thick.

3.19 OUTDOOR FIELD-APPLIED PIPING JACKET SCHEDULE

A. All Piping: Aluminum, Stucco Embossed: Thickness as follows:

Outer Insulation Diameter (Inches)	Minimum Aluminum Jacket Thickness (Inch)	
	Rigid Insulation	Non-Rigid Insulation (1)
8 and Smaller	0.024	0.024
Larger Than 8 Thru 11	0.024	0.024
Larger Than 11 Thru 24	0.024	0.024
Larger Than 24 Thru 36	0.024	0.032
Larger Than 36	0.024	0.040

(1) Non-rigid Insulation is defined as having a compressive strength of less than 15 psi.

3.20 INDOOR DUCT INSULATION SCHEDULE

A. Ducts Located Within Building Thermal Envelope:

1. Minimum R-Value = R-4.2.
2. Supply and Return Ducts: Mineral Fiber Blanket, 1-1/2 inches thick, 0.75 lb/cu. ft.

B. Ducts Located Within Building Outside Thermal Envelope:

1. Minimum R-Value – R-8.0.
2. Supply and Return Ducts: Mineral Fiber Blanket, 3 inches thick, 0.75 lb/cu. ft.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Furnish and install all necessary labor, materials, tools and equipment to perform and completely finish the work according to the intent of this specification, and the accompanying drawings.

B. Furnish and install any incidental work which can reasonably be inferred as required and necessary to provide complete and workable systems.

C. Provide connections of all equipment specified under these sections and other Divisions including Divisions 22 (Plumbing) and 23 (HVAC) including installation and connection of all motors, relays, remote starters, etc.

D. The requirements of the General and Supplemental Conditions, and Division 01 apply to Divisions 26, 27 and 28, and these specifications. All sections in Divisions 26, 27, and 28 are interrelated. Work specified in other sections, as applicable, shall apply to all work hereunder.

1.2 LOCAL CONDITIONS

A. Examine site; verify dimensions and locations against drawings and become informed of all conditions under which work is to be done before submitting proposal. No allowance will be made for extra expenses because of omission on Contractor's part to include cost of work under prevailing conditions.

B. Information shown relative to services is based upon available records and data shall be regarded as approximate only. Minor deviations found necessary to conform with actual locations and conditions shall be made without extra cost.

C. Extreme care shall be exercised in excavating near existing utilities to avoid any damage thereto. It shall be the contractor's responsibility to verify existing underground utilities prior to digging anywhere. Information provided on these plans indicating existing conditions shall only be used as reference and shall not be deemed considered accurate. Any damage to existing utilities done by the contractor shall be repaired and/or replaced by the contractor at their expense to its pre-damage condition.

1.3 PERMITS AND INSPECTIONS

A. Obtain and pay for all permits and service charges required in installation of the work. Arrange for required inspections and secure approvals from authorities having jurisdiction.

B. During its progress, work shall be subject to inspection by Project Inspector.

1.4 CODES AND STANDARDS

A. Work and materials shall be in full accordance with California Occupational Safety Health Act (CAL-OSHA), California Electrical Code (CEC), State Fire Marshal, Electrical Safety Orders (Title 8, Subchapter 5), the National Fire Protection Association, California Building Code (CBC); California Code of Regulations - Title 24 and other applicable State or local laws or regulations. Nothing in the Drawings or Specifications shall be construed to permit work not conforming to these codes.

B. Electrical materials shall be listed, labeled, or certified for its use by a Nationally Recognized Testing Laboratory such as Underwriter's Laboratories (UL), Factory Mutual (FM), etc.

C. Materials and components shall conform to Industry Standards, including:

1. NEMA - National Electrical Manufacturer's Association

2. ANSI - American National Standards Institute

3. ASTM - American Society for Testing Material Association

4. IPCEA - Insulated Power Cable Engineer's Association

5. CBM - Certified Ballast Manufacturers

D. When Contract Documents differ from governing codes, furnish and install larger size or higher standards called for without extra charge.

1.5 REVIEW OF MATERIALS

A. Prior to commencement of Work and within 35 days after award of contract, submit for approval in accordance with General Conditions all equipment and materials to be furnished.

1. Equipment/Product submittals shall be bound and indexed and shall include a table of contents listing all equipment submitted. The table of contents shall include: Project designation, submittal number, submittal name including specification section, date, and include manufacturer, model number, reference specification paragraph or sheet detail number, description, and page location. Where a group or series of products are submitted, each item does not have to be listed, only the series need to be identified. Example:

Project:
Submittal No.
Submittal Name:
Date:
Spec para.,

Page(s)	Manufacturer	Model No.	Detail No.	Description
1-12	XYZ Corp	123ABC	2.05	Control panel
13, 14	XYZ Corp	456DEF	2.06-A	Power supply
15	ABC Corp	789GHK	A/E9.5	Rack
16, 17	Cantex	PVC-40	2.01	PVC conduit
18	Steel City	XYZ series	2.02	Steel fittings

2. Shop drawings submittals shall be neat and professionally done using CAD (computer aided drafting), hand-drawn submittals will not be accepted. Shop drawings shall have sufficient information to clearly indicate work to be performed and be complete including device/equipment locations, wire sizes, wire types and number of wires, symbol list or legend, point-to-point connections, wiring diagrams, and equipment anchorage detail where needed. Shop drawings shall utilize the same size paper as the Bid set of plans.

B. Substitutions:

1. Only one (1) request for substitution will be considered on each item of material or equipment. No substitutions will be considered thereafter. Substitutions will be interpreted to be all manufacturers other than those specifically listed by model or catalog number. Should the original submittal of a proposed substitution be rejected, the specified item shall be furnished.

2. Submit complete information or catalog data to show equality of equipment or material offered to that specified. Identify which product is being substituted in the specifications and/or the plans and provide analysis as indicating either it "Complies" or that it "Does Not Comply" and providing a reason. Each Specification paragraph shall be provided with this analysis. No substitutions will be allowed unless requested and approved in writing. Materials of equal merit and appearance, in the opinion of the Engineer, will be approved for use. Engineer reserves the right to require originally specified item.

3. Acceptance of a substitute is not to be considered a release from the Specifications. Any deficiencies in an item, even though approved, shall be corrected by the Contractor at his expense.

4. Responsibility for installation of approved substitution is included herein. Any changes required for installation of approved substituted equipment shall be made without additional cost to Owner.

C. Where it is in the best interest of the Owner, Engineer may give written consent to a submittal received after expiration of designated time limits, or for an additional resubmittal.

D. Submit for approval in ample time to avoid delay of construction, shop drawings or submittals on all items of equipment and materials covered in list mentioned above. Submit in accordance with General Conditions in a complete package; partial submittals will not be considered.

E. Failure to comply with any of the preceding requirements will necessitate that the specified materials be submitted and supplied.

1.6 RECORD DRAWINGS

A. Upon completion of Work, furnish Engineer with AutoCAD file, PDF file, and one (1) printed full size hardcopy upon which shall be shown all Work installed under contract including any Work which are not in accordance with Original Contract Drawings. AutoCAD files shall be 2004 or later version, with external references bound to its parent drawing. Provide a separate PDF file for each sheet, do not combine all sheets into a single file. Furnish digital files on a USB flash drive or CD.

1. The above shall also include shop drawings.

B. All symbols and designations used in preparing Record Drawing shall match those used in Contract Drawings.

C. Show all buried and concealed conduit, stub-outs, etc. Locate all buried conduit and stub-outs by dimensions from permanent, easily located, and identifiable portions of structure; also, dimension ends of stub-outs, etc. Note depth of buried items below grade.

1.7 ADDENDA AND CHANGE ORDERS

A. Changes in the plans and specifications shall be made by Addenda or Change Orders signed by the Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials mentioned herein or on drawings require that each item listed be provided and of quality noted, or an approved equal. All material shall be new, full weight and standard in all respects and in first-class conditions. Where possible, all materials used shall be of the same brand or manufacturer throughout for each class of material or equipment.

B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein. Dimensions, sizes, and capacities shown are a minimum and shall not be changed without permission of Engineer.

PART 3 - EXECUTION

3.1 DRAWINGS AND COORDINATION

A. Examine Drawings and Site; be familiar with types of construction where electrical installation is involved. Work shall be neatly installed in a workmanlike manner in accordance with NECA Standard of Installation. Work shall be coordinated with other trades to avoid conflicts. Clarifications will be made by Engineer and minor adjustments shall be made without additional cost to Owner. Obtain ruling from Engineer concerning any obvious discrepancies or omissions in work before bidding. All work involved in correcting obvious errors or omissions after award of Contract shall be performed as directed by Engineer without additional cost to Owner.

B. Layouts of equipment, accessories and wiring systems are diagrammatic (not pictorial) but shall be followed as closely as possible. Drawings and Specifications are for assistance and guidance, and exact locations, distances, levels, etc., will be governed by Site.

C. All equipment (devices, conduits, boxes, etc.) shall be flush or semi-flush mounted unless otherwise noted. Where conditions do not allow flush mounting and where acceptable to the Architect, equipment may be surface mounted.

3.2 WORKING SPACE

A. Provide adequate working space around electrical equipment in compliance with Article 4 of Electrical Safety Orders. In general, provide 36 inches minimum clear workspace in front of panelboards and controls of 120/208 volt systems and 42 inches minimum for 277/480-volt systems.

3.3 CARE AND CLEANING

A. All broken, damaged or otherwise defective parts shall be repaired or replaced without additional cost to Owner. Work shall be left in a condition satisfactory to Engineer. At completion, carefully clean and adjust all equipment, fixtures and trim installed as part of this work. Systems and equipment shall be left in a satisfactory operating condition.

B. All surplus materials and debris resulting from this work shall be cleaned out and removed from site; this includes surplus excavated material.

3.4 EXCAVATING AND BACKFILLING

A. Excavate and backfill as required for installation of electrical work. Restore all surfaces, roadways, sod, walks, curbs, walls, existing underground installation, etc., cut by installations to original condition in an acceptable manner. Maintain all warning signs, barricades, flares, and lanterns as required by the Safety Orders and local ordinances.

B. Excavation: Dig trenches straight and true to line and grade, with bottom clear of any rock points. Minimum conduit depth of pipe crown shall be 24 inches below finished grade.

C. Backfill: Support conduits with 2-inch sand bedding at bottom of trench. Provide sand backfill from bottom to 12 inches below finished grade. The top 12 inches to be local

fine earth material free of rubble, rubbish, or vegetation. Trenches shall be backfilled and compacted to 90 percent (per ASTM D1557) of maximum dry density at optimum moisture content in layers not to exceed 6 inches when compacted.

3.5 PROTECTION

A. In performance of work, protect work from damage. Protect electrical equipment, stored, and installed, from dust, water or other damage.

3.6 EQUIPMENT IDENTIFICATION

A. Panelboards, remote control switches, terminal boxes, etc., shall be properly identified with a descriptive nameplate. Nameplate shall be made of 3/32-inch laminated plastic with black background and white letters. Size of letters shall be 1/4 inch high for equipment in device box or boxes 12 inches or smaller, and 1/2 inch high for panelboard, terminal can, or larger items. Letters shall be machine engraved. Punched strip type nameplates and cardholders in any form are not acceptable. Nameplates shall be attached with oval head machine screws tapped into front panel.

B. Indicate type of equipment and equipment designation, ex. "PANEL-XXX", "MAIN SWITCHBOARD-XXX", "TRANSFORMER-XXX", "SIGNAL-XXX", "TV-XXX", "EF-1", "AC-1", etc.

3.7 RUST INHIBITOR

A. Channels, joiners, hangers, straps, clamps, brackets, caps, nuts and bolts and associated parts shall be plated electrolytically with zinc followed immediately thereafter by treating freshly deposited zinc surfaces with chromic acid to obtain a surface which will not form a white deposit on surface for an average of 120 hours when subjected to a standard salt spray cabinet test or shall be hot dipped galvanized.

3.8 EQUIPMENT PADS

A. Concrete reinforced pads for mounting of equipment (i.e., switchboard, transformers, freestanding panels, etc.) shall be minimum 3,000 psi, 6 inch thick with No. 4 rebars at 12 inches on center each way. Rebars shall be centered in pad. Pad shall extend beyond equipment to create a safe working space. And 1.5 inch above surrounding area. Backfill and compact to 95 percent maximum dry density at optimum moisture content in layers not to exceed 6 inches when compacted.

3.9 EQUIPMENT ANCHORAGE

A. Seismic Anchorage of Electrical equipment shall conform to the regulations of CBC-2022 and ASCE 7-16, sections 13.3, 13.4, and 13.6. All equipment shall be braced or anchored to resist a horizontal force acting in any direction using the following criteria:

1. The total design lateral seismic force shall be determined from section 1613A California Building Code (CBC) 2022 and 13.3 ASCE 7-16. Forces shall be applied in the horizontal directions, which results in the most critical loadings for design.

2. The value of Ap (component amplification factor) and Rp (component response modification factor) of section 13.3.1 ASCE 7-16 shall be selected from section 13.6-1 ASCE 7-16. The value of Ip (seismic importance factor) shall be selected from 13.1.3 ASCE 7-16.

B. Where anchorage details are not shown on the drawings, the field installation shall be subject to the approval of the structural engineer and the field representative of the Office of the State Architect.

3.10 ARC FLASH

A. Electrical equipment such as switchboards, panelboards, load centers, motor control centers, industrial control panels, meter centers shall be field marked to warn persons of potential electric arc flash hazards per CEC 110.16 and NFPA 70E Standard for Electrical Safety in the Workplace. Minimum label wording shall be as follows:

DANGER
Arc Flash and Shock Hazard.
Appropriate PPE Required.
Do not operate controls or open doors without appropriate
personal protection equipment.
Failure to comply may result in injury or death.

3.11 TEST

A. Test all wiring and connections for continuity and grounds; where such test indicate faulty insulation or other defects, locate, repair and retest. Balance loads at panelboards. Furnish all testing equipment.

3.12 CLOSING OF AN UNINSPECTED WORK

A. Do not allow or cause any of work installed hereunder to be covered up or enclosed before it has been inspected and approved.

B. Should any work be enclosed or covered up before it has been approved, uncover such work and after it has been inspected and approved, make all repairs necessary to restore work of others to conditions in which it was found at time of cutting, all without additional cost to Owner.

3.13 WARRANTY

A. All materials and installation shall be provided with a one (1) year warranty which shall include replacement parts, labor, retesting, and travel to and from the job site. The warranty period shall begin after final acceptance of the project. The warranty shall cover but is not limited to the following:

1. Defective workmanship and installation.

2. All System components, devices, conduit, wires, etc.

3. Manufactured items such as light fixtures, receptacles, switchboard, panelboard, transformer, switches, etc.

4. Basic materials such as conduit, wires, boxes, cabinets, etc.

B. Certain manufactured items will have longer warranty periods. Refer to specific item and specification section for warranty information and terms.

3.14 SPARE PARTS AND SPECIAL SERVICE AGREEMENTS

A. A minimum of 5 percent attic stock on electronic lighting Control devices such as power packs, relays, occ sensors, wall switches, daylight sensors, plug load controllers, photocells, ETC.

B. Mechanical and Electrical systems that require regular, very specific maintenance to be performed to ensure their proper operation, funds should be Included in the bid package to cover the cost of regular maintenance intervals by outside specialist For the expected life of the equipment. A specific Example would be back-up power systems.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section describes specific requirements, products, and methods of execution which are typical throughout the electrical work of this project. Additional requirements for the specific systems may modify these requirements.

1.2 COORDINATION

A. Layout all the work in advance and avoid conflict with other work in progress. Physical dimensions shall be determined from Architectural and Structural plans. Verify locations for junction boxes, disconnect switches, stub-ups, etc., for connection to equipment furnished by others, or in other Divisions of this work.

1.3 WORKING SPACE

A. Provide adequate working space around electrical equipment in compliance with Article 110 of the National Electrical Code. In general, provide 36 inches minimum clear workspace in front of panelboards and controls.

1.4 SERVICEABILLTY OF PRODUCTS

A. Furnish all products to provide the proper orientation of serviceable components to access space provided.

B. Coordinate installation of panels, equipment, system components, and other products to allow proper service areas for all items requiring periodic maintenance inspection or replacement.

C. Replace or relocate all products incorrectly ordered or installed.

1.5 ACCESSIBILITY OF PRODUCTS

A. Arrange all work to provide access to all serviceable and/or operable products. Layout work to optimize net usable access space within confines of space available. Advise ARCHITECT, in a timely manner, of areas where proper access cannot be maintained. Furnish layout drawings to verify this claim, if requested.

B. Provide access doors in ceilings, walls, floors, etc., for access to junction boxes, automatic devices, and all serviceable or operable equipment in concealed spaces.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT FURNISHED IN DIVISION 26

A. All materials furnished and installed in permanent construction shall be American made, new, full-weight, standard in every way, and in first-class condition.

B. All materials shall conform with the standards of an organization acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of labeled equipment or materials and by whose labeling the manufacturer indicate compliance with appropriate standards or performance in a specified manner. Only materials designed for the purpose employed shall be used.

C. Materials shall be identical with apparatus or equipment which has been in successful operation for at least two (2) years. All materials of similar class or service shall be of one manufacturer.

D. Capacities, sizes, and dimensions given are minimum unless otherwise indicated. All systems, materials and equipment proposed for use on this project shall be subject to review for adequacy and compliance with Contract Documents.

2.2 MATERIALS AND EQUIPMENT FURNISHED IN OTHER DIVISIONS

A. Controls, including conduit, wiring, and control devices required for the operation of systems furnished in other Divisions shall be provided complete under the Division of the Specifications in which the equipment is specified.

B. All work on the project that falls under the jurisdiction of the electrical trade shall be performed by Licensed Electricians in conformance with the electrical specifications.

C. Provide complete power connections to equipment including but not limited to feeders, connections, disconnects and motor running overcurrent protection. Where starters are provided as part of a packaged equipment, overcurrent heaters shall be provided by the ELECTRICAL CONTRACTOR.

PART 3 - EXECUTION

3.1 STORAGE AND HANDLING

A. All items shall be delivered and stored in original containers, which shall indicate manufacturer's name, the brand, and the identifying number. Items subject to moisture and/or thermal damage shall be stored in a dry, heated place. All items shall be covered and protected against dirt, water, chemical and/or mechanical damage.

3.2 PROTECTION OF MATERIAL AND EQUIPMENT

A. The CONTRACTOR shall be responsible for any and all materials and equipment to be installed under this contract. The CONTRACTOR shall make good at his own cost any injury or damage which said materials or equipment may sustain from any source or cause whatsoever before final acceptance.

3.3 INSTALLATION

A. All materials and equipment shall be installed by skilled craftsmen. The norms for execution of the work shall be in conformity with CEC Chapter 3 and the National

Electrical Contractors' Association "Standards of Installation", which herewith is made part of these specifications.

B. Repair all surfaces and furnish all required material and labor to maintain fireproof, airtight and waterproof characteristics of the construction.

C. Installation of all equipment shall be in accordance with manufacturers' instructions.

3.4 SUPPORT SYSTEMS

A. Pipe straps and hanger rods shall be fastened to concrete by means of inserts, expansion bolts, or power-driven fasteners, to brickwork by means of expansion bolts and to hollow masonry by means of toggle bolts.

B. Hanger rods with spring steel fasteners may be used for 1-1/2 inches EMT and smaller conduits in dry locations.

C. Cable trays, multi-conduit runs, etc., shall be supported by double rods at each point of support and be supported independently of any other building system.

D. Provide sway bracing for suspended light fixtures and conduit supports per local seismic requirements.

3.5 MOUNTING HEIGHTS

A. Mounting height shall be to center of box above finished floor (AFF) as noted below unless otherwise shown or indicated. Other mounting heights are indicated on the drawings by detail. Specific dimensions AFF are shown adjacent to the symbol. Where devices are shown on architectural elevations, the elevation height shall govern.

Lighting switches	46 inches (48” Max. to top of box)
Convenience outlets and Similar devices	18 inches (15” Min. to bottom of box)
Convenience outlets in Mechanical, boiler rooms and workrooms	48 inches
Motor controllers	60 inches to top
Panelboards	76 inches to top
Telephone panels	72 inches to top
Bracket lights	84 inches
Exterior WP convenience Outlets	24 inches AFF

Telephone outlets	18 inches (15” Min. to bottom of box)
Doorbell push buttons	46 inches (48” Max. to top of box)
All bells, chimes and Similar signal devices	90 inches

3.6 CUTTING AND PATCHING

A. Obtain written permission of the ARCHITECT before cutting or piercing structural members.

B. Sleeves through floors and walls to be black iron pipe, or galvanized rigid steel, flush with walls, ceilings or finished floors, sized to accommodate the raceway. Grout all penetrations through concrete walls or floors. Holes through existing concrete shall be core drilled.

3.7 PROTECTIVE FINISHES

A. Take care not to scratch or deface factory finish of electrical apparatus and devices. Repaint all marred or scratched surfaces.

B. Provide hot dip galvanized components for ferrous materials exposed to the weather.

3.8 TESTING

A. Prior to final test, all switches, panelboards, devices, and fixtures shall be in place.

B. Test all electrical systems. They shall be free from short circuits and unintentional grounds.

C. Make all changes necessary to balance the actual electrical loads on the complete system. Arrange for balanced conditions of circuits under connected load demands, as contemplated by the normal working conditions. Final load and balance test shall be demonstrated in the presence of the ELECTRICAL ENGINEER.

D. Conduct a performance test of the ground fault system in accordance with CEC Article 230-95(c).

E. Furnish one (1) copy of certified test results to the ARCHITECT prior to final inspection.

3.9 CLEAN-UP AND COMMISSIONING

A. Throughout the work, the CONTRACTOR shall keep the work area reasonably neat and orderly by periodic clean-ups.

B. As independent parts of the installation are completed, they may be commissioned and utilized during construction.

4.1 WARRANTY

A. Unless otherwise specified, the warranty starts on the date written notice is given that the project is complete, and all required corrections have been made. Warranty shall certify that all defects in materials or Workmanship shall be promptly repaired or replaced by the CONTRACTOR, to the satisfaction of the Owner, for a period of one (1) year, except when in the opinion of the ARCHITECT such failure is due to neglect or carelessness by the Owner.

4.2 SPARE PARTS AND SPECIAL SERVICE AGREEMENTS

A. In order to preserve and or extend the finished new construction period that follows the completion of a project. (The new car smell). Spare parts shall be stored on site for items that are easily lost, broken, burned out, or fail before they should, i.e., but not limited to ballasts, fixture covers, fuses, specialty items, batteries, keys.

B. Mechanical and Electrical systems that require regular, very specific maintenance to be performed to ensure their proper operation, funds should be included in the bid package to cover the cost of regular maintenance intervals by outside specialist for the expected life of the equipment. A specific example would be back-up power systems.

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE

A. The work of this Section consists of basic materials and methods for all work included under Divisions 26, 27, and 28. Additional specifications requirements for electrical work are specified under other sections of Divisions 26, 27 and 28 and where those requirements differ from the requirements of this Section, they shall govern.

1.2 SUBMITTALS

A. Submit product data per Section 26 00 00.

PART 2 - PRODUCTS

2.1 CONDUIT

A. Rigid Steel Conduit: Standard weight, mild steel pipe, zinc coated on both inside and outside by a hot dipping or sherardizing process. Inside and outside of conduit shall be finished with a protective coating. All threads galvanized after cutting. Meets UL 6, UL Card No. DYIX, and ANSI C80.1.

B. Intermediate Metallic Conduit (IMC): Intermediate weight, mild steel pipe, meeting same requirements for finish and material as rigid steel conduit. Meets UL 1242, UL Card No. DYIX, and ANSI C80.6.

C. Electrical Metallic Tubing (EMT): Cold rolled steel tubing, hot-dipped galvanized, with zinc coating on outside and protective lubricating coating on inside. Fittings shall meet same requirements for finish and material as EMT. Meets UL 797 and ANSI C80.3.

D. Flexible Conduit: UL Listed. Flexible steel, zinc coated on both inside and outside by hot dipping or sherardizing process. Liquid-tight conduit shall be galvanized with extruded polyvinyl covering and with watertight connectors, sunlight resistant, direct burial rated. Flexible steel conduit less than 1/2 inch shall not be used except that 3/8 inch shall be permitted in lengths not more than 6 feet as part of a listed assembly or for tap connections to lighting fixtures as required in CEC Section 410-67(c). Flexible conduit to be one continuous length, no couplings. AFC Liquid-Tuff Type-LFMC and AFC Reduced Wall Flexible Steel Conduit, or equal.

E. PVC Conduit:

1. Type 40, 90 degree C, UL listed, composed of polyvinyl chloride, conforming to NEMA TC-2, Fed Spec WC1094A, UL651 Standards. Material shall have minimum tensile strength of 6,500 psi at 73.4°F, flexural strength of 12,500 psi and compressive strength of 9,000 psi per ASTM testing. PVC conduit shall be suitable for direct burial without concrete encasement. Fittings shall be of same manufacture. All joints shall be solvent welded.

2. Type 80, similar to type 40 except with extra heavy wall.

3. Only manufactured elbows/bends shall be used. Where field bends have to be made, obtain prior approval by the engineer.

F. Raceway Fittings:

1. Rigid Steel Conduit: Fittings, such as couplings, connectors, condulets, elbows, bends, etc., shall be subject to same requirements as for rigid steel conduit. Couplings and unions shall be threaded type, assembled with anti-corrosion, conductive anti-seize compound at joints made absolutely tight to exclude water. Connectors shall be threaded hubs with bonding insulated metallic bushings. Unions shall be equal to Crouse Hinds UNY or UNF.

2. IMC: Fittings shall be as specified for rigid steel conduit.

3. EMT: Fittings shall be steel; box connectors shall have insulated throat. Connectors and couplings to be compression type.

4. Flexible Metallic Conduit: Connectors to be insulated. Metallic connectors (except for liquid-tight) shall be steel "squeeze" type via a screw, Steel City XC-90X and XC-49X series. Liquid-tight metallic connectors shall be watertight approved for such use.

5. Bushings: Metallic insulated type. Weatherproof or dust-tight installations; liquid-tight with sealing ring and insulated throat, OZ/Gedney type "KR".

6. Expansion and Deflection Fittings: OZ/Gedney, Type "DX" or accepted equal.

7. All box connectors to be insulated throat type.

8. Conduit Straps: Galvanized steel, 2-hole straps. 1-hole straps may be used for conduit sizes 1 inch and smaller concealed in wall or above ceiling.

9. PVC Conduit: Fittings shall be same grade of material as conduit, solvent welded to conduit.

G. Metallic conduits, raceways, and fittings shall be listed and approved as a grounding means.

H. Hand dryers: Hand dryers to be Excel-BW-110-120V.

2.2 BOXES

A. Galvanized one-piece or welded pressed steel type. Boxes for fixture shall not be less than 4 inches square and shall be equipped with fixture stud. Boxes shall be at least 1-1/2 inch deep, 4-inch square for 1 or 2 gang devices, with plaster rings and gang box with gang cover. Boxes mounted in wall or ceiling finished with gypsum board shall be furnished with 3/4-inch-deep plaster rings. Use screws and not nails to support/secure outlet boxes. Provide blank cover plates for all boxes without devices.

1. 1-gang and 2-gang outlet and junction boxes installed exposed outdoors shall be weatherproof type FS, FD, WS, WD die cast metal or aluminum boxes, Appleton or equal. Plug all unused hubs.

2. Provide an equipment grounding pigtail at all receptacles, switch, and device outlet boxes. Ground conductor size to match circuit overcurrent protection complying with CEC.

3. Outlet boxes for data, telecommunications, video, and TV outlets shall be 4 11/16-inch square x 2.125 inch deep.

4. Outlet boxes containing No. 8, No. 6, or No. 4 AWG wires shall be a minimum 2.125 inch deep per CEC.

B. Junction boxes located outdoors, or in wet or damp locations shall be rated NEMA-3R, with hinged door and pad-locking tabs.

C. Floor boxes shall be one-gang or multi-gang recessed, fully adjustable with brass lids, cover plates, rings, flanges, etc. for respective tile or carpet floor finish, meet UL514A & UL514C scrub water exclusion requirements for tile and carpet floors. For carpet floors, provide with carpet flange. For "hard" floors such as tile or wood, the top of the cover shall be flush with the top of the finished floor. Receptacle covers shall have individual flip-lids with screw lock. Junction boxes shall have screwed on plugs.

1. Grade level or below: Watertight and concrete-tight of cast iron construction, Walker 880CS series or equal.

2. Above grade level: Concrete-tight of stamped steel construction, Walker 880S series or equal.

3. Raised wood floors: Steel box, Walker 880W series or equal.

D. Equipment furnished by other trade but require electrical connection shall be provided with appropriate backbox.

2.3 WIRES

A. Wire shall be copper only, manufactured by General Cable Co., Rome, General Electric Co., or Anaconda. Wire shall be rated 90 degrees C for both dry and wet locations, THWN-2, XHHW-2, or RHW-2 insulation. 90 degrees C THHN may be used in dry and damp locations. Wire installed in high temperature areas, including branch circuits in or above roof insulation or in fluorescent ballast channel, shall have type RHW-2 or XHHW-2 90-degree insulation.

1. Feeders sized No. 2 and larger routed below grade, extending beyond or outside the building foundation line shall use types XHHW-2, THW-2, or RHW-2 insulation, 90 degrees C dry and wet rated.

B. Wire shall be Code type copper wire of not less than 98 percent conductivity. All Wires shall be stranded. Wires shall bear the Underwriters' label, be color coded and be marked with gauge, type, and manufacturer's name on 24-inch centers. Wires smaller

than No. 8 may be stranded. Where stranded wire is used, provide solid pigtail for connection to screw terminals of receptacles, switches, etc.

C. Color coding to be as follows:

	208/120 Volts	480/277 Volts
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Natural Grey
Ground	Green	Green

Switch legs shall use the same branch circuit phase color coding which they are connected to. IG ground wire shall be green with yellow tracer.

D. Bring wire to job in original unbroken packages. Obtain approval of inspector or Engineer before installation of wires.

2.4 WALL SWITCHES

A. Shall be "AC" rated, heavy duty, quiet type, rated 20 amperes at 277 volts A.C. Application of switches shall comply with CEC Section 380-8. Handles shall be bakelite; color shall be compatible with adjacent wall finish. Switches to be as follows:

Manufacturer	Single Pole	3-Way 1993
A & H	1991	
Hubbell	1221	1223
P & S	20AC1	20AC3
Leviton	1221	1223

B. Weatherproof light switches shall have lever switch covers of die cast construction with gasket and gray finish. Hinged flip-lids are not acceptable.

2.5 CONVENIENCE OUTLETS

A. Shall be "Specification" grade rated 15 amperes at 125 volts, duplex, composition base with slots to accommodate parallel plug caps with grounding peg. Contact shall grip both sides of plug prongs. Where only one (1) receptacle is connected to a 20-ampere circuit, a 20-ampere receptacle shall be used. Outlet shall be UL listed. Receptacles to be Hubbell or equal.

1. 15 Amp: Hubbell 5262 series Heavy Duty Industrial Grade, 8200 series for Hospital Grade.

2. 20 Amp: Hubbell 5362 series Heavy Duty Industrial Grade, 8300 series for Hospital Grade.

3. Other designations as noted below:

4. Ground Fault: GFR

5. Tamper Resistant TR

6. Weather Resistant: WR

7. Isolated Ground: IG

8. Leviton 5252, 5352, 8200, and 8300 series can be considered equal.

9. Pass & Seymour 5252, 5352, 8200, 8300 series can be considered equal.

B. Provide devices with matching plates. Isolated ground (IG) receptacles shall be orange with matching color plate. Hospital grade receptacles shall have a distinctive "green" dot. GFI receptacles shall have a visible (light) indicator. Controlled receptacles shall be permanently and visibly marked with the universal power symbol and the word “CONTROLLED”.

C. All 15 and 20 Amp, 125V and 250V non-locking receptacles (NEMA 5-15, 5-20, 615, 6-20) located outdoors and/or in damp or wet locations shall be listed weather resistant type. Weather resistant receptacles shall be the same grade or class as 15A and 20A receptacles specified above.

D. Weatherproof covers for receptacles in wet locations shall be rated as weatherproof whether or not a plug is inserted (NEMA-3R), minimum 3.25-inch clearance from front of receptacle, metallic cast type with hinged lid and padlocking hasp, Leviton or equal. Weatherproof covers for receptacles in damp locations shall be rated as weatherproof when attachment plug is removed, with metallic cast cover and flip lids with padlocking hasp.

E. Provide a separate GFI duplex receptacle at each location identified on the drawings and as specified. Through wiring is not acceptable. Receptacles located at the following locations shall be GFI type, whether indicated in the plans or not.

1. In elevator control rooms.

2. In elevator pits/shafts.

3. In bathrooms or restrooms.

4. Outdoors, on the exterior of the building, and on/above the roof.

5. In commercial and institutional kitchens, unless dedicated to specific equipment.

6. Within 72 inches from any sink or basin such as in a small kitchen, lunch/break room, and the like.

F. Provide an equipment grounding jumper (pigtail) connecting the grounding terminal of the receptacle to the grounded box.

2.6 PANELBOARDS

A. Panelboards shall meet NEMA AB-1, PB-1, PB1.1, PB1.2. Panelboards shall be type NQ, NEHB, I-Line, Power-R-Line, A-Series, and CCB as specified for secondary utilization voltage and phase. As manufactured by Square-D, CutlerHammer/Eaton, General Electric, or approved equal. Square-D has been used for design purposes. Busses shall be copper. Provide with neutral buss and copper ground buss. Series rated equipment are not acceptable. Panels shall have full height fully rated bussing. UBC/CBC Seismic Rated.

B. Circuit breakers shall be bolt-on type thermal magnetic, single-pole and multipole for branch circuit control with trip-rating permanently marked on the handle. Where trip-rating is not marked on the handle, provide engraved label adjacent to the breaker indicating amperage rating. Multi-pole breakers shall be common trip type with single handle. Factory assembled and listed multi-pole breakers with handle ties shall be acceptable. Bails will not be accepted except when used with multi-wire branch circuits through fluorescent lighting fixtures. All circuit breaker handles shall be equipped with padlocking tabs, "lock-off" device. All circuit breakers shall be fully rated to withstand the available short circuit current as designated on the drawings. Series rated equipment will not be acceptable.

1. Circuit breaker frames of 300A to 600A shall have the following field adjustable settings; Long-Time PU, STPU, STD, GFPU, Inst. PU. Breakers shall be solid state with field adjustable rating plugs, or of the electronic type.

2. Circuit breaker trip frames over 600A and less than 1200A shall have the same features as the 300A frames, plus with field replaceable trip units/plugs,

3. Circuit breakers frames of 1200A and higher shall be solid state electronic type with full function trip units including the following field adjustable settings; LTPU, LTD, STPU, STD, Inst PU, Inst OFF, GFPU, GFD.

C. Enclosures shall be code gauge, galvanized metal with front trim and hinged door with lock master keyed. Front trim shall be equipped with concealed trim clamps and concealed door hinges. Enclosures shall be rated NEMA-1 at dry indoor locations, and NEMA-3R when located outdoors in damp or wet locations. Lighting and appliance branch circuit Panelboards shall be maximum 20 inch wide and 6 inch deep. Panel trim and cabinet shall be finished ANSI-49 or ANSI 61 gray, except panel cabinets to be recessed are not required to be painted. Surface cabinets shall be without knockouts. Inside door shall have frame for circuit identification card. Fill out card, typewritten, with list of circuits corresponding with the circuit number. Identification shall be specific with room designation, type of load, etc., (i.e., "Classroom 214 receptacles"). For distribution panels, provide engraved laminated labels for load served where identification card is not provided.

D. Panelboard submissions shall include; ladder diagram, physical dimensions and weight, electrical data and ratings, numbering and trip rating of each circuit breaker, accessories, etc. Panelboard shall bear the UL label of approval.

E. Panelboard types as indicated on the drawings shall be the minimum size and type. Provide a larger size and type of panelboard as necessary for the breakers and features/accessories as indicated.

F. Circuit breaker arrangement shall be per the panel schedule.

G. Panel nameplate label shall identify panel, minimum AIC rating, and equipment it is fed from, example as follows, "PANEL-XXX, MAX. 22,000 AIC, FED FROM YYY". Where fed via a transformer, it shall read, "PANEL-XXX, MAX. 14,000 AIC, FED FROM YYY THRU TRANSF-ZZZ". Label shall be engraved plastic per section 26 00 00. 1/2-inch letters for panel identification.

H. At existing Panelboards where existing loads, circuits, circuit breakers, spaces etc. are changed or affected.

1. Update circuit directory where existing loads, circuits, circuit breakers, spaces etc. are changed or affected. Replace existing directory card with new card, fill out card, typewritten, with list of circuits corresponding with the circuit number. Identification shall be specific with room designation, type of load, etc., (i.e., "Classroom 214 receptacles"). For distribution panels, provide engraved laminated labels for load served where identification card is not provided.

2. Circuit breakers added shall match existing type and AIC rating of panel. Provide necessary hardware.

I. Panelboards used for disaggregation of loads where more than one (1) load type is in the panel shall have these additional requirements.

1. Comply with CA Title-24 Part-6 for Disaggregation of Electric Circuits.

2. Common buss.

3. Disaggregated loads by Breaker Blocks, each sized from 6 to 42 circuits.

4. Additive/Subtractive metering option per breaker blocks.

5. 100 Amp maximum branch circuit breakers.

6. Future space for CT's for each breaker block.

7. Space for main metering including main metering CT's.

8. UL 67, UL50 Listed.

9. UBC/CBC seismic rated.

2.7 SAFETY/DISCONNECT SWITCHES

A. As a minimum, all switches to be provided with padlocking tabs and be lockable in the “open” position. Label switch with circuit identification per section 26 00 00, example "AC-1, HD1-24".

B. Type "HD" Heavy Duty safety switches with externally operated handle. Switches shall be manufactured by Westinghouse, General Electric, Square D, or approved equal. Switches shall be rated 250 and 600 volts, A.C., of size and poles as shown on Drawings and as required. Disconnects used outdoor shall be in NEMA-3R. Provide fused switches with proper sized fuses where required by equipment manufacturer. All switches shall have pad-locking cover with interlocking cover. Switches shall have pad-lockable tabs, lockable in both the ON and OFF positions.

C. For 120V and 277V fractional horsepower motors, disconnect switches can be heavy duty horsepower rated toggle switches or motor control switches.

2.8 INDIVIDUAL CIRCUIT BREAKERS

A. Circuit breakers shall be molded case thermal magnetic type with trip rating as scheduled on drawings.

1. Circuit breaker frames of 300A to 600A shall have the following field adjustable settings; Long-Time PU, STPU, STD, GFPU, Inst. PU. Breakers shall be solid state with field adjustable rating plugs, or of the electronic type.

2. Circuit breaker trip frames over 600A and less than 1200A shall have the same features as the 300A frames, plus with field replaceable trip units/plugs.

3. Circuit breakers frames of 1200A and higher shall be solid state electronic type with full function trip units including the following field adjustable settings; LTPU, LTD, STPU, STD, Inst PU, Inst OFF, GFPU, GFD.

B. Circuit breakers shall be quick-make, quick-break, trip free operation. The trip free mechanism shall be independent of manual handle control. All circuit breakers shall be fully rated to withstand the available short circuit current as designated on the drawings. Series rated equipment will not be acceptable.

C. Breakers to be in NEMA-1 (indoor) or NEMA-3R (damp, wet, and outdoor) enclosures. NEMA-3R enclosures shall have the handle concealed behind the cover, and the hinged cover shall be provided with padlocking tabs. Each circuit breaker shall be identified with an engraved, laminated phenolic plate showing the load served or the function of the circuit breaker and trip rating. The nameplate shall be attached with oval head machine screws tapped into the front of the board. Equip breaker handles with padlocking "lock-off" devices.

2.9 PULL LINE

A. Furnish and install pull line in all unused (empty) raceways. Pull lines shall not rot or mildew.

1. Conduits up to 1.5 inch: 1/8-inch diameter braided line of polypropylene with 200 lbs. tensile strength, IDEAL, Jet-Line No. 232, or equal.

2. Conduits 2 inches or larger: 3/16-inch polypropylene pull rope with 800 lbs. tensile strength, IDEAL Pro-Pull or equal.

B. Provide pull line in conduits for utility company systems, size, and type per their requirements.

2.10 ACCESS DOORS

A. Milcor, Newman or equal with concealed hinges, screwdriver locks, prime coated with rust inhibitive paint, and style of door to suit ceiling or wall construction, including fire rating. Access doors in acoustical tile ceilings shall be Hi-Hatch with tile recess. Doors shall be 14 gage C.R. steel and shall be 22-inch x 30 inch; 24-inch x 24 inches in tile ceilings, unless otherwise noted or required.

2.11 PRECAST CONCRETE PULLBOXES/HANDHOLES

A. Boxes shall be size as indicated on the drawings. Design loads shall consist of live, dead, impact, hydrostatic, and other loads. Live loads shall be for H-20 and/or H-20-S16-44, or as required, per A.A.S.H.O. standard specifications for highway bridges with revisions. Design loads shall be 16 KIPS. Concrete shall be per ASTM-C-33-64. Lightweight concrete shall conform to ASTM-C-3364T. Cement shall be Portland Cement meeting ASTM-C-150 Type II standards. Compressive strength shall be minimum 4,000 psi at 28 days.

B. Larger Boxes (48-inch x 30 inch or larger): Precast high-density reinforced concrete with end and side knockouts, pulling-in irons. Minimum 4-inch wall thickness. Coordinate size of thin wall knockouts with manufacturer for conduit entry. Acceptable manufacturers shall be Forni, Christy or equal.

C. Smaller Boxes (smaller than 48-inch x 30 inch): Precast high-density reinforced concrete with end and side knockouts, and extension as required. Minimum 1.5-inch wall thickness. Extensions shall be grouted. Acceptable manufacturers shall be Forni, Christy or equal.

D. Covers: Larger box covers, in other than concrete paving areas, shall be one or multi piece as required, steel checker plate, galvanized with anti-slip surface rated for parkway loading, with hold-down bolts. All other box covers shall be reinforced concrete with hold down bolts. Where susceptible to vehicular traffic, use H-20 rated traffic cover. All covers shall be factory marked, see drawings for marking/label required. If not noted, use the following markings:

SYSTEM	MARKING
Power 600 volts or less	Electrical
Power over 600 volts	Danger High Voltage-Keep Out
Telephone	Telephone
Clock, Unified Signal, etc.	Signal
Fire Alarm	Fire Alarm
Television	T.V.
Lighting	Lighting
Grounding	Ground

E. Installation:

1. Excavate around area to accept box, a minimum of 4 inches around all sides for ease of installation. Provide 12 inches of compacted pea gravel for bedding and/or to facilitate drainage.

2. Backfill shall consist sand or fine earth, compacted. Saturated soil or large rocks shall not be used. No voids shall remain between walls and native soil.

3. Grout and seal all joints conduits at box entry with cement. Provide End Bells on conduits.

F. Utility Co. boxes shall be per their requirements. Provide with ground rod as required.

G. The metal covers of pull boxes with power or lighting conductors shall be ground bonded to the feeder or branch circuit equipment grounding conductor(s) in the pull box.

1. All of the equipment grounding conductors in the pillbox shall be ground bonded together using the largest grounding conductor in the box or grounding terminal.

2. Ground bond the metal cover to the other ground conductors using the largest ground conductor in the pull box.

3. Other grounding methods are allowed where submitted and approved.

2.12 BACKBOARDS

A. Backboards shall be 3/4-inch plywood, type A-C grade fire treated for interior use, and type Exterior Grade for outdoor use. Backboards located outdoors shall be provided with one (1) coat primer and two (2) coats of exterior paint. Backboards in terminal cabinets shall be same as for interior use.

2.13 TERMINAL CABINETS

A. Terminal, relay, and contactor cabinets shall be code gauge, size as indicated with appropriate trim for mounting as indicated, with hinged door and cylinder type locks. NEMA-1 for indoor use in dry areas and NEMA-3R for outdoor use or in wet locations. Surface mounted cabinets shall not have knockouts. Provide backing plate/board for mounting equipment. Circle A-W or equal.

B. Provide engraved plastic label per section 26 00 00. Label shall identify the type of cabinet and designation, example "FIRE ALARM - FCA" and "EXTERIOR LIGHTING - RA".

2.14 LIGHTING CONTACTORS

A. Contactors shall be UL listed, rated minimum 30 amps at 120/277/480 Volts, electrically operated, for all types of lighting loads. Short circuit withstand rating shall

exceed maximum available short circuit amps. Coil voltage shall match control voltage. Square-D class 8903 type LO (electrically held) and LXO (mechanically held) or equal.

B. Contactors shall be installed on vibration isolators in Relay cabinets appropriately sized.

2.15 GROUND RODS

A. Ground rods shall be 3/4 in dia. x 10 ft. copper clad steel.

2.16 SURGE PROTECTIVE DEVICE (SPD) & SPARE PARTS

(Transient Voltage Surge Protector TVSS)

A. Where indicated at main service entrance, provide internally mounted SPD, Eaton Cutler-Hammer, or equal. Provide spare parts, one extra for each one installed. Where internal mounting is not practical provide externally mounted with close nipple connection, Leviton 57000 Series or equal.

1. Minimum surge current rating: 160 kA per phase.

2. Clamping performance rating per UL1449 3rd edition:

Mode	120/208V	480/277V
L-N	400V	800V
L-G	400V	800V
N-G	400V	800V

B. Where indicated at panels and other than main service locations, provide internally mounted SPD, Eaton Cutler-Hammer or equal. Provide spare parts, one extra for each one installed. Where internal mounting is not practical provide externally mounted with close nipple connection, Leviton 52000 Series or equal.

1. Minimum surge current rating: 100 kA per phase.

2. Clamping performance rating per UL 1449 3rd edition:

Mode	120/208V	480/277V
L-N	400V	800V
L-G	400V	800V
N-G	400V	800V

C. SPD devices shall be Listed and Component Recognized in accordance with:

1. UL 1449 Third Edition.

2. UL 1283.

3. NEMA LS-1 (1992) Low Voltage Surge Protective Devices.

4. ANSI/IEEE C62.41, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits, Category-C.

5. ANSI/IEEE C62.45, Guide on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits.

6. Comply with CEC Article 285.

D. The SPD shall be rated to withstand the available fault current.

E. Noise rejection at 50 Ohms, 5K - 100 MHz dB = -20 to -40.

F. Maximum Continuous Operating Voltage (MCOV) shall be at least 115 percent of the nominal voltage. MOV's to be minimum 34mm diameter.

G. Features shall include clamping envelope tracking, parallel-operated, built-in redundancy provides complete protection on all phases, modular design allowing replacement of modules, normal mode and common mode protection for WYE configured 3-phase systems, fuse protection for each module. Limited 5-year warranty.

H. The preferred method is to have the SPD unit internally mounted, which is either mounted directly to switchboard/panel bussing or within its enclosed compartment. Where external mounted unit is used, provide metal enclosure with hinged metal cover. External units shall be installed directly adjacent to panel it is protecting using close nipple connection. Provide in NEMA-3R cabinet when installed outdoors. Approx. size of 15.1-inch H x 13.1 inch W x 5.2 inch D.

2.17 SURFACE METALLIC AND NONMETALLIC RACEWAYS

A. The surface raceway system for branch circuit wiring and/or data network, voice, video and other low-voltage wiring shall be manufactured by the Wiremold Company, or equal. Raceway series as indicated on the plans. The raceway and all system components must be UL listed and exhibit non-flammable self-extinguishing characteristics. The raceway shall be a two-piece design with a base and a snap-on cover.

1. The nonmetallic raceway base and cover shall be manufactured of rigid PVC compound, available in ivory or white color. Exposed cuts shall be covered with cover clips.

2. The metal raceway base and cover shall be manufactured of galvanized steel, ivory finish and suitable for field painting.

B. A full complement of fittings must be available including, but not limited to flat, internal and external elbows, tees, entrance fittings, boxes, covers, adapters, cover clips, and end caps. The fittings shall match the base and cover and be of matching colors. All fittings shall be supplied with a base where applicable to eliminate mitering. A

transition fitting shall be available to adapt to other Wiremold series raceways. Field cuts shall be clean, straight, and true with no rough edges.

C. For multicompartment raceways, device brackets shall be available for mounting standard devices in-line or offset from the raceway. A device bracket shall be available for mounting up to four devices at one location. Faceplates shall match and fit flush in the device plate and shall overlay the cover and base to hide uneven cuts. They shall match the raceway base and cover. The raceway manufacturer will provide a complete line of connectivity outlets and modular inserts for UTP (i.e., data jacks), STP (150 ohm), Fiber Optic, Coaxial and other cabling types with face plates and bezels to facilitate mounting.

D. Work shall include furnishing all raceway and appropriate fittings and device plates to install a nonmetallic surface raceway system. Installer shall comply with detailed manufacturer's instruction sheets, which accompany system components as well as system instruction sheets. No single compartment non-metallic raceway for circuits over 100v.

E. Non-metallic raceway systems shall not be used in Assembly areas and other areas where the system is not rated for the installation. Assembly areas include but not limited to; gymnasiums, multipurpose rooms, auditoriums, conference rooms, etc.

2.18 COVER PLATES

A. Switch and receptacle cover plates shall be smooth nylon type. Cover plates for other devices/outlets such as data, telephone, television, etc. shall be nylon. Cover plate color shall be ivory, matching all systems.

B. For multi-purpose rooms, gymnasiums, kitchens, locker rooms, toilet/restrooms, and walls such as CMU, brick, concrete block, and concrete walls, device plates shall be smooth stainless steel with beveled edges.

C. Each receptacle shall have its circuit identification on the cover plate (i.e., "LA112"). Use typewritten "clear tape". Use black letters/numbers for light colored (white, almond, tan, beige, etc.) cover plates. For darker colored cover plates (black, brown, gray, red, etc.), tape to be white with black letters/numbers. Tape shall be located at the lower portion of the cover plate. Clean surface before adhesive tape is applied and wrap tape (approx. 1 inch) at each end around back side of each cover plate.

1. For floor boxes, plates shall be engraved with circuit identification.

2. For light switches, use same circuit identification method as for receptacles.

PART 3 - EXECUTION

3.1 CONDUITS AND CIRCUITS

A. All conduits shall be rigid steel or IMC except EMT may be used at following locations:

1. In dry locations in concealed furred spaces.

2. In partitions other than concrete, concrete block, or solid masonry.

3. For exposed work indoors and outdoors above 10 ft except:

   a. In special locations prohibited by Code, such as hazardous locations, rigid steel shall be used.

   b. Conduits exposed on/above the roof shall be rigid steel up to 10 ft above roof surface.

   c. Conduits exposed in Gymnasiums and Multi-Purpose Rooms shall be rigid steel up to 25 ft.

   d. Concealed above suspended ceilings or ceilings directly attached to structure above.

B. Flexible conduit: Shall be used to provide flexible connections of short length (3 ft or less) to equipment subject to vibration or movement and to all motors. Up to 6 ft is allowed where additional flexibility is needed. Provide a separate bonding conductor in all flexible connections/conduit. Flexible conduit shall be one continuous length without couplings.

   1. Secure flex conduit within 12 inches of each box, cabinet, conduit body, or other termination, and maximum 4.5 ft on center. Refer to the CEC for other secure lengths where flexibility is required or in other specific instances.

C. Run conduit concealed in areas having finished ceilings and in walls. Run all cross conduits and vertical risers or drops concealed in wall and/or partitions. Should it be necessary to notch any framing members, make such notching only at locations and in a manner as approved by the Architects. Where concealing conduit is not possible or practical, conduit may be run exposed in areas only where so permitted by the Architect. Install exposed conduit run neatly, parallel to or at right angles to structural members. Maintain a minimum of 6 inches clearance from steam or hot water pipes.

D. Support conduit with straps and secure to wood structure by means of bolts or lag screws, to concrete by means of insert or expansion bolts, to brickwork by means of expansion bolts, and to hollow masonry by means of toggle bolts. Expanders and shields shall be steel or malleable iron.

E. Do not install in concrete slabs.

F. Conduits installed in contact with ground shall be PVC-40 conduit.

   1. Provide a minimum 2 inch of sand bedding at the bottom of the trench before laying conduits. Maintain 2-inch separation between conduits. Maintain 12 inches separation between power conduits (120 Volts and greater) and low voltage signal conduits.

   2. Backfill shall be sand, from bottom to 12 inches below finished grade. Fine earth native backfill to be used for the last 12 inches.

3. Risers, including elbows, shall be double-wrapped rigid steel or PVC coated rigid steel conduit; except risers, including elbows and bends, at in-ground pull box locations shall be PVC-40 terminated with endbells.

4. When installing underground conduits to specified depth, depth shall be taken from the top of the conduit to the finished grade level. Unless otherwise specified, underground conduits outside of foundation line shall be installed with top side not less than 24 inches below finished grade.

    a. Conduits 1.5 inch and larger inside foundation line shall be below subgrade.

    b. Conduits 1.25 inch and smaller inside foundation line shall be installed on the subgrade, only one conduit high. Conduits shall cross under subgrade. Secure conduit to subgrade to prevent "floating".

    c. Backfill material within foundation line shall be sand.

5. Utility Company (electric, telephone, cable TV, etc.) conduits shall be installed per their depth and backfill requirements. Minimum depth shall be 24 inches below finished grade. Minimum conduit shall be PVC-40. Where the utility company allows use of a "lesser" grade conduit, i.e., DB120, PVC-40 shall be used.

6. The minimum size of conduits outside the foundation line shall be 1 inch, 3/4 inch inside the foundation line.

7. Bends shall be wide sweeping type with minimum 24-inch radius bends.

8. Manufactured elbows are required to be used for all 22.5 and 45-degree bends, and 90-degree elbows, and combinations thereof. Field bends may be used for other bends with approved field benders specifically for such purpose and such bends shall not compromise the integrity and nominal thickness of the conduit wall.

9. For all trenches, provide a 6-inch-wide non-biodegradable metal-detectable polyethylene tape at 12 inches below grade, 5-mil thick, labeled "CAUTION ELECTRIC LINE BURIED BELOW". Fluorescent red for electric power conduits and fluorescent orange "TELECOMMUNICATIONS" for telephone and signal conduits. Use Fluorescent red for common trenches. Tape shall be continuous for full length of trench.

G. Support individual conduits with 2-hole steel straps. 1-hole steel straps may be used for conduits 1 inch and smaller concealed in wall or above ceilings.

H. Galvanized iron hanger rods sizes ¼ inch diameter and larger with spring steel fasteners, clips or clamps specifically designed for purpose for conduits up to 1 inch size may be used.

I. Individual conduits 3/4 inch and smaller run above wire suspended ceilings may be supported from independent hanger wires with approved spring steel clips. Wire ties will not be acceptable. Wire shall be taut and secured to ceiling and structure above.

J. Support multi-parallel horizontal conduit runs with trapeze type hangers consisting of two or more steel hanger rods, cross channels, J-bolts, clamps, etc.

K. Sizes of rods and cross channels shall be designed to support four times actual load. Hanger rods shall have safety factor of 5 based on ultimate strength of material used.

L. Conduits for data, telecommunications, signal, video, TV, and/or containing fiber optic, coaxial, or OSP (outside plant) multi-pair cables shall have a minimum inside bend radius per CEC Table 346-10 (do not use exception); except conduits 2 inches to 4 inches shall be minimum 24 inches radius bends.

M. After installation of conductors, all conduits routed below grade shall be sealed at each opening, including risers and in pull boxes, to prevent the entrance of water and debris.

N. Relocatable (Portable) Buildings:

1. Where building is not secured to a permanent foundation, conduits connecting to Portable Buildings, shall be installed to allow 12 inches of building movement in all directions. Conduit riser shall extend to approximately 4 inches above ground 12 inches from the building, continuing with a flexible conduit connection to the panel, cabinet, junction box, etc.

2. For ease of disconnection for interior conduits, provide flexible conduit connection through junction box between building modules.

O. Conduit stubs: Conduits not terminated into a box or cabinet, such as stubbed to a backboard or above ceiling, shall be terminated with an insulated bushing. Bushings for metallic conduits shall be metallic type secured by set screw, compression, or threaded type. Bushings for PVC conduits shall be glued in place. Stubs above ceiling shall be turned 90-deg so the end is horizontal facing to prevent the entry of debris.

P. Although circuiting is shown as diagrammatic, their point-to-point destinations and their indication of above/below ground route shall be followed as much as possible. Where site conditions dictate that an alternate means of routing will alleviate conflicts, the alternate means will be considered with prior approval by the Engineer.

Q. Where cinder fill is encountered in Block walls, conduit shall be PVC-40 where in contact with cinder fill. Boxes shall be PVC type where in contact with cinder fill.

R. EMT conduit circuits installed on the roof, if allowed by the Engineer, shall have a ground conductor routed with the circuit conductors sized per the circuit protective device.

S. Horizontal runs of conduit above suspended wire lay-in ceilings shall not be less than 12 inches above the ceiling.

T. Maintain 12-inch separation between power circuits (>120V) and all signal circuits (data, telephone, speaker, clock, etc.) to prevent interference.

U. Feeder conduits connected to panels/switchboard shall have ground lug bushing connected to equipment ground buss with ground wire same size as largest ground wire in the panel/switchboard.

V. Conduits penetrating through the roof shall be secured within 12 inches below roof and supported within 12 inches of the penetration on the roof.

W. Where conduits cross building expansion/seismic joints provide a short length of flexible conduit (do not exceed 6 ft.) and fittings listed as a grounding means, or in locations where flex conduit cannot be used provide UL listed expansion/seismic fittings.

X. Conduits concealed in any masonry shall be routed in a conduit sleeve. Such sleeves shall not be placed closer than 3 diameters, center to center.

Y. Conduits to air conditioning (AC) equipment, fans, or other roof mounted equipment shall rise up from the ceiling below through the equipment curb or conduit window within the equipment, if allowed by equipment manufacturer, to prevent additional roof penetrations.

Z. Where conduit passes through finished walls or ceilings, provide steel escutcheon plates, chrome or painted as directed. Conduit which penetrates floor slabs, concrete or masonry walls shall be grouted and sealed watertight at penetrations.

AA. For 20-amp 120 or 277 Volt circuits using 90-deg C wires:

1. Do not install more than three (3) circuits in any conduit.

2. Do not install more than six (6) current carrying conductors in any conduit.

3. Where using No. 10 AWG wires to allow for conductor derating

    a. Do not install more than six (6) circuits in any conduit.

    b. Do not install more than 12 current carrying conductors in any conduit.

BB. Cables and Raceways installed under metal-corrugated sheet roof decking shall maintain a minimum 1.5 inch from the nearest surface of the roof decking per CEC. This shall not apply to RMC or IMC.

CC. Where switches control lighting loads supplied by a grounded branch circuit, the grounded conductor for the controlled lighting circuit shall be provided at the switch location. The grounded circuit conductor can be omitted where exceptions 1 and 2 apply. (CEC 404.2(C))

3.2 CAPPING

A. Cap conduits during construction with manufactured seals. Swab out conduits before wires are pulled in.

B. Cap all empty conduits below grade and in pull boxes with manufacturer's caps to prevent entrance of water and debris, attach pull string to cap.

3.3 FLASHING

A. Make conduit projecting through roof watertight by proper flashing. Secure a sheet lead cap with a tightening bend to conduit. Use two (2) collars for tar or asphalt composition roofings. Set one collar directly on roof deck and second collar set over on top of roofing felts. Lead sheet flashing shall be made of 4 lb. sheet lead. Use Stoneman No. 1100-4 series for individual conduits and No. 910/915 multi-flash for more than on conduit penetration, or equal.

3.4 PENETRATIONS OF FIRE RESISTIVE WALLS AND PARTITIONS

A. Penetrations of protected openings (fire rated walls, ceilings, floor-ceilings, roofs, etc.) shall be protected in accordance with the California Building Code, Part 2, Chapter 7, Title 24. Penetrations shall apply to conduits (raceways), cable trays, boxes, cabinets, panels, cables, etc.

B. Fire stopping shall be provided at penetrations of fire resistive walls, floors, ceilings, floor-ceiling assemblies, and roofs. Fire-stopping shall have a "F" and/or "T" rating as determined by tests conducted in accordance with ASTM E 814 or UL-1479. Fire stopping system/materials shall be UL Listed.

3.5 ACCESS DOORS

A. Furnish and install access doors wherever required whether shown or not for easy maintenance of electrical systems; for example, inaccessible areas and attics containing heat detectors, junction boxes, etc. Access doors shall provide for complete removal and replacement of equipment. Provide fire rated access doors when located in fire rated partitions.

3.6 BOXES

A. Nails shall not be used to support outlet boxes. Boxes must be accurately placed for finish, independently and securely supported by adequate wood backing or by manufactured adjustable channel type heavy-duty box hangers. For metal stud construction, use metal box hangers only. Box hangers shall be securely tied or welded (where permitted) or screwed to metal studs. Paint weld with rust inhibitor. Boxes installed in masonry tile or concrete block construction shall be secured with auxiliary plates, bars or clips and be grouted in place.

1. Outlet boxes with receptacles or switches: Provide a solid pigtail (green) ground wire grounded to the metallic outlet box. Pigtail shall also ground device and separate ground conductor if available. Size of ground wire to match overcurrent protection.

B. Locate outlets at the following heights above floor to the center of the device or handle unless otherwise noted on Drawings or in Specifications.

1. The top of the outlet box shall not be higher than 48 inch above finished floor, and the bottom of the outlet box shall not be less than 15 inch above finished floor. For forward or side approach over counter, maximum 44 inches and 46 inches respectively to top of box.

2. Convenience Outlets: 18 inches (4 inch above counter or splash).

3. Local Switches: 45 inches.

4. Telephone Outlets: 18 inches (45 inches for wall phone).

5. Data, TV Outlets: 18 inches.

6. Where devices are shown at counter locations, they shall be located approximately 4 inch above counter, clearing back-splash where applicable.

7. Refer to elevations and details on Architectural Drawings for exact heights and locations of all electrical outlets for switches, receptacles, special equipment, etc. Where above heights do not suit building construction or finish, consult Architect.

C. Install pull boxes or junction boxes as required in accessible spaces but do not install in finished areas unless approved by Architect.

D. Where fire rated construction is required (refer to Architectural Drawings), do not locate electrical outlet boxes back-to-back. Provide a minimum of 24 inches horizontal separation between outlet boxes on opposite side of the same wall. Where such restrictions cannot be met, provide fire-stopping around box such as 3M Moldable Putty Pads or equal.

E. Boxes up to 100 cubic inches located in suspended wire ceilings may be supported through an independent hanger wire with approved tension clips. Wire shall be taut. Secure wire to the structure above and the ceiling below.

3.7 CONDUCTORS

A. Splices and joints for No. 10 AWG or smaller wiring shall be twisted together electrically and mechanically strong and insulated with approved type insulated electrical spring connectors Ideal WING-NUT. Joints and connections for No. 8 AWG or larger shall be made with Burndy, T & B, or approved equal, solderless tool applied pressure lugs and connectors. Uninsulated lugs and wire ends shall be insulated with layers of plastic tape equal to insulation of wire and with all irregular surfaces properly padded with "Scotchfil" putty prior to application of tape. Tape shall be equal to Scotch #33, General Electric No. AW-1, or approved equal. Feeder splicing is not permitted.

1. In special instances where feeder splicing is allowed by the Engineer, it shall be made with high compression sleeve type connector followed by manufactured

splicing kit utilizing as insulators, resins poured into a ready-to-use plastic mold to provide a uniform, moisture-proof tough, impact-resistant insulation.

2. Conductor splices below grade shall meet ANSI C119.1-1986 and UL 486D Standards. Raychem WCSM or FCSM heavy wall heat shrink tubing; or RVS or RVC series if use of flame heat is prohibited. Conductors to be joined with compression sleeve connectors.

B. Use only UL approved wire pulling compound as lubricant.

C. Lace conductors together with waxed linen lacing cord, T & B "Ty-Rap", Holub "Quik-Wrap" or equal, in a neat and workmanlike manner in panelboards, wireways, raceways, pull boxes and similar locations.

D. No. 12 AWG wire shall be minimum size wire used for lighting and power circuits. Motor control circuits may be No. 14 except as marked on Drawings, unless shown.

E. Provide cable supports in risers by means of a clamping device with insulated wedges or "Kellem" grips.

F. All conductors shall be in conduit unless otherwise indicated.

G. Conduit sizes shall be based on code fill table for THW insulated wires to accommodate the number, size, and type of wires shown or specified.

H. Wiring installed in pull boxes or junction boxes, where wire is pulled through without terminations (except splices), shall have a service loop around the interior of the box for 360 degrees utilizing the largest circumference.

I. Use No. 10 AWG conductor for 20 Amp 120 Volt circuit home runs longer than 75 feet, and for 20 Amp 277 Volt circuit homeruns longer than 200 feet.

J. Where conductors are increased in size and number (such as for voltage drop reasons), such that conductors will not fit the standard breaker or panel lugs, terminate conductors in one of the following means:

1. Provide larger breaker frame or panelboard.

2. Provide oversized lugs.

3. Last option only with approval from Engineer: Terminate wires in multiport connector and provide pigtail. Splice to be made in panel or switchboard if space is available, or in separate splice box. This option will not be normally granted.

3.8 PANELS AND CABINETS

A. Recessed enclosures (panelboards, terminal cabinets, cabinets, control cabinets, etc.) shall be provided with a minimum of three (3) 3/4 inch empty conduits stubbed into accessible space above the ceiling. Drawings may require additional conduits.

3.9 GROUNDING

A. Grounding and ground bonding of the electrical installation shall be in accordance with CEC Article 250, and any applicable codes. Ground fittings shall be approved manufactured type, installed, and connected to conform with Code requirements.

B. Neutral conductors and noncurrent-carrying parts of equipment at each installation shall be grounded in accordance with applicable code. Ground conductor shall be copper having a current capacity sized in accordance with CEC.

C. All equipment cases, motor frames, etc., shall be completely grounded to satisfy requirements of CEC. Install bond wire in flexible conduit. Install copper bond wire, sized in accordance with CEC, in all nonmetallic raceways and bond to all metallic parts using approved fittings.

D. Service ground conductor shall be connected to a "Ufer" encased ground and bonded to the metallic cold water pipe system and to the metallic natural gas line.

E. Interior metallic cold water pipe system and other interior metallic piping systems shall be ground bonded to the building grounding system.

F. Each building shall be provided with a grounding electrode connected to the metallic enclosure of the building disconnecting means. Grounding electrode conductor shall be sized per CEC table 250-66.

G. Total ground resistance shall not exceed 25 ohms.

H. All connections shall be made with solderless connectors or molded fusion welding process.

I. Equipment grounding conductors shall be insulated with a continuous green outer finish along its entire length. Conductors size No. 4 AWG and larger may be identified (with green electrical tape applied half-lapped) at each end and at every point where the conductor is accessible. Tape shall be applied from its point of entry to point of exit or termination.

J. Insulated grounded (neutral) conductors shall be identified with a continuous white outer finish along its entire length. Neutral conductors No. 4 AWG or larger can be identified by a distinctive white marking (applied half-lapped with white electrical tape) for the last 12 inches at each end.

K. Where equipment is 1000 Volts or above, fence grounding shall be provided per CEC.

1. Provide a ground rod at each corner fence post and at line posts at least every 40 ft. Ground rods to be 5/8" x 8 ft buried below grade.

2. All ground conductors to be minimum No. 2 bare copper. Ground conductor to be buried 30 inches below grade following outside fenced enclosure. Provide ground connections between ground rods, at fence posts, at gate posts, to equipment, etc. for a complete looped system.

3. Each gate post shall be grounded and provide flexible braided copper strap ground connection to gate. Corner gate post shall have a ground rod.

4. Ground equipment rated 1000V or higher to ground conductor.

5. Connections to be exothermic welds or ground clamps rated for such use.

6. Each gate shall be bonded to its gatepost by flexible braided copper strap.

3.10 FIELD TESTS

A. General: Perform field test in the presence of the Owner's Representative except as otherwise specified. Provide required labor, materials, equipment, and connections to perform tests. Document results and submit them to the Owner's Representative. Repair or replace all defective work.

B. Perform Insulation Resistance (IR) "Megger" Testing per NETA Standards.

Submit test results. Provide testing for:

1. All feeders 100 Amps and higher.

2. Branch circuits 100 Amps and higher.

C. Verify operation of starters and install overload protection devices sized in accordance with the motor full load current.

D. Each ground rod shall be tested. A ground rod which does not have a resistance to ground of 25 ohms or less shall be augmented by one additional ground rod at no less than 8 feet from each other. Submit test results.

3.11 CIRCUIT BREAKER COORDINATION

A. Provide protective device (fuses and breakers) coordination study on the distribution system to determine circuit breaker settings for electronic breakers and other breakers with adjustable tripping characteristics, and all protective devices 300 amps or more. The coordination shall be with the immediate downstream and upstream protective device(s).

B. Plot time-current characteristics of the specified protective devices using log-log paper. Include the following minimum information, as pertinent to system, on plots:

1. Complete titles.

2. Representation One Line Diagram and legends.

3. Power company's relays or fuse characteristics.

4. Complete operating bands of low voltage circuit breaker trip curves.

5. Fuse curves.

6. Protective relay type selected and curves.

   Maintain reasonable coordination intervals and separation of characteristic curves on plots. Provide sufficient curves to clearly indicate the coordination achieved to the main breaker, feeder breakers and load protective devices rated 300 amperes or more.

C. Summarized the results of the power system study in a bound final report. Organize the report using the following sections:

1. Description, purpose, basis, written scope, and a single-line diagram of the portion of the power system which is included within the scope of study.

2. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip settings, fuse selection, and commentary regarding same.

3. Provide a separate tabulated list for the selection and settings of the protective devices. Include the following minimum information:

   a. Circuit identification.

   b. IEEE device number (Where applicable)

   c. Manufacturer, device type and range of adjustment.

   d. Recommended settings.

3.12 GROUND FAULT PROTECTION AND TESTING

A. Where indicated on the plans, provide circuit breaker with ground fault protection. The ground fault system shall include a memory circuit for positive tripping action despite intermittent arcing ground faults.

B. Provide an integral means of testing the ground fault system to meet the on-site requirements of CEC Articles 230 and 517.

C. Provide acceptance testing per InterNational Electrical Testing Association Inc. (NETA) specifications and standards. Submit test results.

3.13 CLEANING

A. Brush and clean work prior to concealing, painting and acceptance. Performed in stages if directed.

B. Clean and repair soiled or damaged painted exposed work and match adjoining work before final acceptance.

C. Remove debris from inside and outside of material, equipment, and structures.

3.14 WARRANTY

A. All materials and installation shall be provided with a one (1) year warranty which shall include replacement parts, labor, retesting, and travel to and from the job site. The warranty period shall begin after final acceptance of the project.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Basic Electrical Requirements, materials, and methods common to multiple electrical systems, specifically applicable to all Sections in Division 26.

B. Related Sections

1. Section 05 05 55 – Tamper Proof Metal Fastenings.

2. Section 26 08 13 - Acceptance Testing.

1.2 REFERENCES

A. CEC- 2022 - California Electrical Code, Part 3, CCR Title 24 and 2022 California Fire Code, Part 9, CCR Title 24.

B. NEMA ICS-6-R2006 - Industrial Control and Systems: Enclosures.

1.3 DEFINITIONS

The meaning of words shall be as defined in the CEC Article 100, Definitions, unless defined otherwise in an individual section.

Inmate Accessible Areas: Areas within the prison project, at and below ten feet above adjacent floor or grade, except as specifically exempted in Section 05 05 55, or by the County Representative.

Exercise Yard: The area surrounded by housing units and associated support buildings to the fence connecting the buildings including the exterior of these buildings.

Exposed Fasteners:

Fasteners not completely concealed within building construction.

Fasteners which may be accessed and removed, without the prior removal of other fasteners designated as “tamper proof” or “security”.

A. Exposed Locations: All locations are considered exposed, except the following;

1. Mechanical and electrical rooms.

2. Areas above suspended ceilings, behind access panels, and within pipe and duct chases.

3. Roofs.

4. Control rooms, however, control consoles are considered exposed.

5. Within fences around equipment pads at distances greater than 4 feet from fence.

B. Security Screws/Fasteners: Tamper proof metal fasteners as specified in Section 05 05 55; removable or non-removable types as indicated.

C. Secured Perimeter System: System comprised of double fencing, gates, towers, lighting, and electronic detection system.

D. The following specification development organizations are referenced throughout the various specification sections of Division 26:

1. AASHTO - American Association of State Highway and Transportation Officials.

2. ADAAG - Americans with Disabilities Act Accessibility Guidelines

3. Air Pollution Control District, Air Quality Management District

4. ANSI - American National Standards Institute

5. AQMD - Air Quality Management District

6. APCD - Air Pollution Control District

7. ASME - American Society of Mechanical Engineers

8. ASTM - American Society for Testing and Materials

9. CBC - California Building Code

10. CCR - California Code of Regulations Title 24. State Chapters.

11. CEC - California Electrical Code

12. CFC - California Fire Code

13. CMC - California Mechanical Code

14. CSA - Canadian Standards Association

15. EIA - Electronic Industries Association

16. FCC - Federal Communications Commission.

17. FM - Factory Mutual.

18. FS - Federal Specifications

19. ICEA - Insulated Cable Engineers Association

20. IEC - International Electrotechnical Commission

21. IEEE - Institute of Electrical and Electronic Engineers

22. IETA - International Electrical Testing Association

23. ISA - Instrument Society of America

24. ISO - International Organization for Standardization

25. MIL - Military Specifications

26. NACE - National Association of Corrosion Engineers

27. NECA - National Electrical Contractors Association

28. NEMA - National Electrical Manufacturing Association

29. NETA - International Electrical Testing Association

30. NFPA - National Fire Protection Association

31. NIST - National Institute of Standards and Technology

32. OSHA - Occupational Safety and Health Administration

33. SMACNA - Sheet Metal and Air Conditioning Contractors National Association, Inc.

34. UL - Underwriters Laboratories

1.4 SYSTEM DESCRIPTION

A. Performance Requirements

1. Furnish and install all materials to provide functioning systems in compliance with performance requirements specified, and any modifications required by reviewed shop drawings and field coordinated drawings.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data

1. Submit product data grouped to include complete submittals of related systems, products, and accessories in a single submittal.

2. Quantity of Submittals Required

a. Submit six (6) copies of product data.

b. Five (5) copies will be returned.

c. If comments are required, comment sheet(s) will be returned with each copy.

d. One (1) copy will be retained by the Engineer.

C. Shop Drawings

1. Submit shop drawings grouped to include complete submittals of related systems, products, and accessories in a single submittal.

2. Submit a composite drawing for each cell chase, including the coordinated layout of all other trades' distinct components and detailing the intended electrical installation.

3. Quantity of Submittals Required:

a. Submit one reproducible transparency and one print.

b. Upon review, transparency will be annotated and returned. Print will be retained by Engineer.

c. Copies of this transparency will serve as record copies for Architect and Engineer.

d. Additional prints will not be reviewed nor returned.

4. Corrections or comments made on the shop drawings during review do not relieve the Contractor from compliance with requirements of the drawings and specifications. Shop drawing checking by the Engineer is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor is responsible for:

a. Confirming and correlating all quantities and dimensions.

b. Selecting fabrication processes and techniques of construction.

c. Coordinating his work with all other trades.

d. Performing his work in a safe and satisfactory manner.

e. Provide equipment that can be installed in the available space with all code clearances. This shall be coordinated prior to ordering any equipment.

D. Samples

1. Submit as directed by the architect and as required in each specification section.

E. Quality Control/Control Submittals

1. Submit material control record procedures for approval. Submit records during the project upon request by the County Representative. Submit at the end of the project for record.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements

1. Conform to CEC.

2. Furnish products listed and classified by UL or other independent laboratory acceptable to the County Representative as suitable for purpose specified and shown when a listing is available for the type of product.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle and protect products under provisions of Section 01 65 00.

B. Maintain material control records for all products for traceability to manufacturer and order number. Have records available for inspection by the County Representative.

C. Store material and equipment in an environment similar to the final installation environment.

D. Store and handle material and equipment in accordance with manufacturers' recommendations.

1.8 PROJECT CONDITIONS

A. Electrical plan drawings show only general locations of equipment, devices, and raceway, unless specifically dimensioned.

B. Install Work in locations shown on Drawings, unless prevented by Project conditions.

C. Prepare and submit drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of the County Representative before proceeding.

1.9 SEQUENCING AND SCHEDULING

A. Sequence work under provisions of Section 01 31 13.

B. Coordinate the incoming electrical and telephone service with the local utility companies Contractor providing service. Install utility service trench and duct systems in accordance with the servicing utility company requirements.

C. Coordinate Hand Hole locations with existing site conditions. Hand Hole is approximately 5 feet from building or as indicated on drawings.

1.10 SHORT CIRCUIT AND PROTECTIVE DEVICE COORDINATION STUDY

A. Provide a short circuit and protective device coordination study and arc flash study to the County Representative for review and approval. Provide all short circuit characteristic information on electrical equipment. Provide time current curves for all circuit breakers

in the submittal. Set and adjust all devices in accordance with the results of this study before energizing equipment.

1.11 MAINTENANCE AND SERVICE

A. Maintenance and service shall be provided as part of the Contract during the two-year warranty period starting the day that Project Completion is awarded by the County Representative.

1. Contractor shall be responsible for systems and system components as defined in these documents.

2. Scheduled maintenance shall be conducted on a weekly and quarterly basis. Responsibilities for scheduled maintenance are as follows:

   a. Weekly - County's personnel.

   b. Quarterly - Contractor's personnel.

3. All maintenance activity shall be conducted on a schedule that is convenient to the County Representative. All Contractors personnel shall provide written notice of all visits.

B. Daily operational inspections by County shall consist of inspections to determine the operational state of a system. It is not intended that the County perform adjustments or modifications for system restoration.

C. Non-scheduled maintenance will be initiated by staff personnel as a result of daily inspections or operational use of the systems. Categories of maintenance support and the response time for system restoration are defined as follows:

1. Critical - Items which compromise the security of the facility or have an adverse effect on the operations of the facility. Items in this category shall be returned to service within eight (8) actual hours after receipt of a service call. Service shall be available on a seven (7) day, twenty-four (24) hour basis.

2. Sensitive - Items which adversely impact the operations of the facility but are not considered "critical" as defined above. Items in this category shall be returned to service within forty-eight (48) actual hours after receipt of a service call. Service shall be available on a normal eight (8) hour, five (5) day a week basis.

3. Normal - Items which require maintenance support but are not "critical" or "sensitive" as defined above. These are typically items which staff personnel identify and accept that maintenance during the standard quarterly inspection.

D. Contractor shall provide scheduled maintenance in accordance with the description of services and maintenance schedule.

E. Contractor shall maintain all documents and modify drawings, schedules, and other documents as required to effect documentation which reflects the current system or wiring configuration.

F. Upon termination of the service contract, Contractor shall return all system documents to the County Representative.

G. Contractor shall develop maintenance reports, or logs, which identify maintenance activities on the system. If requested, the reports, or logs, shall be provided to the County Representative on a monthly basis.

H. In the event software is introduced which will enhance the system operation, Contractor shall inform the County Representative of the software, its features, and the cost to upgrade the existing software. If accepted by the County Representative, Contractor shall furnish and install the software and invoice County in the amount approved by the County Representative. Contractor to train the County staff on new system features or software which may be provided to enhance the systems capability.

I. Insurance requirements shall be maintained through the maintenance and service period.

1.12 SPARE PARTS

A. Spare parts shall be provided and maintained by Contractor to support the maintenance response requirements defined in this document

B. The spare parts inventory may be comprised of Contractor furnished, Contractor maintained parts.

C. Contractor shall maintain a spare parts inventory as he deems necessary to support the maintenance and service requirements of this section.

D. During the maintenance and service period, Contractor shall maintain a log of all component failures and parts replaced.

E. Six (6) months prior to the expiration of the maintenance and service period, Contractor shall submit the replaced parts log to the County Representative. The County Representative will use the replaced parts log to evaluate the on-site spare parts inventory required for future maintenance by the County.

F. At a minimum, the following spare parts shall be stored at the site in a location identified by the County Representative. The spare parts shall be property of the County. This requirement is not intended to include all spare parts required to meet the service response time limits. The contractor shall replace any of these spare parts, if used for service work during the warrantee period within 10 days. The spare parts shall be the same type submitted and installed in the facility.

1. Branch panelboard circuit breakers. (One for each type)

2. Fuses. (One set of three for each type)

3. Lighting occupancy sensors and switches. (Two of each type)

PART 2 – PRODUCTS

2.1 EQUIPMENT

A. Weatherproof Equipment

1. Where weatherproof (WP) equipment is indicated, use NEMA 3R or NEMA 4 cast metal or stainless-steel enclosures where applicable unless otherwise specified or indicated.

B. Outdoor Equipment

1. Equipment and devices to be installed outdoors or in unheated enclosures shall be capable of continuous operation within an ambient temperature range of 32 degrees F. to 120 degrees F.

2.2 SOURCE QUALITY CONTROL

A. The County Representative may elect to visit manufacturers'/suppliers' facilities prior to, or at any time during, fabrication of equipment. Manufacturers/suppliers shall grant access to their facilities for the County Representative visits.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install equipment to permit easy access for normal operation and maintenance to switches, motors, drives, pull boxes and receptacles in accordance with CEC Article 110, Requirements for Electrical Installation.

B. Coordinate electrical work with the County Representative and work of other trades to avoid conflicts, errors, delays, and unnecessary interference with operation of the plant during construction.

C. Check and coordinate the approximate locations of electrical stub-ins, light fixtures, electrical outlets, equipment, and other electrical system components shown on Drawings for conflicts with openings, structural members, and components of other systems and equipment having fixed locations. In the event of conflicts, notify the County Representative in writing. The County Representative's decision shall govern. Make modifications and changes required to correct conflicts.

3.2 HOUSEKEEPING PADS AND FOUNDATIONS

A. Concrete work required for housekeeping pads and foundations shall be provided by General Construction Work.

B. Furnish required dimensional drawings and specify locations. Minimum height of housekeeping pads shall be 4 inches and shall extend out 6 inches from the footprint of the equipment.

C. Furnish anchor bolts and sleeves and verify accuracy of installation.

D. Provide for:

1. Switchboards.

2. Floor mounted ATS.

3. Distribution panels.

4. Floor mounted transformers.

5. Other items as required.

3.3 SITE TESTS

A. Test under provisions of Section 26 08 13.

1. At completion of installation, test for operation, panel load balance, short circuits, and ground.

2. Each building service and separately derived system to have neutral bonding jumper opened and neutral and ground buses to be tested for infinite resistance. Test to be demonstrated to the County Representative. Where infinite resistance is not achieved, correct deficiencies and retest in the presence of County personnel.

3. Provide written test results for all tests.

3.4 ADJUSTING

A. Adjust work under provisions of Section 26 08 13.

B. Inspect all equipment and put in good working order.

3.5 CLEANING

A. Clean work under provisions of Section 01 35 43.

B. Clean all items.

3.6 PROTECTION

A. Protect finished installation under provisions of Section 01 35 43.

B. Prior to installation, store items in clean, dry, indoor locations. Store in clean, dry, indoor, heated locations items subject to corrosion under damp conditions, and items containing

electrical insulation, such as transformers, conductors, motors, and controls. Energize all space heaters furnished with equipment. Provide temporary heating, sufficient to prevent condensation, in transformers, switchgear, switchboards, motors, and motor control centers which do not have space heaters.

C. Following installation, protect materials and equipment from corrosion, physical damage, and the effects of moisture on insulation. When equipment intended for indoor installation is installed at the Contractor's convenience in areas where it is subject to dampness, moisture, dirt, or other adverse atmosphere until completion of construction, ensure that adequate protection from these atmospheres is provided that is acceptable to the County Representative. Cap conduit runs during construction with manufactured seals. Keep openings in boxes or equipment closed during construction. Energize all space heaters furnished with equipment.

3.7 FINAL CONNECTION

A. Make final connection to the power distribution system at the building service point.

3.8 PUTTING SYSTEMS IN OPERATION - START UP

A. Operate all systems in good working order for a period of five (5) consecutive days, at time period agreed to by the County Representative, prior to inspection.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The requirements of this section are in addition to the requirements of Division 1, General Conditions and Supplementary Conditions.

1.2 SUMMARY

A. Scope: Provide grounding system as shown on the Drawings and described in the Specifications.

B. Related Work Specified Elsewhere:

1. Section 260000, GENERAL REQUIREMENTS, ELECTRICAL

2. Section 260533.13, CONDUITS AND FITTINGS

3. Section 260519, CONDUCTORS

4. Section 260533, BOXES AND TERMINATIONS

1.3 QUALITY ASSURANCE

A. Except where specifically noted otherwise, ground all non-current carrying metal parts of all electrical systems, equipment, and devices in strict accordance with applicable Electrical Codes. All ground fittings shall be approved for use in grounding systems and installed as required by applicable codes.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. All grounding conductors shall be copper.

B. Where it is necessary to enclose a single grounding conductor in metallic conduit, the conductor must be securely bonded to the conduit with approved grounding bushings at each end whether it is insulated or not.

2.2 CONNECTORS

A. Connectors used for grounding conductors No. 8 AWG and larger and all conductors below grade, in the slab, or outdoors shall be Burndy, Cad-Weld, or Ampact.

PART 3 - EXECUTION

3.1 REQUIREMENTS

A. Install the grounding electrode system shown on the Drawings and as required by applicable Electrical Codes. Test the system and verify that the resistance of the

grounding electrode conductor to ground – as measured from the point where the conductor will be connected to the service equipment – is less than 25 ohms. Where this is not achieved, augment the system with additional electrodes until it is.

B. An insulated copper ground wire shall be installed in all conduits, whether branch circuitry feeder conduit containing wiring operating at 120 volts (nominal) or greater, whether overhead or underground, regardless of conduit material and regardless of type of load (for example: Lighting or power). This shall be done whether or not a ground wire is specifically indicated on the drawings. This ground wire shall be sized per code.

C. Where equipment grounding conductors are indicated on the Drawings, a separate insulated copper equipment grounding wire, sized per NEC or as shown, shall be installed with the circuit conductors shown.

D. Ground each data distribution frame rack/enclosure. Ground the enclosure by means of a No. 6 AWG copper conductor connected to the building ground at the first ground bus. Install the ground conductor in conduit.

E. Provide a UFER ground for each building. Ground each building's electrical distribution system at one point by means of a UFER ground. Install the UFER ground near the highest voltage panel with the most capacity. Connect the UFER ground to the panel's ground bus with a conductor sized per CEC 2022, 250-94. Connect all other panels to the first panel's ground bus by a conductor sized per CEC 2022, 250-95 installed in conduit sized per the minimum size required by CEC 2022 Informative Annex C.

F. Ground rods, where used, shall not be less than 5/8 inch in diameter and 10 feet long. They shall be driven to within 4 inches of full length into the earth. Bonding to the rod(s) shall be with Burndy, Cad-Weld, or Ampact connectors.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work specified in this Section.`

PART 2 - PRODUCTS

2.1 OUTLET BOXES

A. Outlet boxes shall be pressed steel knockout type and shall be hot dipped galvanized or sherardized. All boxes shall be of proper code size for the number of wires or conduits passing through or terminating herein, but in no case shall any box be less than 4 inches square, unless specifically noted as smaller on the drawings. Covers shall be of the types most suitable for the fixtures or devices used at the outlets, and shall finish flush with plaster or other finished surface. Boxes in concrete shall be a type, which will allow the placing of conduit without displacing the reinforcing bars.

B. Outlet boxes shall be equal to the Steel City or Bowers Manufacturing Company.

2.2 FLOOR BOXES

A. Floor boxes shall be concealed service type, 90 cubic inches total capacity, decorator, polyamide plastic top with 5/32 inches steel reinforced hinged access plate. Floor plate shall be suitable for use in carpeted or tiled floors. Box interior shall have barriers to permit use of both power and communications receptacles. Boxes shall be Hubbell, Catalog No. B2503 with, one No. S2925 or two No. S3725 brass duplex receptacle face plates depending on whether indicated to be single or double duplex outlet, brass blank plate, custom drilled for the required communications system outlets and wire tunnel if used for double duplex receptacles.

B. Cast iron floor boxes shall be watertight, adjustable flanged round units with combination 2 feet and 1/2 inches brass screw plugs. Boxes shall be one of the following:

Hubbell	No. B-2503
Thomas & Betts	No. 1763
Steel City	No. 601
Lew Electric	No. 532 – No. 535

C. Ganged cast iron floor boxes shall be used only as specifically called for on the drawings. Boxes shall be watertight, adjustable rectangular units with integral partitions between each compartment with the number of gangs as required. Boxes shall be one of the following:

D. Hubbell No. B-4233 and B-4333 or approved equal of General Electric and Lew Electric.

E. At locations where equipment is connected with floor boxes, use short elbows, T&B 4250, 51, or 52, for riser from side of box.

F. Duplex receptacle in floor box shall be grounding type as hereinafter specified under "Receptacles" and shall be mounted in cast iron floor box with hinged, lockable flush brass cover. Floor box shall be adjustable watertight unit, Lew No. 632-DF.

2.3 EXTENSION TYPE OUTLETS ON FLOOR BOX

A. Extension fitting for duplex receptacle shall be Walker/Parkersburg No. 500LR housing and baseplate with ivory duplex grounding type receptacle as herein before specified. Unit shall be mounted on cast iron floor box as herein before specified under "Outlet Boxes" with proper adapter and nipple for mounting to floor box.

B. Extension fitting for two duplex receptacles back-to-back shall be identical to the single unit except housing shall be two No. 500DR receptacle plates.

C. Extension type public telephone riser on floor box shall be Walker/Parkersburg No. 507AL, No. 509AL or No. 518AL special telephone fitting finished brushed aluminum complete with proper nipple and adapter for mounting to floor box. This Contractor shall install the type of outlet at each box location as instructed by the Telephone Company Engineers.

D. Extension type intercommunicating telephone, P.A. handset or buzzer system on floor box shall be Walker/Parkersburg No. 501AL, cast aluminum, satin finish, with proper nipple and adapter for mounting to floor box.

2.4 FLUSH FLOOR COUPLINGS

A. Flush couplings 1/2 inches to 2 inches shall be brass, complete with slotted brass plug, and shall be equal to Hubbell No. F-1139, No. F1539, No. F-1739, No. F-1939 and No. F-2139. For conduits larger than 2 inches, use regular coupling with plumber's type brass plug.

2.5 PULLBOXES

A. Pull boxes shall meet all code requirements as to size for conduits terminating therein and to thickness of metal used in fabrication or casting.

B. Fabricated sheet steel pull boxes shall be installed only in dry protected locations and shall be furnished with required knockouts and removable screw cover. Box shall be finished with one coat of zinc chromate and a coat of primer sealer and where exposed to public view shall be painted to match the surroundings.

C. Weatherproof sheet steel pull boxes shall be fabricated of code gauge galvanized sheet steel with two (2) coats of rust resistant finish and shall be furnished with gasket and made completely watertight.

D. Cast iron pull boxes shall be furnished with gasket screw cover, drilled and tapped holes as required. Boxes shall be as manufactured by T&B, Alhambra Foundry Company, or Russell and Stoll. Where cast iron pull boxes are called for as being flush with finished grade, boxes shall have integral flange or trim.

PART 3 - EXECUTION

3.1 OUTLET BOXES

A. Outlet boxes shall be used as pull boxes wherever possible, and junction or pull boxes shall be installed only as required by the drawings or specifications, or as directed.

B. All outlet boxes that finish to an exposed brick or concrete block surface shall have 1-1/2 inches deep tile rings and shall be set to allow a brick or concrete block facing over the ring to frame the opening. Tile rings shall not be grouted into exposed brick or concrete block walls. Center outlet in a course of brick or concrete block. Standard plastering will not be accepted.

C. Unless otherwise specified or noted on the drawings, boxes for the various outlets shall be as follows:

1. For light outlet boxes use minimum of 4 inches square, 1-1/2 inches deep, equipped with plaster ring and fixture supporting device as required by the unit installed.

2. For wall switch outlets, use 4 inches boxes with single or two gang plaster rings for one or two switches and solid gang boxes with gang plaster rings for more than two switches, unless noted otherwise on the drawings.

3. For convenience outlets, use 4 inches boxes with single gang plaster ring.

4. For public telephone outlets, use 4 inches square boxes with single gang plaster rings.

5. For clocks, use recess cabinets as recommended by the clock manufacturer for flush mounted clocks.

6. For bells, custodian call outlets, and horns on exterior and for break-glass fire alarm stations, use 4 inches square box with single gang plaster ring, unless special back box is provided with device.

7. For electric thermostats, use 4 inches square boxes with single gang plaster rings.

8. For emergency stop push button stations, use 4 inches square box with 2-gang plaster rings.

9. For range outlets, use 4-11/16 inches square by 2-1/8 inches deep with 2-gang plaster rings.

10. For outlets not specified, use boxes and mounting heights as directed.

D. 3.1.4 All outlet boxes shall be accurately placed and securely fastened to the structure independent of the conduit. Particular care shall be taken in locating outlet boxes in acoustic tile. The plaster ring shall be set flush with the finished surface of the ceiling

wall. Hangers shall be used to support outlet boxes in all ceilings. Hangers for lighting fixture outlets shall have adjustable studs.

E. Crouse-Hinds “condulets” shall be used for all switch, receptacle and junction outlets where conduit is exposed.

F. Outlet boxes above accessible suspended ceilings may be supported by devices manufactured for the purpose from the main ceiling members if they are placed so that they do not interfere with either the installation of recessed lighting fixtures or the removal of ceiling tile.

G. All outlets shall be installed square and true, at the proper heights and shall be coordinated with the other trades to insure a proper installation.

H. Color-coding of all outlet boxes:

1. Every concealed outlet box, junction box, sheet metal pull box, etc., shall be color coded with spray paint, inside and out, including a short section of the conduits terminating therein. The outside cover of the box shall also be painted the same color. For surface exposed conduit and boxes on finished walls and/or ceiling only the inside of the box and blank cover plate need to be painted. Avoid overspray on to finished surfaces.

2. This color code spray paint shall be applied soon after conduit and boxes are installed opt assure paint being applied opt clean surfaces. Note: Avoid overspray onto adjacent conduits or surfaces.

3. The outside of the blank covers shall have the system name painted thereon with black (or other color) permanent felt tipped marking pen. Example: FA, IC, 208V, etc.

4. The color code shall adhere strictly to the following schedule:

120/208 Volt Wiring	Black
Fire Alarm	Red
Security	Light Blue
Telephone/Intercom	Green
Program Clock	White
Data	Orange

3.2 FLOOR BOXES

A. Where carpeting occurs, floor boxes shall be complete with carpet flanges.

B. Floor boxes shall be set flush with finish floor and set on concrete pier to prevent movement during final pour of floor.

3.3 FLUSH FLOOR COUPLINGS

A. Flush floor couplings shall be adjusted to be flush with floor during pouring and finishing of floor.

B. For coupling 2 inches and larger use plumbers plug. Use oil or grease on top of, and in threads to prevent sticking.

3.4 FIRESTOPPING

A. All outlet boxes installed in rated walls (1 or 2 hours) shall not be closer than 24 inches. All such outlet boxes shall also be wrapped with an approved firestopping pad(s). U.L. listed and certified pad(s) shall be IPE Type FSP1077 or equal by Nelson. Outlets or boxes greater than 16 inches square shall be enclosed in a rated enclosure equal to the rated wall in which installed.

B. Floor boxes in concrete slabs that penetrate the slab shall be similarly protected.

C. All concrete in ground boxes exposed to vehicle traffic shall have traffic rated covers.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work specified in this Section.

1.2 RESTRICTIONS ON USE

A. Wireways, gutter and surface metal raceways shall be used only for exposed work as defined in the NEC.

PART 2 - PRODUCTS

2.1 SURFACE METAL RACEWAY

A. Pressed Steel:

1. Factory prepared, steel metal raceway shall be used for all exposed interior wiring.

2. Each run shall include all outlet boxes, elbows, couplings, tees, offsets, covers and other fittings necessary for a complete and properly installed assembly.

3. All surface metal raceway shall be of the size recommended in the manufacturer's published data for the number and size of conductors contained in the raceway and shall be equal to the Wiremold Co.

PART 3 - EXECUTION

3.1 SURFACE METAL RACEWAY

A. All surface metal raceway runs shall be parallel or at right angles to the basic lines of the building. Wherever practical runs shall be routed adjacent to moldings, corners or other surface features which will make the entire installation the least conspicuous.

3.2 INSTALLATION

A. All raceways shall be concealed in floors, slabs, walls, underground or above ceilings as shown on the Drawings or as dictated by construction conditions at the site. Minor revisions to conduit routing or outlet locations need not be recorded. Exposed runs are allowed only where shown on the Drawings or at surface mounted equipment in unfinished areas. Raceways shall be of the type suitable to the conditions of installation.

B. Rigid Steel Conduit (RSC) may be used in all areas. Rigid steel shall be used wherever

conduit might be subject to physical abuse either during construction or facility utilization. All threaded connections of rigid steel conduits and fittings regardless of location shall be "doped" with waterproof conductive compound to assure the prolonged integrity of the system. T&B "KOPR-SHIELD" is recommended. Rigid steel conduit installed underground, embedded in a footing, or installed in slab on grade shall be PVC coated or wrapped with corrosion protective tape manufactured for this purpose.

C. Intermediate Metallic Conduit (IMC) may be used in all indoor areas not in contact with earth.

D. Electrical Metallic Conduit (EMT) may be used in dry indoor areas that are not in contact with earth, not subject to damage and not in concrete slabs.

E. EMT may be used below portable and modular buildings in crawl spaces. EMT shall be attached to the bottom of floor supports.

F. Flexible Metallic Conduit (Flex) may be used in all dry indoor areas for final connections to recessed lighting fixtures where shown on the drawings and to other relocatable or other vibrating equipment (motors, mechanical equipment and transformers) in dry locations only. Flex may also be used in protected spaces where EMT is not practical because of obstructions such as pipes, vents and other mechanical equipment.

G. Liquid-Tight Flexible Metallic Conduit (LTFlex) shall be used for final connection to vibrating or movable equipment (water heaters, motors, transformers, HVAC equipment, etc.) in all areas, where cleaning operations, abnormal operating conditions, or equipment or device failure could cause water, refrigerant, oil, or other liquid to be sprayed or spilled on the raceway.

H. Schedule 40 PVC conduit may be used below grade when encased in sand or concrete, or below concrete slabs. All joints in PVC systems shall be cemented watertight with bonding adhesive as recommended by the conduit manufacturer. PVC conduits 2 inch diameter (trade size) and larger shall have rigid steel elbows installed in accordance with all requirements for rigid steel conduit. Schedule 80 PVC shall be installed under footings where directed, and in other locations where directed or otherwise required by codes or utility company standards.

I. Schedule 40 PVC conduit may also be used to stub-up through concrete footings and foundations, to outlets in protected spaces to 16 inches.

J. Schedule 40 PVC conduit may be used in crawl spaces below portable or modular buildings under the following circumstances.

K. Surfaced mounted, on earth, where the conduit originates outside of the building: All conduit surfaced supported by earth shall be properly staked at 10 foot intervals and at cross-overs.

L. Surfaced mounted to the bottom of floor supports.

M. Electrical Non-Metallic Tubing (ENT) shall not be used on this project.

N. Maximum voltage in Single channel surface Non-Metallic raceway (i.e., Panduit) is 100 V. Circuits greater than 100 V shall be installed in Non-Metallic raceways with at least two (2) channels or more.

O. Surface Mounted Raceway shall be used only where shown on the drawings.

P. Exposed raceways in finished areas shall be painted to match adjacent surfaces.

Q. Avoid field made bends and offsets wherever possible; but where they must be made, use approved bending “hickey” or bending machine. Bends of multiple runs shall be made in parallel planes and/or concentric. Use of direct flame on PVC conduit or heating of metal conduit to facilitate bending is prohibited. Exposed conduits, where allowed, shall be run parallel to intersections of building surfaces or structure, vertical, or horizontal as required for a neat and orderly appearance. Concealed conduits in walls shall be run vertical or horizontal only.

R. Minimum conduit size shall be 1/2 inches diameter (trade size) or 3/4 inches diameter where installed underground or in or under slab. After installation, clean the conduit interior of construction debris, dirt, water, or other material and cap both ends watertight until time for pulling in conductors.

S. Ream and remove all burrs in conduit installation to prevent damage to conductor insulation. Seal conduit ends until time for pulling wires.

T. Raceways shall not touch each other or other pipes except where directed and for a specific purpose other than support. Metal Raceway shall not touch water, drain, or gas piping at any point. Raceways shall not pass through or interfere with HVAC ducts. Maintain at least 1/2 inches of separation between parallel power and inter-communications/signal conduits.

U. Wall or ceiling penetrations shall be sealed as indicated elsewhere in these specifications. Grout raceway penetration suitable for the specific conditions of each penetration and finish to match adjacent surfaces.

V. Where penetration of a fire rated surface is required, seal the opening with an approved “Fire Stop” compound installed in strict accordance with manufacturer’s instructions for each specific application. After the compound has set as recommended by the manufacturer, paint the seal assembly to match adjacent surfaces.

W. Wood members shall be bored – not notched – for the passage of electrical raceways. Protect from damage in accordance with NEC Article 300-4.

X. Provide structure as may be required for support of raceway per applicable Electrical Code(s) and at each change of direction. Use conduit clamps manufactured for this

specific use and secure to structure with wood screws, bolts and locknuts, rivets, or bolts and concrete anchors as required. Do not use wire, steel strap stock, or nails to secure raceway. For special applications or where use of one or two-hole conduit clamps is impractical, approved Caddy fasteners may be used. Do not use nailing straps.

Y. In metal stud construction, use approved Caddy or B-Line clips, clamps, and hangers manufactured for the specific application. Raceway passing through steel studs shall be firmly secured to each stud with approved clamps, Tie-Wrap, or steel wire as applicable. These connections are to prevent rattling and they are in addition to the conduit supports required by NEC. Note that tie wire may be used for this application, but it may not be used as required support equipment.

Z. In empty conduits and stubs, install No. 12 TW pull wire for conduits less than 1-1/4 inches diameter (trade size); and 3/16 inches polypropylene pull rope in conduits 1-1/4 inches diameter and larger.

AA. All pull wires or ropes installed in empty conduits shall have waterproof tags attached at each end identifying the location of the other end and the intended future use of the conduit.

BB. Every empty conduit leaving a panel board box, equipment rack, terminal cabinet, or other enclosure which is not required to have a pull rope installed shall be identified with a permanently attached plastic tag or band identifying the location of the stub and the intended future use of the conduit. Adhesive embossed tape alone is not acceptable. Markings shall be permanent and sufficiently descriptive to be useful years hence.

CC. The entire electrical raceway system shall form a continuous metallic electrical conductor and shall be ground by connection to the main service ground. A ground wire shall be installed in each conduit.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work specified in this Section.

1.2 APPROVED AND MARKING

A. All raceways shall comply with the requirements of the Underwriter's Laboratories and shall be delivered to the site in standard lengths with each length bearing the manufacturer's trademark or stamp and the Underwriters' label of approval.

1.3 CONDUIT DEFINITION

A. Where conduit is mentioned in this Specification, this shall be interpreted as rigid, standard weight steel conduit. Intermediate metal conduct (IMC), electrical metallic tubing, aluminum, polyvinylchloride, or flexible metallic conduit shall be use used only where specified herein or noted on the drawings.

1.4 RACEWAYS OTHER THAN CONDUIT

A. Raceways other than conduit (in the general sense) such as wire ways, surface mounted raceway (Wiremold), cable tray, etc., shall only be used when, where and as allowed by the drawings and this Specification and in compliance with the CEC.

1.5 PROHIBITED CONDUITS

A. Any raceway that is available with conductors already installed, type MC, AC, or MCAP.

PART 2 - PRODUCTS

2.1 CONDUIT AND FITTINGS

A. Rigid steel conduit shall be zinc coated on the exterior and may be zinc or enamel on the interior. Couplings and locknuts, etc., shall be hot dipped galvanized or sherardized. All couplings, etc., shall be of the threaded type only.

B. Bushings for standard weight rigid steel conduit shall be nonmetallic for 1 inch and smaller. For conduits 1-1/4 inch and larger, insulated metallic bushings shall be used. Bushings shall be O.Z. Electric Mfg. Co., Type "B" regular type or Type "BL" grounding type.

C. Intermediate metal conduit (IMC) shall be rigid, zinc coated steel meeting UL 1242. Couplings, locknuts, and bushings for IMC shall be threaded, comparable to those specified for standard weight rigid steel conduit.

D. Electrical metallic tubing shall be galvanized or sherardized. Couplings and connectors shall be galvanized or cadmium plated steel, insulated throat and shall be of the compression or set-screw type. Approved manufacturers are:

Appleton
Bridgeport
Regal

E. Flexible metallic conduit shall be standard or intermediate weight hot dipped galvanized steel and shall have all fittings hot dipped galvanized or sherardized. Fittings shall be the squeeze type. Fittings which use a screw to bind against tubing will not be accepted. Screw-in "Jake" connectors will be accepted only if the conduit is cut "square." Aluminum flexible conduit is not acceptable under this specification.

F. Neoprene jacketed flexible metallic conduit shall be UL listed. Type UA, liquid tight (sealtite). See this Section under "Execution" for mandatory application of liquid tight flexible conduit. Fittings shall be equal to Appleton "STN" series.

G. Polyvinyl-chloride (PVC) conduit shall be rigid heavyweight type, Schedule 40, Underwriters' approved, complete with PVC fittings.

H. Rigid aluminum conduit shall not be used.

PART 3 - EXECUTION

3.1 UNDERGROUND CONDUIT INSTALLATION

A. All conduits installed underground, regardless of type of material or size, shall have minimum 2-inch separation between conduits and shall be provided with a yellow warning tape to read "Caution – Electrical Line." Underground conduit shall be installed a minimum of 24 inches below grade to the top of the conduit.

1. Exception: Branch circuit PVC conduit, 1 inch trade size and smaller may be installed 6 inches below the vapor barrier and base material. Riser ELLS shall be 20 mil. PVC taped rigid steel. No portion of the bend of the ELL shall extend above finish floor. Conduit shall have 1 inch (minimum) separation from each other.

B. Underground conduits shall be rigid, heavyweight (Schedule 40 or heavier) PVC.

C. Underground runs originating or terminating in underground manholes or concrete pull boxes of 3 feet or larger in any one (1) dimension shall be rigid steel conduit into and for the first 10 feet (approximate) away from the manhole or pull box.

D. Underground runs 2 inches and larger shall not have two (2) consecutive pull boxes with outside accessibility, i.e., the 2nd box must be in a securable structure, the third box can be exposed the 4th cannot.

E. All riser ELLS and conduit extensions from underground PVC runs shall be rigid steel conduit only. Conduit extensions from rigid steel ELLS which are exposed or rise in a masonry wall shall be rigid steel only. Extensions from rigid steel ELLS into concealed areas may be rigid steel or EMT at the Contractor's option.

F. Conduits installed in underground trenches shall be securely fastened in place so that absolutely no shifting will occur during backfill and compaction. Three (3) alternate methods of securing conduits are suggested.

1. Interlocking type plastic spacers set on concrete bases.

2. Installation of conduits in the cells of concrete blocks placed at every joint.

3. Patented steel stakes with bracket arms spaced on intervals equal to the conduit section length.

4. Other methods must be specifically approved by the Architect.

G. The minimum separation between power and low voltage system conduits shall be 12 inches.

H. All underground conduits containing wiring with over 110 volts to ground shall include a properly sized ground wire.

I. Conduit stubs installed for future extensions shall be rigid steel for at least 5 feet of the conduit run. The conduit ends shall be terminated with couplings and pipe plugs. The closed end shall be double wrapped with Scotchrap No. 50 for the last 12 inches. The concrete envelope shall leave 3 inches of the wrapped conduit exposed for future connection.

J. All underground conduit stubouts, group of stubouts, in one location or pull box installed below grade in conduit run, shall be furnished with concrete monuments, 6 inches by 6 inches by 15 inches deep buried flush with grade, over the capped ends or pull box, or in lieu of concrete monuments as described, a brass identification plate may be permanently attached to building or concrete curb stating the exact distances and directions of the conduit or pull box location. The exact location of the monument or tag shall be shown on the “as-built” drawings.

1. The face of monuments shall be furnished with 3 inches square brass plates securely mounted and engraved with the number and size of conduits or pull box.

K. Where storm drains, sewer lines and other gravity lines are to be crossed by conduits, grade stakes shall be set for the gravity lines, elevations of conduits shall be set for the gravity lines and elevations of conduits shall be put at proper depth so that there will be no conflict with storm drains, sewer lines and other gravity lines. It shall be the responsibility of the Contractor to coordinate elevations of all conduits to miss all gravity lines. Where conduits are installed and not properly coordinated, it shall be the responsibility of the Contractor to remove and reconstruct the conduit runs as required, and all costs in connection with such removal and relocation shall be borne by the Contractor.

L. Exposed conduit stubbing up through floor slab into bottom of exposed panels, cabinets or equipment shall be lined up, properly spaced and shall be straight and plumb. Conduits shall be installed at sufficient depth below slab to eliminate any part of the bend above top of slab. All conduit stubups shall be wrapped with tape from a point 2 inches

below the top of slab, to at least 3 inches above slab. Tape shall be removed after slab has been cured.

M. All public telephone conduit runs shall be installed with long radius sweeps, and no factory “ails” shall be permitted. Conduit shall be installed in a manner satisfactory to the Telephone Company Engineers.

N. The joints of all underground conduits shall be liquid and gas tight. Size shall be pulled through each non-metallic conduit 2 inches and larger. The mandrel shall have a leather or rubber gasket slightly larger than the duct hole. This test shall be made within 2 hours after concrete envelope has been poured. The job inspector shall witness this test and shall so state in his report. A steel cable (3/8-inch diameter minimum) shall be fastened to both ends of the mandrel and mandrel shall be repulled through the conduit in the opposite direction.

3.2 ABOVE GROUND CONDUIT INSTALLATION

A. Rigid Steel and intermediate Metal Conduit (IMC):

1. Rigid steel conduit shall be used where subject to mechanical injury, where installed in concrete, where used exposed on exterior work and where installed exposed on interior work below 8 feet or where suspended IMC may be used in lieu of standard weight rigid steel conduit in all cases except for above ground conduits containing conductors operating at over 600 volts.

2. Only rigid steel conduit shall be used above grade for 601 volt and higher circuits.

B. Electrical Metallic Tubing (Steel Tube):

1. Electrical metallic tubing may be used for all interior above ground applications except where noted to be rigid steel or flexible conduit in these Specifications or as noted otherwise on the drawings. All EMT shall have UL label.

2. EMT may be used where installed in floor slab of multi-story construction other than in slab on grade.

C. Flexible Steel Conduit:

1. Flexible steel conduit shall be used only where noted on the drawings, where required for connection to motors, etc., or with the approval of the Architect, where absolutely necessary due to structural conditions.

2. Plastic coated flexible metallic conduit (Sealtite), complete with proper fittings, shall be used in lieu of regular flexible conduit in all areas subject to moisture, dampness, rain, in excessively dusty or dirty areas; where subjected to constant personnel contact; for connections to all kitchen equipment; for connections to all shop equipment and where specifically called for on the drawings.

3. Flexible aluminum conduit shall be used.

D. PVC Conduit

1. PVC conduit shall not be used above grade except where it is specifically indicated otherwise herein or noted on the drawings. All riser ELLS (as well as all conduit extensions) from PVC systems exposed or extended into masonry walls shall be rigid steel. All other riser ELLS extending into concealed areas above grade from underground PVC may be EMT or rigid steel at the Contractor's option. The underground portion of all steel ELLS shall be encased in concrete.

2. Connections, bending, cutting and installation shall be as recommended by the manufacturer.

E. Rigid Aluminum Conduit shall not be used.

1. All conduit of every type, used for electrical systems of 110 volts to ground or higher, shall have a copper ground wire installed therein. See Section under Grounding for sizing of ground wire. Conduit fill shall include the ground wire in all cases. See **Section 260533**.

F. Conduit shall be concealed, unless otherwise indicated. All conduit runs exposed to view, except those in attic spaces, shall be installed parallel, or at right angle to structural members, walls, or liens of the building.

G. Conduit shall be kept at least 6 inches from the covering on hot water and steam pipes, and 18 inches from the covering on flues and breaching. The open ends of all conduit shall be kept closed with approved conduit seals during the construction of the building. Use approved conduit unions where union joints are necessary. Running threads will not be permitted.

H. Conduit bends, other than factory ELLS, shall have radius of not less than 10 times the internal diameter of the conduit.

1. 1 inch and small conduits above metal lath ceilings or other non-accessible ceiling supported on channels shall be tied to the ceiling channels. 1-1/4 inch and larger conduits above such ceilings shall be suspended with pipe hangers or pipe racks or shall be secured to no more than 5 feet apart and shall hold the conduit tight against the channels and studs at the point of tie. Tie wire shall be 16 gauge galvanized double annealed tie wire.

I. Conduits 1 inch and small above suspended modular ceilings such as the tee bar, duo flex and similar ceiling systems shall be supported with spring steel clips, manufactured for that specific purpose, from the ceiling suspension wires or from separate wires provided specifically for conduit suspension. Support and attachment shall reasonably restrict lateral movement as well as provide vertical support. Conduits and attachments shall be placed so as not to interfere with upward displacement of removable ceiling tile.

J. Outlet boxes above accessible suspended ceilings, except in hospitals and other buildings subject to OSHPD approval, may be supported by devices manufactured for the purpose from the main ceiling members if they are placed so that they do not interfere

with either the installation of recessed lighting fixtures or the removal of ceiling tile. For hospitals use separate support wires or other approved means.

K. Exterior conduits 1 inch or smaller below 8 feet and exposed to the public shall be rigid metal. All conduits on flat roofs or under covered walks shall be rigid metal. Strut straps are the preferred method of strapping.

L. Conduit in ceiling spaces above ceilings constructed of wood and in wood stud walls shall be supported with factory made pipe straps or shall be suspended with pipe hangers or pipe racks. The pipe straps shall be attached to and shall hold the conduit tight at the point of support against the ceiling rafters and wall studs or to 2 inches by 4 inches headers fitted between the joist or walls studs.

M. Conduit placed against concrete or masonry above ground shall be fastened to the concrete with pipe straps or one-screw conduit clamps attached to the concrete by means of expansion anchors and screws.

N. Pipe hangers for individual conduits shall be factory made, consisting of a pipe ring and threaded suspension rod. The pipe ring shall be malleable iron, split and hinged, or shall be springable wrought steel. Rings shall be bolted to or interlocked with the suspension rod socket. Rods shall be 3/8 inch for 2 inches conduit hangers and smaller and shall be ½ inch for 2-1/2 inches conduit hangers and larger.

O. Pipe racks for groups of parallel conduits shall be constructed of unistrut (or similar material) of length as required, suspended on threaded rods and secured thereto with nut above and below the cross bar. All conduits shall rest on the cross bar and shall not be stacked one on top of the other. Conduits may be tiered on the same hanger provided that additional cross bars are installed.

P. Hanger straps, rods, or pipe supports under concrete shall be attached to inserts set at the time the concrete is poured. Under wood use bolts, lag bolts, or lag screws; under steel joists or trusses use beam clamps.

Q. Conduits which are suspended on rods more than 2 feet long shall be rigidly braced to prevent horizontal motion or swaying.

R. Factory made pipe straps shall be one-hole malleable iron or two-hole galvanize clamps.

S. Conduit shall be supported at intervals not exceeding 10 feet and in all cases with support not more than 3 feet from the outlet and at any point where it changes in direction. Perforated strap and plumber’s-tape shall not be used in the support of conduits.

T. All conduits which are installed at this time and left empty for future use or where conductors are to be installed by the representative of the signal system manufacturer shall have a No. 12 “TW” insulated, copper pull wire or 1/8-inch polyethylene rope left in place for future use. All empty conduits, including conduit stubs, shall be tagged at all exposed ends with brass tags marked as shown on the drawings or directed by the Architect’s representative.

U. Where conduit passes from one type of construction to another, or where there is a possibility of dissimilar movements, a suitable flexible or expansion device shall be installed.

V. Where conduit is shown run in floor slab of multi-story construction, the conduit shall be run in the slab. If, due to structural steel or slab thickness, the conduit cannot run in the slab, it shall be suspended below the slab on hangers as directed by the Architect. All exposed conduits shall be run at right angles or parallel to structural members.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The requirements of this section are in addition to the requirements of Division 1, General Conditions and Supplementary Conditions.

1.2 SUMMARY

A. Scope: Furnish all labor, materials, equipment and incidentals required, and install overcurrent protective devices as shown on the Drawings and as required to protect all circuits in strict accordance with applicable Electrical Code(s). Overcurrent protective devices may be required as a component of disconnect switches, transformers, motor starters, switchboards, panelboards or mechanical equipment.

B. Related Work Specified Elsewhere:

1. Section 260000, GENERAL REQUIREMENTS, ELECTRICAL
2. Section 260533.13, CONDUITS AND FITTINGS
3. Section 261200, CONDUCTORS
4. Section 260533, BOXES AND ENCLOSURES
5. Section 260943, MOTOR STARTERS
6. Section 262600, DISCONNECT SWITCHES
7. Section 260526, GROUNDING
8. Section 261200, TRANSFORMERS
9. Section 260620.16, PANELBOARDS
10. Section 265000, LIGHTING
11. Section 260650.16, LIGHTING CONTROL SYSTEM

1.3 QUALITY ASSURANCE

A. All overcurrent protective devices shall comply with applicable standards of the Underwriter’s Laboratories. Circuit breakers and other devices shall be UL labeled.

PART 2 - PRODUCTS

2.1 CIRCUIT BREAKERS

A. Circuit breakers shall be of the proper type and rating for each application. They shall be molded case, thermal-magnetic, with inverse time characteristic response - temperature compensated. The fault current interrupting rating shall not be less than that shown on the Drawings (10,000 ASYM minimum). Series rated circuit breaker combinations are not acceptable to meet required fault current interrupting ratings. Panelboard circuit breakers shall be **"bolt on**" type unless noted otherwise. Multiple pole circuit breaker must be manufactured as a single unit - single pole units with handles "bailed" together will not be acceptable. Use of "tandem" circuit breakers or "two in the space normally occupied by one" will not be acceptable.

B. Circuit Breakers shall match panelboards.

C. Enclosed circuit breakers shall be as indicated on the Drawings and as required by applicable Electrical Code. The enclosures shall have been manufactured specifically for the type of circuit breaker provided and shall be UL listed. Use NEMA 1 enclosures dry indoors areas and NEMA 3R/12 (rain and dust tight) in outdoor areas.

2.2 FUSES

A. Fuses shall be provided for all fuse holders as shown on the Drawings and specified herein. They shall be current-limiting, non-renewable as indicated on the Drawings - Fusetron or Limitron type manufactured by Bussman or equal. Provide three (3) spare fuses for each size and class of fuse used.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Circuit breakers and fuses are to be installed in accordance with manufacturer's instructions. Fuses must seat solidly with all contact surfaces bearing evenly. Replace warped, weak, or broken fuse clamp terminals. Do not attempt to repair or bend back into position. Fuse adapters shall not be allowed.

B. HACR rated circuit breakers shall be provided to protect all feeders and branch circuits to non-fused HVAC and refrigeration equipment and where required by equipment listing conditions.

C. Switch duty rated circuit breakers are to be provided where circuit breakers will be used to control the connected loads.

D. Enclosed circuit breakers are to be installed plumb and rigidly secured to structure or equipment with wood screws, bolts and expansion anchors, or machine bolts and locknuts as applicable. Nameplates shall be installed as indicated in Section 260000, General Requirements, Electrical.

E. Test circuit breakers and ground fault devices when required by the local utility company or building code.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The requirements of this section are in addition to the requirements of Division 1, General Conditions and Supplementary Conditions.

1.2 SUMMARY

A. Scope: Wiring devices are to be provided and installed as indicated on the Drawings and as described in the Specifications

B. Related Work Specified Elsewhere:

Section 260000, GENERAL REQUIREMENTS, ELECTRICAL
Section 260533.13, CONDUITS and FITTINGS
Section 260519, CONDUCTORS
Section 260533, BOXES AND ENCLOSURES
Section 260533.16, FLOOR BOXES
Section 265000, LIGHTING

1.3 QUALITY ASSURANCE

A. All wiring devices shall comply with applicable standards of the Underwriter's Laboratories.

PART 2 - PRODUCTS

2.1 WALL SWITCHES

A. Specification grade 20A, 120/277 Volt, UL listed rated "AC" and quiet type. Color selected by the Architect. Provide key type where shown on the Drawings.

B. Schedule of Approved Types:

SWITCH TYPE	LEVITON	P&S INDUSTRIAL EXTRA HEAVY DUTY	HUBBELL
Single Pole	121-21	PS20AC11	12211
Double Pole	1222-1	PS20AC21	12221
Three Way	1223-21	PS20AC31	12231
Four Way	1224-21	PS20AC41	12241
SP LOCK	1221-2IL	PS20AC1IL	
DP LOCK	1222-2IL	PS20AC2IL	
3-WAY LOCK	1223-2IL	PS20AC3IL	

4-WAY LOCK	1224-2IL	PS20AC4IL

MAINTAINED CONTACT	LEVITON	P&S INDUSTRIAL EXTRA HEAVY DUTY	HUBBELL
SPDT 3-POS	12851	12251	1385
DPDT 3-POS	1286-1	12261	1386
DPDT 2-POS		1276	
SPDT 3-POS LOCK	1285-L	1225L	
DPDT 3-PO LOCK	1288-LI	1226L	

MOMENTARY CONTACT	LEVITON	P&S INDUSTRIAL EXTRA HEAVY DUTY	HUBBELL
SPDT 3-POS	1257-1	12511	1557
DPDT 3-POS		12561	
SPDT 3-POS LOCK	1257-IL	1251L	
DPDT 3-POS LOCK	1262-LI	1256L	

MOTOR RATED	LEVITON	P&S INDUSTRIAL EXTRA HEAVY DUTY	HUBBELL
NO OVERLOAD SINGLE PHASE			
SINGLE POLE SINGLE PHASE		PS20AC2HP	
DOUBLE POLE SINGLE PHASE		PS30AC2HP	

2.2 RECEPTACLE OUTLETS

A. Receptacle construction shall include “rivetless” construction in the primary power and ground path, all brass mounting strap, brass power terminal, brass ground screws and ground blades having maximum flat (not edge) contact surface area with the “sides” of the U Ground plug blade. Color selected by the Architect.

SCHEDULE OF APPROVED TYPES	LEVITON	P&S INDUSTRIAL EXTRA HEAVY DUTY	HUBBELL
20 AMP DUPLEX BACK & SIDE WIRED	TBR20-I	5362AI	5362
20 AMP DUPLEX HARD USE COMM. TAMPER RESISTANT		TR53621	
20 AMP 125V, GFI			IG5362

SCHEDULE OF APPROVED TYPES	LEVITON	P&S INDUSTRIAL EXTRA HEAVY DUTY	HUBBELL
20 AMP 125V, ISOLATED GROUND	T7899-HGI		GF5352
20 A SINGLE REC TAMPER RESISTANT	5261	TR52561	
20 A DUPLEX REC ISOLATED GRD TAMPER RESISTANT	5262-IGI	TRIG5326I	
20A SPEC GRADE GFI TAMPER RESISTANT		2095TRI	
20A WEATHER RESISTANT GFI	WT599	2095TRWRI	
20A DUPLEX DECORA HEAVY DUTY TAMPER RESISTANT	16352-1	TR263621	

2.3 COVER PLATES

A. All cover plates shall be nylon, unless otherwise noted. Other materials and styles are specified in Section 26 0533, Boxes and Enclosures. Plastic cover plates on wiring devices located in finished and high abuse areas are prohibited from use.

B. Plates shall be provided which have been manufactured specifically to fit the devices specified and in the locations indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Except where otherwise indicated or dictated by structural constraints and approved the Architect, install all wall switches and outlets vertically and at the locations and heights indicated. Devices shall be securely installed in boxes suitable to the conditions and as indicated in this Division and on the Drawings.

B. Cover plates shall fit over the devices precisely. They shall be set vertically (or horizontally where indicated) within 1/16 inch over the length of the major dimension. The plates shall be in continuous contact with the wall surface all around and completely cover the wall opening. Use of oversized plates shall not be permitted except where specifically authorized by the Architect.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide electrical connections to various equipment. Such equipment includes motors, kitchen equipment, owner furnished equipment, etc. that is specified in other divisions of this specification. In addition, provide all controls and instrumentation as shown and specified.

1.2 WORK NOT INCLUDED UNDER THIS SECTION

A. Temperature control conduit and wiring included under Divisions 22 PLUMBING and 23 MECHANICAL, except as otherwise specified hereinafter.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. As specified in Section 26 05 00, BASIC ELECTRICAL MATERIALS AND METHODS.

B. COMBINATION LOAD EQUIPMENT: Provide overcurrent protection for multi-motor and combination load equipment in conformance with U.L. requirements. Provide overcurrent protective device in accordance with manufacturer's data plate attached to equipment actually installed whether shown or not without an increase in Contract Sum.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide all conduit and wiring from panelboards and/or the overcurrent protective device to kitchen, mechanical, owner furnished, and other equipment and make connection to equipment, motors, VFD's, and associated control apparatus as specified in the individual specification sections.

B. Provide connections to starters, variable frequency drives, controllers, and other related equipment for various motor units requiring electrical connection that is supplied as part of the work of other sections. Include the necessary anchors, sleeves, and similar items to facilitate proper installation of the system.

C. Check and verify locations of all power operated devices and their related controls; coordinate with the work of other sections, and provide required overload protection, circuit and control conductors (except temperature controls) to each and all locations. Do not proceed with work without first verifying the accuracy of data.

D. TEMPERATURE CONTROL CONDUIT AND WIRING: Provided as part of the work of Divisions 22 PLUMBING and 23 MECHANICAL, including all interlock wiring between motor starter and temperature control equipment; however, if a device such as pneumatic electric relay is used as a motor starter on a branch circuit run, provide and connect branch circuit to device and from this device to motor. Provide control wiring between starters and pushbuttons or other manual starter switches and branch circuit power supply required for temperature control system.

E. WIRING: Except for temperature control wiring, encompass the correct installation of all overload protection, control wiring and adequate power supply, and proper operation of all electrical equipment associated with the mechanical equipment.

1. The responsibility for correctness of electrical connections and protective devices described hereinbefore, for operation of equipment furnished, installed, or modified as part of the work of other sections shall be that of the other sections.

2. Before permitting operation of any equipment which is furnished, installed, or modified under work of other sections, review all wiring connections which have an influence on equipment of work, and verify that these connections are correct. Ensure that overload protection devices installed are of correct type, rating and setting to properly protect said equipment.

3. Provide and install branch circuits and switches. Connect every electrical load wherever shown.

3.2 OVERLOAD PROTECTION

A. When not furnished as part of the work of other sections as part of packaged mechanical equipment units or as a separate magnetic starter, include thermal overload protection as follows:

1. For all motors 1/8 horsepower and larger that are controlled manually except as shown.

2. For all motors 1/30 horsepower and larger that are controlled automatically by means of such devices as thermostats, aquastats, time switches, pressure switches, float switches or other similar devices.

3. For all motors 1/30 horsepower and larger that are controlled manually out of sight of controller or more than 50 feet away.

4. Install proper thermal protection and disconnects in accordance with applicable CEC requirements for motors.

END OF SECTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work specified in this Section.

PART 2 - PRODUCTS AND EXECUTION

2.1 DISCONNECT SWITCHES

A. Disconnect switches shall be 600 volt A.C., as required, NEMA Type HD, quick make, quick break, horsepower rated, non-fusible or fusible switches in NEMA Type I enclosure with number of poles and amperage as indicated on the drawings. Where enclosure is indicated W.P . (weatherproof) switches shall be in raintight NEMA Type 3R enclosure. Disconnect switches shall be complete with padlockable door and door interlock that prevents the door from being opened unless the operating handle is in the "off" position. The operating handle shall be lockable in the closed and open positions. Fuses shall be NEMA Class K-5, dual element, time delay, current-limiting type.

2.2 INDIVIDUAL CIRCUIT BREAKER

A. Individual circuit breaker shall be installed in NEMA I enclosure of size and number of poles as shown on the drawings. Where enclosure is indicated W.P. (weatherproof) on the drawings, circuit breakers shall be in a raintight NEMA Type 3R enclosure. Breaker shall be 22,000 AIC symmetrical for 240 volts. Circuit breakers shall be manufactured by Westinghouse, General Electric and Square D.

B. All circuit breakers shall be U.L labeled as suitable for use with 60 degree/75 degree C or 75 degree C rated conductors.

2.3 TERMINAL CABINETS

A. Terminal cabinets shall be fabricated of sheet steel for flush or surface mounting of size indicated on the drawings and shall be complete with hinged lockable doors (except public telephone terminal cabinets - these shall be with non-lockable latches), index card holders and the number of terminals as indicated on the drawings or as specified hereinafter. Terminals shall be as hereinafter specified in another section under this Division of the Specifications. Cabinets shall be constructed and finished identical to panelboards. A ½ inch Duraply backing shall be furnished in all terminal cabinets. Terminal cabinets shall be furnished with locks keyed the same as the panelboards. Terminal cabinets shall be manufactured by the same manufacturer as the panelboards.

2.4 TIME SWITCH

A. The electronic time switch shall be a solid state digital type capable of distributing set points on independent daily schedules throughout a seven (7) day time period with Astro and momentary feature for all circuits. The time switch shall provide for five (5) weekday programming, two (2) weekend day programming or all seven (7) day programming to simplify program entry for typical 5/2 day load control. A copy feature shall be provided for duplicating full daily schedules where the 5/2 day scheduling is not applicable. The time and set points shall be programmable to the nearest minute with a minimum ON duration of 1 minute and a maximum of six (6) days, 23 hours and 59 minutes. The time switch shall have a digital LED readout and prompt LEDs for each function to further simplify program entry. Each load control shall include an ON/OFF pushbutton, an ENABLE/DISABLE switch and an LED load status indicator. The time switch shall provide an operating temperature range of -40 degrees F (-40 degrees C) to 122 degrees F (50 degrees C). Time switch shall be certified under Title 24 Part 6. Section 131 (D) of the California code regulation. Time switch shall have fully automatic daylight saving adjustment, with user selectable override, and automatic leap year adjustment. It shall be the contractor's responsibility to furnish the units with the proper voltage and quantity of circuits as indicated on the drawings. Time switch shall retain its programing during power failures. The time switch shall keep the proper time during power outages.

B. Electronic time switch (time clock) shall be manufactured by Intermatic Next Generation GT70X15CRX.

2.5 PHOTOELECTRIC CONTROL (PHOTOCELL)

A. Photocell shall be flush, outlet box mounting, weatherproof; stainless steel plate; rated for 1000 watt load at 120 volts, Tork Catalog No. 3010.

B. Photocell shall be outdoor, weatherproof, in surface, cast box. Contact ratings, 2000 watt load at 120 or 208/277 volts. Operating level adjustable from two (2) footcandles to 50 footcandles. Control shall be Tork Catalog No. 2101 (120 volt) or 2104 (208/277 volt). [Take note that this photocell has an integral ½ inch threaded (male) connector at one (1) end of the cast box and this is its only method of mounting.]

END OF SECTION