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

ADDENDUM NO. 0A

Date: 05/07/2022

Issued by: Sacramento City Unified School District

Project: **Bid No 455-2B**
Shade Structures at Various Sites Group 2B

This addenda shall supersede the original Information, attachments, and specifications regarding Bid No.**455-2B** 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

AD0A.01 The Bid Date has been changed from May 12th, 2022, at 2:00 PM to May 16th, 2022 at 2:00 PM.

AD0A.02 Refer to Document 00 00 03, SEALS PAGE for DSA#: 02-120000, 02-120002, 02-120006 & 02-120007

Replace four (4) Seals pages in their entirety with Attachment AD0A.19.

- DSA Approval Stamp Added

AD0A.03 Refer to Document 00 01 10 TABLE OF CONTENTS, Division 26 – Electrical:

Revise Spec Section Number to read as follows:

26 0510 ELECTRICAL BASIC MATERIALS AND METHODS

AD0A.04 Refer to Document 00 01 15, LIST OF DRAWINGS, Mark Twain ES Drawings – DSA # 02-120006:

Add C3.1 DETAILS AND SECTIONS

AD0A.05 Refer to Document 00 01 15, LIST OF DRAWINGS, Mark Twain ES Drawings – DSA # 02-120006:

Revise the TOTAL SHEET COUNT to read as follows:

TOTAL SHEET COUNT: 15

AD0A.06 Refer to Document 00 01 15, LIST OF DRAWINGS, Page 4:

Revise the Heading at top of page to read as follows**:**

Rosa Parks MS Drawings – PC 04-120013 Continued

Bid Number 455-2B
Shade Structures at Various Sites Group 2B
ADDENDUM NO. 0A

AD0A.07 Refer to Document 00 11 16, NOTICE TO BIDDERS:

REVISE Item 6 to read as follows:

Bids should be submitted electronically through e-Builder. The bids will be received until **2:00 P.M. on 5/16/22**. At or after which time the bids will be opened privately due to the COVID-19 pandemic. Bid tabulation will be posted within one hour of the bid deadline in the e-Builder Bid Documents and at www.scusd.edu/construction-projects-bids.

AD0A.08 Refer to Document 00 21 13 INSTRUCTIONS TO BIDDERS, Item 4:

REVISE Paragraph b to read as follows:

b. Bids must be submitted to the District via e-builder at https://bidders.e-builder.net/landing?bidpackageid=0ff7e68d-f0e3-435e-b6c7-1a2b06d168ce by date and time shown in the Notice to Bidders

AD0A.09 Refer to Exhibit D – DSA 103 Structural Test & Inspection Requirements:

Replace Placeholder page with DSA Approved 103s for all four (4) sites. Attachment AD0A.20

Part B – TECHNICAL REQUIREMENTS

AD0A.10 Refer to Project Manual, Shade Structures at Various Sites Group 2B:

Add All the following technical specifications listed below. Attachment AD0A.21**:**

05 5000 METAL FABRICATIONS
10 1400 SIGNAGE
10 2116 PLASTIC TOILET COMPARTMENTS
10 2813 TOILET ACCESSORIES
26 0510 ELECTRICAL BASIC MATERIALS AND METHODS
31 0000 EARTHWORK
31 2333 TRENCHING AND BACKFILLING
32 1200 ASPHALT CONCRETE PAVING
32 1600 SITE CONCRETE
33 4000 STORM DRAINAGE UTILITIES

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Part C - DRAWINGS

AD0A.11 Refer to Earl Warren ES Drawings - DSA# 02-120000 & PC 04-120013 Plan Sets:

REPLACE All Drawing Sheets listed below in their entirety. Attachment AD0A.22

- Replace Sheets w/ DSA Approved

Earl Warren ES Drawings – DSA # 02-120000

Sheet#	Description
GENERAL	
A0.1	COVER SHEET
A0.2	TYPICAL MOUNTING HEIGHTS AND DETAILS
A0.7	LOCAL FIRE AUTHORITY SITE PLAN
CIVIL	
C0.1	CIVIL GENERAL NOTES AND ABBREVIATIONS
C1.1	DEMOLITION PLAN
C2.1	GRADING AND PAVING PLAN
C3.1	DETAILS AND SECTIONS
ARCHITECTURAL	
A1.1.0	SITE PLAN AND CODE INFORMATION
A1.1.1	PARTIAL SITE PLANS AND DETAILS
A2.1.1	TOILET ROOM DEMOLITION AND IMPROVEMENT PLANS AND INTERIOR ELEVATIONS
ELECTRICAL	
E0.1	SYMBOLS, NOTES
E1.1	SITE PLAN – ELECTRICAL
E2.1	ONE LINE DIAGRAM
E3.1	DETAILS

TOTAL SHEET COUNT: 14

Earl Warren ES Drawings - PC 04-120013

Sheet#	Description
LS1.0	GENERAL INFO
LS1.1	DSA 103
LS3.0	30' WIDE RECTANGULAR HIP FOUNDATION PLAN
LS3.1	30' WIDE RECTANGULAR HIP FRAMING & CONNECTION DETAILS
LS3.4	30' WIDE RECTANGULAR HIP STANDING SEAM ROOFING PLAN
LS5.0	ELECTRICAL ACCESS

TOTAL SHEET COUNT: 6

AD0A.12 Refer to Earl Warren ES Drawings PC 04-120013 Plan Set:

Add Statement of General Conformance – Attachment AD0A.23

AD0A.13 Refer to Elder Creek MS Drawings – DSA# 02-120002 & PC 04-120013 Plan Sets:

REPLACE All Drawing Sheets listed below in their entirety. Attachment AD0A.22

- Replace Sheets w/ DSA Approved

Elder Creek MS Drawings – DSA # 02-120002

Sheet#	Description
GENERAL	
A0.1	COVER SHEET
A0.2	TYPICAL MOUNTING HEIGHTS AND DETAILS
A0.7	LOCAL FIRE AUTHORITY SITE PLAN
CIVIL	
C0.1	CIVIL GENERAL NOTES AND ABBREVIATIONS
C1.1	DEMOLITION PLAN
C2.1	GRADING AND PAVING PLAN
ARCHITECTURAL	
A1.1.0	SITE PLAN AND CODE INFORMATION
A1.1.1	PARTIAL SITE PLANS AND DETAILS
A2.1.1	TOILET ROOM DEMOLITION AND IMPROVEMENT PLANS AND INTERIOR ELEVATIONS
ELECTRICAL	
E0.1	SYMBOLS, NOTES
E1.1	SITE PLAN – ELECTRICAL
E2.1	ONE LINE DIAGRAM
E3.1	DETAILS

TOTAL SHEET COUNT: 13

Elder Creek MS Drawings - PC 04-120013

Sheet#	Description
LS1.0	GENERAL INFO
LS1.1	DSA 103
LS3.0	30' WIDE RECTANGULAR HIP FOUNDATION PLAN
LS3.1	30' WIDE RECTANGULAR HIP FRAMING & CONNECTION DETAILS
LS3.4	30' WIDE RECTANGULAR HIP STANDING SEAM ROOFING PLAN
LS5.0	ELECTRICAL ACCESS

TOTAL SHEET COUNT: 6

AD0A.14 Refer to Elder Creek MS Drawings PC 04-120013 Plan Set:

Add Statement of General Conformance – Attachment AD0A.23

AD0A.15 Refer to Mark Twain ES Drawings – DSA# 02-120006 & PC 04-120013 Plan Sets:

REPLACE All Drawing Sheets listed below in their entirety. Attachment AD0A.22

- Replace Sheets w/ DSA Approved
- Add DSA Approved Sheet C3.1 DETAILS AND SECTIONS

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Mark Twain ES Drawings – DSA # 02-120006

Sheet#	Description
GENERAL	
A0.1	COVER SHEET
A0.2	TYPICAL MOUNTING HEIGHTS AND DETAILS
A0.7	LOCAL FIRE AUTHORITY SITE PLAN
CIVIL	
C0.1	CIVIL GENERAL NOTES AND ABBREVIATIONS
C1.1	DEMOLITION PLAN
C2.1	GRADING AND PAVING PLAN
C3.1	DETAILS AND SECTIONS
ARCHITECTURAL	
A1.1.0	SITE PLAN AND CODE INFORMATION
A1.1.1	PARTIAL SITE PLANS AND DETAILS
A2.1.1	TOILET ROOM DEMOLITION AND IMPROVEMENT PLANS AND INTERIOR ELEVATIONS
A5.1.1	INTERIOR ELEVATIONS
ELECTRICAL	
E0.1	SYMBOLS, NOTES
E1.1	SITE PLAN – ELECTRICAL
E2.1	ONE LINE DIAGRAM
E3.1	DETAILS

TOTAL SHEET COUNT: 15

Mark Twain ES Drawings - PC 04-120013

Sheet#	Description
LS1.0	GENERAL INFO
LS1.1	DSA 103
LS3.0	30' WIDE RECTANGULAR HIP FOUNDATION PLAN
LS3.1	30' WIDE RECTANGULAR HIP FRAMING & CONNECTION DETAILS
LS3.4	30' WIDE RECTANGULAR HIP STANDING SEAM ROOFING PLAN
LS5.0	ELECTRICAL ACCESS

TOTAL SHEET COUNT: 6

AD0A.16 Refer to Mark Twain ES Drawings PC 04-120013 Plan Set:

Add Statement of General Conformance – Attachment AD0A.23

AD0A.17 Refer to Rosa Parks MS Drawings – DSA# 02-120007 & PC 04-120013 Plan Sets:

REPLACE All Drawing Sheets listed below in their entirety. Attachment AD0A.22

- Replace Sheets w/ DSA Approved

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Rosa Parks MS DRAWINGS – DSA # 02-120007

Sheet#	Description
GENERAL	
A0.1	COVER SHEET
A0.2	TYPICAL MOUNTING HEIGHTS AND DETAILS
A0.7	LOCAL FIRE AUTHORITY SITE PLAN
CIVIL	
C0.1	CIVIL GENERAL NOTES AND ABBREVIATIONS
C1.1	DEMOLITION PLAN
C2.1	GRADING AND PAVING PLAN
ARCHITECTURAL	
A1.1.0	SITE PLAN AND CODE INFORMATION
A1.1.1	PARTIAL SITE PLANS AND DETAILS
A2.1.1	TOILET ROOM DEMOLITION AND IMPROVEMENT PLANS AND INTERIOR ELEVATIONS
ELECTRICAL	
E0.1	SYMBOLS, NOTES
E1.1	SITE PLAN – ELECTRICAL
E2.1	ONE LINE DIAGRAM
E3.1	DETAILS

TOTAL SHEET COUNT: 13

Rosa Parks MS Drawings - PC 04-120013

LS1.0	GENERAL INFO
LS1.1	DSA 103
LS3.0	30' WIDE RECTANGULAR HIP FOUNDATION PLAN
LS3.1	30' WIDE RECTANGULAR HIP FRAMING & CONNECTION DETAILS
LS3.4	30' WIDE RECTANGULAR HIP STANDING SEAM ROOFING PLAN
LS5.0	ELECTRICAL ACCESS

AD0A.18 Refer to Rosa Parks MS Drawings PC 04-120013 Plan Set:

Add Statement of General Conformance – Attachment AD0A.23

Part D- BIDDERS QUESTIONS
(Not Used)

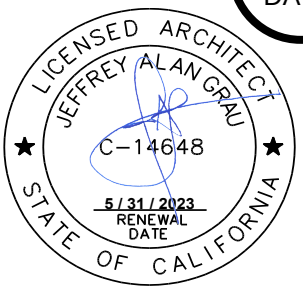
List of Attachments:
AD0A.19 Document 00 00 03 SEALS PAGES with DSA Stamp (4 Pages**)**
AD0A.20 DSA Approved 103s for all four sites (76 Sheets)
AD0A.21 Technical Specifications 05 5000 thru 33 4000 (109 Pages)
AD0A.22 DSA Approved Plans for all four (4) sites (79 Sheets)
AD0A.23 Statement of General Conformance for all four (4) sites (4 Pages)

END OF ADDENDUM NO.0A

Contractor to sign as acknowledgment of receipt and return with Bid:

Signature: _____ Date: _____

Company Name (please print) _____



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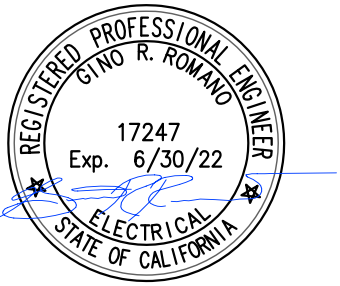

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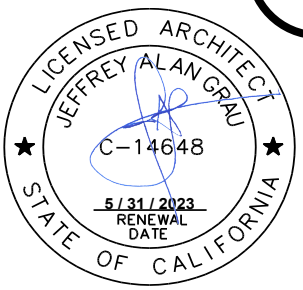
IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-120002 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 04/18/2022



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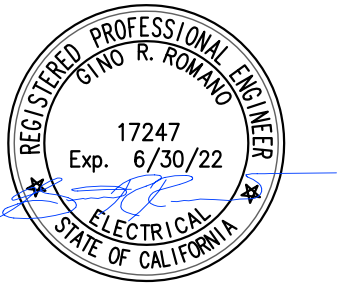

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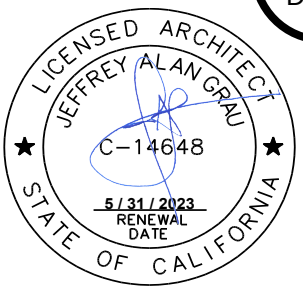

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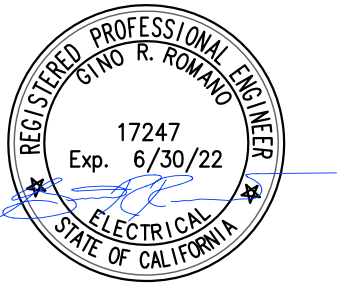

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APP: 02-120007 INC:
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DATE: 04/18/2022

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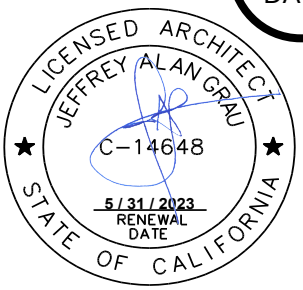

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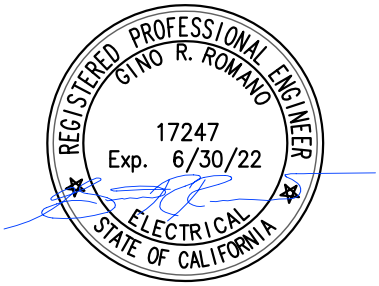

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2019 CBC

Application Number:	School Name:	School District:
02-120000	Earl Warren Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:38:57

2019 CBC

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2019 CBC).

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

KEY TO COLUMNS

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

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2019 CBC

Application Number:	School Name:	School District:
02-120000	Earl Warren Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:38:57

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

	1. GENERAL:	Table 1705A.6		
	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.

	2. SOIL COMPACTION AND FILL:	Table 1705A.6		
	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.

	3. DRIVEN DEEP FOUNDATIONS (PILES):	Table 1705A.7

	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.
☐	**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.

	4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):	**Table 1705A.8**		
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**

☑	**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.		

	5. 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 2 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 16-3.
☐	**d.** Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
☐	**e.** Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	6. 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 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 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

Application Number:	**School Name:**	**School District:**
02-120000	Earl Warren Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:38:57

	7. CAST-IN-PLACE CONCRETE			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
Material Verification and Testing:				
☑	**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 318-14 Section 26.6.1.2; DSA IR 17-10. (See Appendix 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 318-14 Sections 26.5 & 26.12.
☑	**d.** Test concrete (f'_c).	**Test**	**LOR**	**1905A.1.15;** ACI 318-14 Section 26.12.
Inspection:				
☑	**e.** Batch plant inspection:	**See Notes**	**SI**	Default of **'Continuous'** per **1705A.3.3**. If approved by DSA, batch plant inspection may be reduced to **'Periodic'** subject to requirements in Section **1705A.3.3.1,** or eliminated per **1705A.3.3.2.** (See Appendix for exemptions.)
☐	**f.** Welding of reinforcing steel.	Provide special inspection per STEEL, Category 19.1(d) & (e) and/or 19.2(g) & (h) below.		

	8. PRESTRESSED / POST-TENSIONED CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):

Application Number:	**School Name:**	**School District:**
02-120000	Earl Warren Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:38:57

	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.**
☐	**c.** Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	**Periodic**	**SI**	**Table 1705A.3 Item 11.** Special inspector to verify specified concrete strength test prior to stressing.
☐	**d.** Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	**Continuous**	**SI**	**1705A.3.4, Table 1705A.3 Item 9;** ACI 318-14 Section 26.13

	9. PRECAST CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect fabrication of precast concrete members.	**Continuous**	**SI**	ACI 318-14 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.

	10. SHOTCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**

☐	**a.** Inspect shotcrete placement for proper application techniques.	**Continuous**	**SI**	**1705A.19, Table 1705A.3 Item 7, 1908A.6, 1908A.7, 1908A.8, 1908A.9, 1908A.11, 1908A.12.** See ACI 506.2-13 Section 3.4, ACI 506R-16.
☐	**b.** Sample and test shotcrete (f'_c).	**Test**	**LOR**	**1908A.5, 1908A.10.**

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

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

	17. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES			
Material Verification and Testing:				
	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 S100-16 Section A3.1 & A3.2, AISI S240-15 Section A3 & A5, AISI S220-15 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.
Inspection:				
☑	**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**).

	18. HIGH-STRENGTH BOLTS: RCSC 2014			
Material Verification and Testing of High-Strength Bolts, Nuts and Washers:				
	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.
Inspection of High-Strength Bolt Installation:				
☐	**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.

	19. WELDING:	**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 (See Appendix for exemptions.)		
Verification of Materials, Equipment, Welders, etc.:				
	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**	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.

	19.1 SHOP WELDING:			
	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.

	19.2 FIELD WELDING:			
	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 S240-15 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.

	20. NONDESTRUCTIVE TESTING: **1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16**			
	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; ANSI/ ASNT CP-189, SNT-TC-1A; 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; ANSI/ ASNT CP-189, SNT-TC-1A; AWS D1.1, AWS D1.8; DSA IR 17-2.
☐	**c.**	**Test**	**LOR**	

	21. STEEL JOISTS AND TRUSSES: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16			
	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.

	22. SPRAY APPLIED FIRE-PROOFING: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16			
	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.14.**
☐	**b.** Test bond strength.	**Test**	**LOR**	**1705A.14.6.**

☐	**c.** Test density.	**Test**	**LOR**	**1705A.14.5.**

	23. 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.

	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:
02-120000	Earl Warren Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:38:57

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 designed based on minimum allowable pressures per CBC Table 1806A.2 and having no geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
☐	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") 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."
☐	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 21-1.16. 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.
☐	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 gates with maximum leaf span or rolling section for rolling gates of 10' and apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
☑	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 19, 19.1 and/or 19.2 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 19, 19.1 and/or 19.2 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 section 19, 19.1 and/or 19.2 located in the Steel/Aluminum category).
☐	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 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2019 CBC

Application Number:	**School Name:**	**School District:**
02-120000	Earl Warren Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:38:57

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

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

Signature of Architect or Structural Engineer:

Date:

04/14/22

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: 02-120000 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 04/19/2022

DSA 103-19: LIST OF REQUIRED VERIFIED REPORTS, CBC 2019

Application Number:	School Name:	School District:
02-120000	Earl Warren Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:38:57

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

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2019 CBC

Application Number:	School Name:	School District:
02-120002	Elder Creek Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:48:48

2019 CBC

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2019 CBC).

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

KEY TO COLUMNS

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

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2019 CBC

Application Number:	School Name:	School District:
02-120002	Elder Creek Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:48:48

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

	1. GENERAL:	Table 1705A.6		
	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.

	2. SOIL COMPACTION AND FILL:	Table 1705A.6		
	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.

	3. DRIVEN DEEP FOUNDATIONS (PILES):	Table 1705A.7

	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.
☐	**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.

	4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):	Table 1705A.8		
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**

☑	**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.		

	5. 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 2 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 16-3.
☐	**d.** Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
☐	**e.** Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	6. 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 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 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

Application Number:	**School Name:**	**School District:**
02-120002	Elder Creek Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:48:48

	7. CAST-IN-PLACE CONCRETE			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
Material Verification and Testing:				
☑	**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 318-14 Section 26.6.1.2; DSA IR 17-10. (See Appendix 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 318-14 Sections 26.5 & 26.12.
☑	**d.** Test concrete (f'_c).	**Test**	**LOR**	**1905A.1.15;** ACI 318-14 Section 26.12.
Inspection:				
☑	**e.** Batch plant inspection:	**See Notes**	**SI**	Default of **'Continuous'** per **1705A.3.3**. If approved by DSA, batch plant inspection may be reduced to **'Periodic'** subject to requirements in Section **1705A.3.3.1,** or eliminated per **1705A.3.3.2.** (See Appendix for exemptions.)
☐	**f.** Welding of reinforcing steel.	Provide special inspection per STEEL, Category 19.1(d) & (e) and/or 19.2(g) & (h) below.		

	8. PRESTRESSED / POST-TENSIONED CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):

	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.**
☐	**c.** Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	**Periodic**	**SI**	**Table 1705A.3 Item 11.** Special inspector to verify specified concrete strength test prior to stressing.
☐	**d.** Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	**Continuous**	**SI**	**1705A.3.4, Table 1705A.3 Item 9;** ACI 318-14 Section 26.13

	9. PRECAST CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect fabrication of precast concrete members.	**Continuous**	**SI**	ACI 318-14 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.

	10. SHOTCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**

☐	**a.** Inspect shotcrete placement for proper application techniques.	**Continuous**	**SI**	**1705A.19, Table 1705A.3 Item 7, 1908A.6, 1908A.7, 1908A.8, 1908A.9, 1908A.11, 1908A.12.** See ACI 506.2-13 Section 3.4, ACI 506R-16.
☐	**b.** Sample and test shotcrete (f'_c).	**Test**	**LOR**	**1908A.5, 1908A.10.**

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

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

	17. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES			
Material Verification and Testing:				
	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 S100-16 Section A3.1 & A3.2, AISI S240-15 Section A3 & A5, AISI S220-15 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.
Inspection:				
☑	**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**).

	18. HIGH-STRENGTH BOLTS: RCSC 2014			
Material Verification and Testing of High-Strength Bolts, Nuts and Washers:				
	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.
Inspection of High-Strength Bolt Installation:				
☐	**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.

	19. WELDING:	**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 (See Appendix for exemptions.)		
Verification of Materials, Equipment, Welders, etc.:				
	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**	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.

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Steel and Aluminum), 2019 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

Application Number:	**School Name:**	**School District:**
02-120002	Elder Creek Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:48:48

	19.1 SHOP WELDING:			
	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.

	19.2 FIELD WELDING:			
	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 S240-15 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.

	20. NONDESTRUCTIVE TESTING: **1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16**			
	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; ANSI/ ASNT CP-189, SNT-TC-1A; 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; ANSI/ ASNT CP-189, SNT-TC-1A; AWS D1.1, AWS D1.8; DSA IR 17-2.
☐	**c.**	**Test**	**LOR**	

	21. STEEL JOISTS AND TRUSSES: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16			
	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.

	22. SPRAY APPLIED FIRE-PROOFING: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16			
	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.14.**
☐	**b.** Test bond strength.	**Test**	**LOR**	**1705A.14.6.**

☐	**c.** Test density.	**Test**	**LOR**	**1705A.14.5.**

	23. 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.

	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:
02-120002	Elder Creek Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:48:48

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 designed based on minimum allowable pressures per CBC Table 1806A.2 and having no geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
☐	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") 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."
☐	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 21-1.16. 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.
☐	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 gates with maximum leaf span or rolling section for rolling gates of 10' and apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
☐	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 19, 19.1 and/or 19.2 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 19, 19.1 and/or 19.2 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 section 19, 19.1 and/or 19.2 located in the Steel/Aluminum category).
☐	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 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2019 CBC

Application Number: 02-120002	**School Name:** Elder Creek Elementary School	**School District:** Sacramento City Unified School District
DSA File Number: 34-53	**Increment Number:**	**Date Created:** 2022-04-13 23:48:48

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

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

Signature of Architect or Structural Engineer:

Date: 04/14/22

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: 02-120002 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 04/18/2022

DSA 103-19: LIST OF REQUIRED VERIFIED REPORTS, CBC 2019

Application Number:	School Name:	School District:
02-120002	Elder Creek Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-13 23:48:48

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

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2019 CBC

Application Number:	School Name:	School District:
02-120006	Mark Twain Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-14 00:03:03

2019 CBC

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2019 CBC).

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

KEY TO COLUMNS

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

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2019 CBC

Application Number:	School Name:	School District:
02-120006	Mark Twain Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-14 00:03:03

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

	1. GENERAL:	Table 1705A.6		
	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.

	2. SOIL COMPACTION AND FILL:	Table 1705A.6		
	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.

	3. DRIVEN DEEP FOUNDATIONS (PILES):	Table 1705A.7

	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.
☐	**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.

	4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):	**Table 1705A.8**		
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**

☑	**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.		

	5. 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 2 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 16-3.
☐	**d.** Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
☐	**e.** Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	6. 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 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 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

Application Number:	**School Name:**	**School District:**
02-120006	Mark Twain Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-14 00:03:03

	7. CAST-IN-PLACE CONCRETE			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
Material Verification and Testing:				
☑	**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 318-14 Section 26.6.1.2; DSA IR 17-10. (See Appendix 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 318-14 Sections 26.5 & 26.12.
☑	**d.** Test concrete (f'_c).	**Test**	**LOR**	**1905A.1.15;** ACI 318-14 Section 26.12.
Inspection:				
☑	**e.** Batch plant inspection:	**See Notes**	**SI**	Default of **'Continuous'** per **1705A.3.3**. If approved by DSA, batch plant inspection may be reduced to **'Periodic'** subject to requirements in Section **1705A.3.3.1,** or eliminated per **1705A.3.3.2.** (See Appendix for exemptions.)
☐	**f.** Welding of reinforcing steel.	Provide special inspection per STEEL, Category 19.1(d) & (e) and/or 19.2(g) & (h) below.		

	8. PRESTRESSED / POST-TENSIONED CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):

	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.**
☐	**c.** Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	**Periodic**	**SI**	**Table 1705A.3 Item 11.** Special inspector to verify specified concrete strength test prior to stressing.
☐	**d.** Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	**Continuous**	**SI**	**1705A.3.4, Table 1705A.3 Item 9;** ACI 318-14 Section 26.13

	9. PRECAST CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect fabrication of precast concrete members.	**Continuous**	**SI**	ACI 318-14 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.

	10. SHOTCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**

☐	**a.** Inspect shotcrete placement for proper application techniques.	**Continuous**	**SI**	**1705A.19, Table 1705A.3 Item 7, 1908A.6, 1908A.7, 1908A.8, 1908A.9, 1908A.11, 1908A.12.** See ACI 506.2-13 Section 3.4, ACI 506R-16.
☐	**b.** Sample and test shotcrete (f'_c).	**Test**	**LOR**	**1908A.5, 1908A.10.**

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

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

	17. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES			
Material Verification and Testing:				
	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 S100-16 Section A3.1 & A3.2, AISI S240-15 Section A3 & A5, AISI S220-15 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.
Inspection:				
☑	**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**).

	18. HIGH-STRENGTH BOLTS: RCSC 2014			
Material Verification and Testing of High-Strength Bolts, Nuts and Washers:				
	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.
Inspection of High-Strength Bolt Installation:				
☐	**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.

	19. WELDING:	**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 (See Appendix for exemptions.)		
Verification of Materials, Equipment, Welders, etc.:				
	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**	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.

	19.1 SHOP WELDING:			
	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.

	19.2 FIELD WELDING:			
	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 S240-15 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.

	20. NONDESTRUCTIVE TESTING: **1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16**			
	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; ANSI/ ASNT CP-189, SNT-TC-1A; 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; ANSI/ ASNT CP-189, SNT-TC-1A; AWS D1.1, AWS D1.8; DSA IR 17-2.
☐	**c.**	**Test**	**LOR**	

	21. STEEL JOISTS AND TRUSSES: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16			
	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.

	22. SPRAY APPLIED FIRE-PROOFING: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16			
	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.14.**
☐	**b.** Test bond strength.	**Test**	**LOR**	**1705A.14.6.**

☐	**c.** Test density.	**Test**	**LOR**	**1705A.14.5.**

	23. 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.

	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:
02-120006	Mark Twain Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-14 00:03:03

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 designed based on minimum allowable pressures per CBC Table 1806A.2 and having no geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
☐	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") 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."
☐	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 21-1.16. 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.
☐	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 gates with maximum leaf span or rolling section for rolling gates of 10' and apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
☐	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 19, 19.1 and/or 19.2 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 19, 19.1 and/or 19.2 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 section 19, 19.1 and/or 19.2 located in the Steel/Aluminum category).
☐	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 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2019 CBC

Application Number:	**School Name:**	**School District:**
02-120006	Mark Twain Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-14 00:03:03

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

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

Signature of Architect or Structural Engineer:

Date:

04/14/22

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: 02-120006 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 04/18/2022

DSA 103-19: LIST OF REQUIRED VERIFIED REPORTS, CBC 2019

Application Number:	School Name:	School District:
02-120006	Mark Twain Elementary School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-14 00:03:03

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

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2019 CBC

Application Number:	School Name:	School District:
02-120007	Rosa Parks Middle School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-14 00:06:22

2019 CBC

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2019 CBC).

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

KEY TO COLUMNS

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

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

	1. GENERAL:	Table 1705A.6		
	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.

	2. SOIL COMPACTION AND FILL:	Table 1705A.6		
	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.

	3. DRIVEN DEEP FOUNDATIONS (PILES):	Table 1705A.7

	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.
☐	**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.

	4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):	Table 1705A.8		
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**

☑	**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.		

	5. 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 2 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 16-3.
☐	**d.** Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
☐	**e.** Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

	6. 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 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 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

Application Number:	**School Name:**	**School District:**
02-120007	Rosa Parks Middle School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-14 00:06:22

	7. CAST-IN-PLACE CONCRETE			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
Material Verification and Testing:				
☑	**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 318-14 Section 26.6.1.2; DSA IR 17-10. (See Appendix 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 318-14 Sections 26.5 & 26.12.
☑	**d.** Test concrete (f'_c).	**Test**	**LOR**	**1905A.1.15;** ACI 318-14 Section 26.12.
Inspection:				
☑	**e.** Batch plant inspection:	**See Notes**	**SI**	Default of **'Continuous'** per **1705A.3.3**. If approved by DSA, batch plant inspection may be reduced to **'Periodic'** subject to requirements in Section **1705A.3.3.1,** or eliminated per **1705A.3.3.2.** (See Appendix for exemptions.)
☐	**f.** Welding of reinforcing steel.	Provide special inspection per STEEL, Category 19.1(d) & (e) and/or 19.2(g) & (h) below.		

	8. PRESTRESSED / POST-TENSIONED CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):

	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.**
☐	**c.** Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	**Periodic**	**SI**	**Table 1705A.3 Item 11.** Special inspector to verify specified concrete strength test prior to stressing.
☐	**d.** Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	**Continuous**	**SI**	**1705A.3.4, Table 1705A.3 Item 9;** ACI 318-14 Section 26.13

	9. PRECAST CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**
☐	**a.** Inspect fabrication of precast concrete members.	**Continuous**	**SI**	ACI 318-14 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.

	10. SHOTCRETE (in addition to Cast-in-Place Concrete tests and inspections):			
	Test or Special Inspection	**Type**	**Performed By**	**Code References and Notes**

☐	**a.** Inspect shotcrete placement for proper application techniques.	**Continuous**	**SI**	**1705A.19, Table 1705A.3 Item 7, 1908A.6, 1908A.7, 1908A.8, 1908A.9, 1908A.11, 1908A.12.** See ACI 506.2-13 Section 3.4, ACI 506R-16.
☐	**b.** Sample and test shotcrete (f'_c).	**Test**	**LOR**	**1908A.5, 1908A.10.**

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

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

	17. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES			
Material Verification and Testing:				
	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 S100-16 Section A3.1 & A3.2, AISI S240-15 Section A3 & A5, AISI S220-15 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.
Inspection:				
☑	**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**).

	18. HIGH-STRENGTH BOLTS: RCSC 2014			
Material Verification and Testing of High-Strength Bolts, Nuts and Washers:				
	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.
Inspection of High-Strength Bolt Installation:				
☐	**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.

	19. WELDING:	**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 (See Appendix for exemptions.)		
Verification of Materials, Equipment, Welders, etc.:				
	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**	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.

	19.1 SHOP WELDING:			
	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.

	19.2 FIELD WELDING:			
	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 S240-15 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.

	20. NONDESTRUCTIVE TESTING: **1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16**			
	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; ANSI/ ASNT CP-189, SNT-TC-1A; 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; ANSI/ ASNT CP-189, SNT-TC-1A; AWS D1.1, AWS D1.8; DSA IR 17-2.
☐	**c.**	**Test**	**LOR**	

	21. STEEL JOISTS AND TRUSSES: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16			
	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.

	22. SPRAY APPLIED FIRE-PROOFING: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16			
	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.14.**
☐	**b.** Test bond strength.	**Test**	**LOR**	**1705A.14.6.**

☐	**c.** Test density.	**Test**	**LOR**	**1705A.14.5.**

	23. 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.

	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:
02-120007	Rosa Parks Middle School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-14 00:06:22

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 designed based on minimum allowable pressures per CBC Table 1806A.2 and having no geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
☐	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") 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."
☐	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 21-1.16. 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.
☐	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 gates with maximum leaf span or rolling section for rolling gates of 10' and apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
☐	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 19, 19.1 and/or 19.2 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 19, 19.1 and/or 19.2 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 section 19, 19.1 and/or 19.2 located in the Steel/Aluminum category).
☐	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 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2019 CBC

Application Number:	**School Name:**	**School District:**
02-120007	Rosa Parks Middle School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-14 00:06:22

Name of Architect or Engineer in general responsible charge:

Jeffrey Grau

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

Signature of Architect or Structural Engineer:

Date:

04/14/22

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: 02-120007 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 04/18/2022

DSA 103-19: LIST OF REQUIRED VERIFIED REPORTS, CBC 2019

Application Number:	School Name:	School District:
02-120007	Rosa Parks Middle School	Sacramento City Unified School District
DSA File Number:	**Increment Number:**	**Date Created:**
34-53		2022-04-14 00:06:22

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

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Railings and handrails.

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 32 1600, Site 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 Welding Society (AWS):

1. A2.4: Standard Symbols for Welding, Brazing, Nondestructive Examination.
2. B2.1/2.1M: Specification for Welding Procedure and Performance Qualification.
3. D1.1/D1.1M: Structural Welding Code – Steel.

D. ASTM International (ASTM):

1. A36/A36M: Standard Specification for Carbon Structural Steel.
2. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. A123/A123M: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
4. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
5. A240/A240M: Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
6. A276A/276M: Standard Specification for Stainless Steel Bars and Shapes.
7. A307: Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
8. A384/A384M: Standard Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies.

9. A385/A385M: Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
10. A500/A500M: Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
11. A554: Standard Specification for Welded Stainless Steel Mechanical Tubing.
12. A575: Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades.
13. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
14. A780/A780M: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
15. A992/A992M: Standard Specification for Structural Steel Shapes.
16. A1008/A1008M: Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
17. A1011/A1011M: Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
18. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

E. Metal Framing Manufacturer's Association (MFMA):

1. Metal Framing Standards Publication.

F. SSPC: The Society for Protective Coatings (SSPC):

1. PA 1: Shop, Field, and Maintenance Painting of Steel.
2. SSPC Guide 15: Field Methods for Extraction and Analysis of Soluble Salts on Steel and Other Nonporous Substrates.
3. Surface Preparation Specifications:
   a. SSPC SP 1: Solvent Cleaning.
   b. SSPC SP 2: Hand Tool Cleaning.
   c. SSPC SP 3: Power Tool Cleaning.
   d. SSPC SP 15: Commercial Grade Power Tool Cleaning.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.

B. Coordination:

1. Miscellaneous metal items embedded in concrete shall be furnished to the respective trades for installation thereunder. Furnish setting templates and/or proper execution of work.

1.5 ACTION SUBMITTALS

A. 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.

1.6 INFORMATIONAL SUBMITTALS

A. Certification for each welder.

B. Sustainable Design:

1. 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.

1.7 QUALITY ASSURANCE

A. Conflicting Requirements: In the event of conflict between the applicable codes and regulations and the requirements of the referenced standards or these Specifications, the provisions of the more stringent shall govern.

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. 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. Welding:

1. Use only qualified welders, certified and qualified in accordance with AWS D1/D1.1M,1o perform types of welding required.
2. All welding to be inspected in accordance with Section 05 1200. Welding inspector's qualifications shall be in accordance with AWS D1.1/D1.1M.
3. Procedures and operations shall comply with AWS B2.1/B2.1M.
4. Comply with most recent edition of AWS publication "Welding Zinc-Coated Steel" for galvanized products.

F. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.8 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.

1.9 FIELD CONDITIONS

A. Products shall be available at project when required for installation so as not to delay job progress. Installer for these products shall cooperate with installers performing work under other Sections involved to effect proper installation.

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. Structural Performance of Railing Assemblies, Handrails, and Guardrails:

1. General:
    a. In engineering stainless steel railing components to withstand structural loads indicated, determine allowable design working stresses of railing materials based on 60 percent of minimum yield strength.
    b. Glass: 25 percent of mean modulus of rupture (50 percent probability of breakage), as listed in "Mechanical Properties" in AAMA's Aluminum Curtain Wall Series CW-12, "Structural Properties of Glass."
2. Handrails and Top Rails of Guards:
    a. Uniform load of 50 pounds/foot applied in any direction.
    b. Concentrated load of 200 pounds applied in any direction.
    c. Uniform and concentrated loads need not be assumed to act concurrently.
3. Infill of Guards:
    a. Concentrated load of 50 pounds applied horizontally on an area of 1 square foot.
    b. Infill load and other loads need not be assumed to act concurrently.

B. Industry Standards:

1. Comply with "Metal Rail Manual" of National Ornamental and Miscellaneous Metals Association (NOMMA).

2. Comply with "Pipe Railing Manual" of National Association of Architectural Metal Manufacturers (NAAMM).

2.2 METAL MATERIALS

A. Steel:

1. Steel Shapes, Plates and Bars: ASTM A36/A36M, unless noted otherwise on plans, except 'W' beams shall conform to ASTM A992/A992M.
2. Sheet: Commercial-quality, cold-rolled, stretcher-leveled, carbon-steel sheet complying with ASTM A1008/A1008M, Class I, matte finish.
3. Hollow Structural Sections (HSS): ASTM A500/A500M, Grade B.
   a. Square and Rectangular: Fy=46 ksi.
   b. Round: Fy= 42 ksi.
4. Pipe: ASTMA53/A53M, Type E or S, Grade B, Fy=35 ksi; hot dipped galvanized unless otherwise indicated or specified.
5. Hot-Rolled Carbon-Steel Bars: ASTM A575, grade as selected by fabricator.

B. Stainless Steel:

1. Alloy: Type 304 at interior, Type 316 at exterior, unless otherwise indicated or specified.
2. Sheet and Plate: ASTM A240/A240M.
3. Bars: ASTM A276/A276M.
4. Tubing for Railings and Guardrails: ASTM A554.
5. Finish on Exposed Surfaces: American Iron and Steel Institute (AISI) No. 4, satin directional brushed, unless otherwise noted.

C. Galvanized-Steel Sheet: ASTM A653/A653M, G90 coating, either commercial steel or forming steel.

2.3 OTHER MATERIALS AND COMPONENTS

A. Bolts and nuts: ASTM A307; machine bolts unless otherwise indicated or specified, galvanized when used with galvanized metal.

B. Drilled-in Concrete Anchors: Hilti "Kwik Bolt TZ2" (ICC Report No. ESR-4266), Ramset T3 (ICC Report No. ESR-1955), or equal.

1. Anchors shall be stainless steel for all exterior work.
2. Testing of anchors is required.

C. Drilled-in Masonry Anchors: Hilti "Kwik Bolt 3 (KB3)" (ICC Report No. ESR-2302), Ramset T3 (ICC Report No. ESR-1955), or equal.

1. Anchors shall be stainless steel for all exterior work.
2. Testing of anchors is required.

D. Fasteners and Connectors:

1. Bolts and Nuts: ASTM A307, Grade A and supplemental S1.
2. Machine Screws: Cadmium plated steel, Fed. Spec. FF-S-92.
3. Wood Screws: Flat-head carbon steel, Fed. Spec. FF-S-111.
4. Plain Washers: Round, carbon steel, Fed. Spec. FF-W-92.
5. Toggle Bolts: Tumbler-wing type, Fed. Spec. FF-B-588, type, class, and style as required.
6. Lock Washers: Helical spring type carbon steel, Fed. Spec. FF-W-84.
7. Lag Bolts: Square head type, Fed. Spec. FF-B-561.
8. Tamper Resistant Fasteners: Snap-off head, or recessed socket for hex wrench with central pin.
9. Security Fasteners: Unless otherwise noted, security screws and bolts shall be minimum 3/8"-20 stainless steel security socket pin requiring special tool; 8 inches on center maximum.

E. Non-Metallic, Non-Shrink Grout: Premixed, conforming to ASTM C1107/C1107M, with minimum compressive strength of 5000-psi at 28-days.

2.4 GALVANIZING

A. Surface Preparation Prior to Galvanizing: In accordance with SSPC Specification SP-5, “Commercial Grade Power Tool Cleaning.”.

B. The following items shall be hot dip galvanized after fabrication into largest practical section in accordance with ASTM A385/A385M:

1. Exterior items including those penetrating an exterior wall and only with partial exposure to exterior.
2. Items embedded in or anchored to concrete at exterior of building even if not directly exposed or visible.
3. Interior Items: Only where noted or specified to be galvanized.

C. Comply with ASTM A153/A153M for galvanizing of iron and steel hardware.

D. Comply with ASTM A123/A123M for galvanizing of assembled steel products and rolled, pressed, and forged-steel shapes, plates, bars, and strips 1/8-inch thick and heavier.

E. Safeguarding against warping and distortion during hot-dip galvanizing of metal fabrications shall be in conformance with ASTM A384/A384M.

F. Weight of zinc coating shall be not less than 2 ounces per square foot of surface.

G. Newly galvanized items shall not be water quenched or chromate quenched after galvanizing if they are scheduled to receive a paint coating.

H. Where damaged, repair surface with specified Galvanized Metal Repair Compound.

2.5 PROTECTIVE COATINGS

A. Products:

1. Galvanizing-Repair Paint: Minimum 95 percent zinc-dust-content in dried film paint for regalvanizing welds in galvanized steel; “Z.R.C. Cold Galvanizing Compound” by ZRC Worldwide, “Cold Galv Primer” by Valspar, or equal. Where repaired galvanizing is to be left exposed, use repair paint that will closely match appearance of hot-dip galvanizing; “Galvilite” by ZRC Worldwide, or equal.
2. Shop Primer for Ferrous Metal - Not Galvanized:
   a. Interior: Modified alkyd; Tnemec Series "FD88 Azeron", or equal.
   b. Exterior: Inorganic, zinc-rich; "Tneme-Zinc 90-97," or equal.
3. Field-Applied Finish Paints: As specified in Section 09 9100, Painting.

B. Galvanized Surfaces:

1. Repair zinc coating damaged after fabrication with specified repair paint in accordance with ASTM A780/A780M, AHDGA publication, "Recommended Practice for Touch-up of Damaged Galvanized Coatings," and manufacturer’s recommendations for application of repair paint.
2. Zinc-coated surfaces to be painted shall be chemically treated and finished painted as specified in Section 09 9100, Painting.

C. Shop Priming:

1. Thoroughly clean steel of all loose mill scale, rust splatter, slag or flux deposits, oil, dirt, and other foreign matter as specified.
2. Stainless steel, surfaces to be epoxy painted, galvanized, or epoxy-coated, surfaces and anchors encased in concrete, surfaces to be grouted against, and surfaces and edges to be field welded shall not be primed, unless otherwise indicated.
3. Soluble Salts: Removal of soluble salts from bare metal is required prior to application of primer coats, to preclude pre-mature coating failure and accelerated corrosion, in accordance with SSPC Guide 15.
4. Surface Preparation Prior to Priming:
   a. Galvanized Surfaces: SSPC No. 1.
   b. Concealed Items: SSPC No. 2 or No. 3.
   c. Exposed Items: SSPC SP 15.

D. After cleaning, except where other finishes are specified, all ferrous metal shall be given one shop coat of specified primer. Parts inaccessible after assembly or erection shall be given two coats of specified primer, second coat darker in color.

1. Primer paint shall be compatible with required finish coat.
2. Apply primer within 8 hours of preparation of surface or sooner if necessary to prevent rusting.

3. Primer shall be applied to a minimum dry film thickness recommended by coating manufacturer.
4. Paint application shall be in accordance with SSPC PA1.

E. Surfaces to be welded shall be protected from painting by use of masking. Inadvertent overspray on surfaces to be welded shall be removed by wire brushing.

F. Finish Painting: As specified in Section 09 9100, Painting. Finish exposed fasteners to match adjacent metal.

2.6 FABRICATION - GENERAL

A. General:

1. Fabrication, material and installation shall be as indicated and as specified. Examine Drawings for additional work required.
2. Angle frames and supports attached to or embedded in concrete construction shall be galvanized after fabrication.

B. Mechanical Connections:

1. Sizes of bolts, screws or other threaded fasteners or anchorage not shown on drawings shall be of size required to meet intended use of item or assembly.

C. Welding:

1. Weld in accordance with recommendations of AWS.
   a. Except where bolted connections are shown, weld all joints and assemblies.
   b. Welds not shown on Drawings shall be designed to meet intended use of item or assembly.
2. Welding shall be done in a sequence, which minimizes distortion and shrinkage.
3. Electrodes preheat and welding process shall meet AWS prequalification requirements and the electrode manufacturer's written recommendations for specific applications.
4. Headed concrete anchors and deformed bar anchors shall be shop welded in accordance with AWS C5.4 and AWS D1.1/D1.1M.
5. Provide additional dressing of welds where specified.
6. Finishing: Provide the following additional requirements and finishing of welds for custom fabricated items where specified.
   a. Mill markings shall be completely removed.
   b. Welds shall be continuous.
   c. Dress exposed and contact surfaces.
   d. Finish exposed surfaces to smooth, sharp, well-defined lines and arris.
   e. Welds, burrs, roller marks, seams, and rough surfaces shall be ground neat and smooth.
   f. Gouges, dents, and other surface abuse shall be filled and ground smooth.

2.7 CUSTOM FABRICATED ITEMS

A. Pipe Handrails: Fabricate and install as indicated, complete with rails, posts, fittings, brackets and anchorage.

1. Wherever practical, construct bends and sweeps by bending pipe. Use suitable pipe bending jigs to prevent crushing pipe. For short radius bends and sweeps, use formed, flush, welding type fittings.
2. Except where bolted connections are indicated, welding shall comply with the specified “Finishing” requirements.
3. Bolts, fasteners, and miscellaneous items at exterior handrails shall be galvanized.

B. Railings: Fabricate from material indicated.

1. Ease corners.
2. Pipe shall be smooth without rough spots, voids or other such imperfections, ready for paint.
3. Welding shall comply with the specified “Finishing” requirements.
4. Bolts, fasteners, and miscellaneous items at exterior railings shall be stainless steel or galvanized.

C. Rough hardware:

1. Provide bent or otherwise custom fabricated bolts, plates, anchors, hanger, dowel, and other miscellaneous steel and iron shapes as required for framing and for anchoring or securing framing to concrete and other structures.

D. Miscellaneous Framing and Supports:

1. Provide miscellaneous steel framing and supports which are not part of structural steel framework, as required to complete work.
2. Fabricate miscellaneous units to sizes, shapes and profiles shown; or if not shown, to require dimensions to receive adjacent other work to be retained by framing.
3. Fabricate the miscellaneous units from structural steel shapes, plates, and steel bars of welded construction with mitered joints for field connection, unless shown otherwise.
4. Cut, drill and tap units to receive hardware.
5. Equip units with integrally welded anchors for casting into concrete or building into masonry, and furnish inserts if units must be installed after concrete is placed.
6. Except as otherwise shown, space anchors 24 inches on center and provide minimum anchor units of 1-1/4 inch x 1-1/4 inch x 8 inch steel straps.
7. Galvanized miscellaneous frames and supports where indicated.

E. Metal backing plates, anchor plates, and similar items required for anchorage of mechanical and electrical fixtures and equipment to metal support framing shall be furnished and installed under the respective framing Section.

2.8 MANUFACTURED ITEMS

A. Handrail Brackets:

1. General:
   a. Provide handrail brackets complete with hanger bolts at locations as indicated on the Drawings.
   b. Secure to solid backing or backing plates as indicated on the Drawings.
   c. Secure to handrail with fasteners in accordance with bracket manufacturer's recommendations.
2. Handrail Brackets with Concealed Fasteners: Julius Blum & Co., Inc. Model No. 378 (curved seat), J.G. Braun Company Model No. 4595 (curved seat), or equal.
   a. Brackets shall be 3-1/4 inch diameter with a curved seat to receive circular railing centered 2-1/2 inches from face of finish wall.
   b. Bracket shall be malleable iron for a painted finish.
3. Finishes:
   a. Channel Supports: Manufacturer’s standard prime paint finish.
   b. Anchors and Fasteners: Galvanized or plated.
   c. Components, fasteners, and anchors at exterior or exposed to weather shall be galvanized with G90 coating.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to all work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where fabrication and installation of the work of this Section may properly commence.

B. Make all required measurements in the field to ensure proper fit of miscellaneous metal items.

C. Verify that miscellaneous metal may be fabricated and installed in strict accordance with the original design and the approved Shop Drawings.

D. In the event of discrepancy, immediately notify the Architect. Do not proceed with fabrication or installation in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

A. Furnish setting drawings, diagrams, templates, instructions and directions for installation of anchorages, such as concrete inserts, anchor bolts, and miscellaneous items having integral anchors, which are to be embedded in concrete construction. Coordinate delivery of such items to project site.

3.3 INSTALLATION – GENERAL

A. Install miscellaneous metals and accessories in accordance with reviewed Shop Drawings, referenced standards, manufacturer's installation recommendations or as directed by Architect.

B. Field Welding: Comply with requirements specified for shop welding and the following.

1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
2. Where specified, grind exposed welded joints smooth and restore finish to match finish of adjacent surfaces.

C. Fastening to In-Place Construction:

1. Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction including threaded fasteners for concrete inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
2. Adhesive anchors shall only be used at concrete block and only at locations where detailed.

D. Cutting, Fitting and Placement:

1. Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications.
2. Set work accurately in locations, alignment and elevations, and make plumb, level, true and free from rack, measured from established lines and levels.
3. Provide temporary bracing or anchors in formwork for items which are to be built into concrete or similar constructions.
4. Fit exposed connections accurately together to form tight hairline joints.
5. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations.
6. Grind exposed joints smooth where specified and touch-up shop paint coat.
7. Do not weld, cut or abrade the surfaces of exterior units which have not been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

E. Provide isolation of dissimilar metals from contact with one another with two coats of primer or accepted equal isolation system.

3.4 INSTALLATION OF RAILINGS

A. Furnish post setting sleeves to concrete trade; direct and supervise proper setting and location of sleeves. Set railing posts and grout between posts and setting sleeves with non-shrink grout.

B. Secure posts and rails to metal with welded or bolted connection.

C. Longitudinal members shall be parallel to each other, to floor surface, or to slope of stairs as shown.

D. Center line of members within each railing run shall be in same vertical plane.

E. Adjust railings prior to securing in place to ensure proper matching at butting joints and correct alignment throughout their length. Plumb posts in each direction. Remove any burrs or protrusions that might snag fingers or clothing, and grind and polish smooth.

F. Handrail Brackets:

1. Secure wall railing brackets to stud wall construction with bolts into backing plates fastened to studs.
2. Space brackets maximum 60 inches on center and 9 inches from end of rails.
3. Return rails to walls at ends.

3.5 TOUCH-UP AND REPAIR

A. Immediately after erection, clean connections including field welds and bolted connections and paint exposed areas with same material used for shop priming. Brush or spray-apply to provide minimum dry film thickness of 2 mils.

B. After installation of this Section is complete, touch-up all damaged and abraded paint on installed assemblies, using paint specified for shop priming.

C. Touch-up damaged areas in shop primed surfaces which will be concealed after erection. Leave in condition fit for finish painting by other trades.

D. Repair or replace defective materials as directed.

E. Adjust and lubricate hardware and leave entire installation clean and in good operating condition.

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. Protect installed work from damage from 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.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Code required signage.
2. Exterior building identification and other non-code signage.

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. Division 26, Electrical.

C. Signage requirements included on the Drawings.

1.3 REFERENCES AND STANDARDS

A. California Building Code, 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 drawings, as adopted by the California Division of the State Architect (DSA).

C. Title 19, CCR, Article 33.01(i).

D. American National Standards Institute (ANSI):

1. A-117.1: Accessible and Usable Buildings and Facilities.

E. ASTM International (ASTM):

1. A53/A53M: Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
2. A153/A153M: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

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. Prior to production of shop drawings and samples, coordinate a pre-submittal conference with Architect to confirm submittal requirements, schedule, and sign review process.
2. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs. Provide template for placement of sign-anchorage devices embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Shop Drawings:

1. Scaled drawings and signage schedule for each sign indicating materials, lettering layout, and colors.

B. 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.

C. Samples:

1. Submit three samples of specified signage fonts to be used for visual and tactile characters including braille below the raised characters.
2. Color Verification: Provide physical sample of each available color form the manufacturer. Include color system name and serial number, code and name as applicable.
3. Control Samples. Samples shall be prepared on same base material to be used in fabrication. Submit one sample of each sign type. Signage types are indicated in Construction Document details. Interior signs shall be full size.
4. Symbol of Accessibility and Pictograms. Full scale sample of pictograms and symbol of accessibility to be used on sign panels and graphics.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For installer.

B. Sustainable Design:

1. 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.

C. Sample of manufacturer’s warranty.

D. Signage Schedule and Alphanumeric Nomenclature. As a component of shop drawings and informational submittals, verify with Architect the sign nomenclature; room names and numbers; text; and orientation of wayfinding pictorial graphics.

1.7 CLOSEOUT SUBMITTALS

A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

B. Maintenance data for signs and sign types including maintenance manuals.

1.8 QUALITY ASSURANCE

A. Contractor shall assure that the vendor shall be responsible for the quality of materials and workmanship of any firm acting as the vendor's subcontractor.

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. 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. The adhesion of inlaid letters and symbols will be tested. See Article WARRANTY.

F. Mockups:

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 accord with the manufacturer's written recommendations.

1.10 FIELD MEASUREMENTS

A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

1.11 WARRANTY

A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's available fully executed written warranty for signage against all defects in materials and workmanship, including without limitation against yellowing, cracking, crazing, and other visible and performance defects for a period of 5 years.

1. Text, pictograms or symbols that can be removed from the sign face utilizing a sharp object or other conventional methods will be considered a manufacturing defect.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Regulatory Standards:

1. Except as otherwise specified or shown, signage shall conform to the following:
    a. ANSI A-117.1 and the Americans with Disabilities Act (ADA).
    b. ATBCB Design Guidelines for Signage in relation to the Americans with Disabilities Act.
    c. California Code of Regulations, Titles 19 and 24.
        1) Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Refer to CBC Section 11B-703.3.
        2) All signage shall conform to CBC Section 11B-703.
    d. Uniform Sign Code.
2. When there is a conflict between the CBC and ADA, comply with the most stringent.

B. Design Criteria: Refer to Chapter 11B of the California Building Code.

1. Raised Characters: Section 11B-703.2.
    a. Depth: Section 11B-703.2.1.
    b. Case: Section 11B-703.2.2.
    c. Style: Section 11B-703.2.3.
    d. Character Proportions: Section 11B703.2.4.
    e. Character Height: Section 11B-703.2.5.
    f. Stroke Thickness: Section 11B-703.2.6.
    g. Character Spacing: Section 11B-703.2.7.
    h. Line Spacing: Section 11B-703.2.8.
    i. Installation Height and Location: Section 11B-703.4.
2. Braille: Section 11B-703.3.
    a. Contracted (Grade 2) Braille with rounded or domed dots shall be used wherever Braille is required.
        1) Braille dimensions in accordance with Table 11B-703.3.1.
3. Visual Characters: Section 11B-703.5.
    a. Character Proportions: Section 11B-703.5.4.
    b. Stroke Thickness: Section 11B-703.5.7.
    c. Character Spacing: Section 11B-703.5.8.
    d. Line Spacing: Section 11B-703.5.9.
4. Pictograms: Section 11B-703.6.
    a. Pictogram Field: 11B-703.6.1.
        1) Characters and Braille shall not be located in the pictogram field.
    b. Finish and Contrast: Section 11B-703.6.2.

1) Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.

c. Text Descriptors: Section 11B-703.6.3.

1) Locate text descriptors directly below the pictogram field.

2) Text shall be raised characters with braille directly below.

5. International Symbol of Accessibility: Section 11B-703.7.2.1.

6. Toilet Room Door Symbols: Section 11B-703.7.2.6.

7. Tactile Exit Signs: Tactile exit signage to comply with1013.4 and 11B-703.4.

C. Sustainable Design:

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 6116.

D. Materials, Unless Otherwise Noted:

Manufacturer and Product: "Inlaid Tactile Sign" by Accent Signage Systems, Inc. Minneapolis, MN, 800-215-9437 as specified and the basis of design; Ellis & Ellis Sign Systems, Sacramento, CA, 916-924-1936; ASI-Modulex, Los Altos, CA, 650-940-1354; Weidner Architectural Signage, Sacramento, CA; or equal.

1. Sign Face: Two 1/8-inch plies with eased edges; New Hermes "Gravo-Tac," or equal.
   a. Total Thickness: 1/4 inch.
   b. Painted signs will not be accepted.
2. Tactile Text: Provide tactile text and "Raster" Braille at plastic tactile signage.
   a. Tactile text shall be inlaid into sign face 1/32-inch and raised 1/32- inch minimum above sign face surface.
   b. Inlaid text shall be 1-ply, 1/16-inch thick material; "Gravo-Tac" Exterior or equal.
   c. Provide text and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position and colors.
   d. Symbols where specified shall be International Style.
   e. Braille shall be Contracted (Grade 2) Braille.
      1) Dots shall be 0.10-inch on centers in each cell, 0.30-inch on center between corresponding dots in adjacent cells, and 0.395-inch minimum to 0.400-inch maximum on center between corresponding dots in cell directly below.
      2) Dots shall be raised a minimum of 0.025-inch and a maximum of 0.037-inch above the background, and a base diameter of 0.059-inch minimum and 0.063- inch maximum.
      3) Dots with straight sides and flat tops are not acceptable.
3. Colors: High contrast, non-glare, integral colors for graphics.
   a. Integral materials shall be U.V. stabilized.

b. Characters, symbols and pictograms shall be in high contrast (light color) with background (dark) color and must conform to the CBC and the ADA Standards.

E. Fabrication:

1. Panel Appearance: Manufacturer's standard, high contrast, semi-matte colors.
2. Surface Texture: Matte Non-glare.
3. Character Style, Size and Layout Position:
   a. Characters shall be 1-inch high, unless otherwise indicated.
   b. The stroke of the uppercase letter “I” shall be 15 percent maximum of the height of the character.
   c. The width of the uppercase letter “O” shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter “I”.
   d. Character style to be Sans Serif, uppercase, accompanied by Braille directly below text at all locations where raised characters are required.
   e. Spacing between baselines of separate lines of raised characters with a message shall be 135 percent minimum and 170 percent maximum of the raised character height.
4. Text Schedule: Confirm text, symbols and numbering with the Architect and Owner.
5. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text, symbols and Braille.
   a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
   b. Sign backs shall cover back side of sign from view through window on opposite side of sign.
   c. Signs that are mounted back-to-back on glazing are to be matching in size; the smaller sign is to be increased in size as reasonably required to match the larger sign.
6. Sign Shape: As indicated on the Drawings.
   a. Corners: Radiused, unless otherwise shown.
7. Inlaid Letter Adhesion Process: Inlaid material shall be adhered into 1/32-inch deep routed sign face utilizing the heat and pressure bonded/chemically welded process as developed by Accent Signage Systems for the specified “Inlaid Tactile Sign.”
   a. Sign manufacturers for the specified “Inlaid Tactile Sign” shall be familiar with and utilize the exact same manufacturing process developed by Accent Signage Systems.
   b. Manufacturer must utilize the same and required equipment, products and techniques necessary to produce authentic “Inlaid Tactile Signs” as developed by Accent Signage Systems.
   c. Other adhesive products and methods, including applied adhesive tapes will not be accepted.

F. Sign Types: Provide braille translation directly below the raised characters.

1. Toilet Room Identification Sign: In addition to the specified Door Symbol, provide a Toilet Room Identification Sign at the strike side of every toilet room door.
    a. Sign shall include an International Symbol of Accessibility, pictogram, and raised characters, specifying the room name with Braille translation below pictogram.

2.2 PLASTIC SIGNS - NON-TACTILE

A. Materials, Unless Otherwise Noted:

Manufacturer and Product: Acrylic panel sign as manufactured and distributed by Ellis & Ellis Sign Systems, 916-924-1936, as specified and the basis of design, or equal.

1. Sign Face: 1/4-inch, matt finish, non-glare acrylic with subsurface vinyl and paint. Painted faces will not be accepted.
2. Colors: Colors shall match specified Tactile Signs and as selected by Architect and Owner.
    a. Integral materials shall be U.V. stabilized.
    b. Graphics and text shall be in high contrast (light color) with background (dark) color.

B. Fabrication:

1. Sign Thickness: 1/4-inch.
2. Character Style, Size and Layout Position:
    a. Characters shall be a minimum of 1-inch high, unless otherwise indicated.
    b. The stroke thickness of the uppercase letter “I” shall be 10 percent minimum and 20 percent maximum of the height of the character.
    c. The width of the uppercase letter “O” shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter “I”.
    d. Letter style to be Sans Serif, uppercase.
    e. Space characters 10 percent minimum and 35 percent maximum of height of characters, measured between two closest points of adjacent characters, excluding word spaces.
    f. Spacing between baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of character height.
3. Text Schedule: Confirm text, symbols and numbering Architect and Owner using the shop drawing/submittal process.
4. Sign Size: As indicated on the Drawings or, if not shown, as reasonably required to accommodate text and symbols.
    a. Where signs are installed on window glazing, fabricate a blank sign back to match in size and shape to sign.
    b. Sign backs will cover back side of sign from view through window on opposite side of sign.

5. Sign Shape: As indicated on the Drawings or, as reasonably required to accommodate the specified text and size at lettering.
   a. Corners: 1/4-inch radius, unless otherwise shown.

C. Sign Types:

1. Toilet Room Door Symbol: Provide one of the following symbols as appropriate to the toilet room type. Toilet Room Door Symbols shall have a color contrast that is distinctly different from the color of the door. Characters, as shown, to be flush with face of symbol. The entire background color must contrast with door. A thin contrasting border around the symbol, with remainder of sign background in a non-contrasting color is not allowed.
   a. Girls: 12-inch diameter circle, with eased edges.
   b. Boys: Equilateral triangle with sides 12-inches long, with eased edges.
   c. Women: 12-inch diameter circle, with eased edges.
   d. Men: Equilateral triangle with sides 12-inches long, with eased edges.
   e. Unisex or Staff: equilateral triangle of contrasting color and super imposed on and geometrically inscribed within the face of 12-inch diameter circle, which is a contrasting color to the door. The vertices of the triangle symbol shall be located ¼-inch maximum from the edge of the circle with the vertex pointing upward. Both the circle and triangle to have eased edges.

2.3 METAL SIGNS

A. Letter Style:

1. The stroke thickness of the uppercase letter “I” shall be 10 percent minimum and 20 percent maximum of the height of the character.
2. The width of the uppercase letter “O” shall be 60 percent minimum and 110 percent maximum of the height of the uppercase letter “I”.
3. Letter style to be Sans Serif, uppercase.

B. Metal Reflectorized Signs:

1. Blue reflective vinyl background with white copy or symbol on 0.080 aluminum unless noted otherwise:
   a. Disabled Accessible Parking Stall:
      1) International Symbol of Accessibility with text below to read “MINIMUM FINE $250”.
      2) Pole mounted.
   b. Van Accessible Parking Stall:
      1) Same as Standard Accessible Parking Stall sign with text below to read "VAN ACCESSIBLE".
      2) Pole mounted.
2. Parking Lot Entrance: Text as shown on the Drawings, on dark blue background.

C. Metal Painted Signs: Baked enamel on steel.

1. Gate Sign: 4-inch high lettering in all caps to read: “EXIT”.
   a. Provide at exit gate(s) as shown.
   b. Colors: As selected by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.

B. Verify that specified items may be installed 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 INSTALLATION OF SIGNS

A. General: Locations of signs must be in accordance with the Drawings and approved shop drawings.

B. Plastic Signs:

1. General:
   a. Provide both mechanical fasteners and either adhesive or 2-sided adhesive tape as recommended by manufacturer for given mounting substrate.
   b. Fasteners: Minimum 4-recessed flush head tamper-proof (vandal-resistant) screws per sign.
2. Wood and Metal Framed Walls: Mechanical fasteners shall be of adequate length to penetrate exterior finishes and provide secure embedment into wall structure or sheathing.
3. Masonry Walls:
   a. At split-face concrete masonry (CMU) walls, Contractor shall be responsible for providing a “bushed-down,” level, rectilinear, and smooth, area, 1/2-inch larger than sign all around for flush sign mounting.
   b. Contractor shall not grind or prep CMU wall until signs are on site and exact sign size and location are verified and approved by Architect.
4. Glass:
   a. Utilize mounting adhesive and silicone where signs are mounted to glass.
   b. Provide vinyl window sign backer to match sign face size, mounted on opposite side of glass.
   c. Signs mounted back-to-back are to be matching in size.
   d. Do not pre-drill signs for mechanical fastening where sign is to be mounted to glass.

C. Pole Mounted:

1. General:
   a. Mount signs using galvanized steel carriage bolt with hex nut and washer.
   b. Touch up bolt head with paint to match background.
2. Accessible Parking Stall Sign:
   a. Provide one sign at each stall.
3. Parking Lot Entry Sign: Provide sign at location and height as indicated on the Drawings.
4. Pole: ASTM A53, Grade B, hot-dip galvanized in accordance with ASTM A153.
   a. Diameter and Height: As shown on the Drawings.
5. Foundations: Pole mounted signs shall be mounted in concrete footing as shown on the Drawings.

3.3 PROTECTION

A. Protect work and materials of this Section and other Sections prior to and during installation, and protect the installed work and materials of all other trades.

B. 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.

3.4 ADJUSTING AND CLEANING

A. Remove all dust, dirt, finger marks, etc. from signs and letters using cleaning methods as recommended by manufacturer.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Floor-supported, overhead-braced, solid plastic toilet partitions.
2. Solid plastic urinal screens.

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 10 2800, Toilet Accessories.

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. National Fire Protection Agency (NFPA)

1. NFPA 286: Fire Test for Evaluation Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

D. ASTM International (ASTM):

1. A 167: Standard Specification for Stainless and Heat-Resisting Chromium. Nickel Steel Plate.
2. B 221: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
3. E 84: Test Method for Surface Burning Characteristics of Building 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.

B. Scheduling and Coordination:

1. Floor anchor plates for partitions shall be secured to structural subfloor prior to installation of mortar setting bed for tile floor.
2. Coordinate with placement of support framing and anchors in walls.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Submit plan, interior elevations and details showing components, connections and anchorages, adjacent materials, fully dimensioned and noted. Include blocking layout for use in structural framing.

B. Product Data: Submit list and manufacturer's complete descriptive data of products proposed for use. Include manufacturer's installation and maintenance instructions.

C. Samples:

1. 6-inch-square or larger sample of panel corner in selected color, showing core, edge treatment, and corner treatment.
2. Manufacturer's full range of colors for Architect's selection.
3. Hardware samples, if requested by Architect.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and installer.

B. Certification: Submit certification showing independent testing that compartments comply with NFPA 286.

C. Evidence that plastic panels are Greenguard Certified

D. Sample of manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

A. Warranty/Guarantee: Submit executed warranty and Subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Minimum 5 years' experience in manufacturing of solid plastic (HDPE) toilet compartments with products in satisfactory use under similar service conditions.
2. Installer: Minimum 5 years' experience in work of this Section.

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. 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.

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 accord with the manufacturer's written recommendations to avoid deformation.

1.10 FIELD MEASUREMENTS

A. Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

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 plastic toilet partition system against defects in materials and workmanship including breakage, warpage, corrosion or delamination of installed plastic components, door latch and strike, integral hinge system and stainless steel shoes and wall brackets for a period of 25 years.

1. Defective components shall be replaced.
2. Labor for reinstallation shall be included.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Comply with accessibility requirements of CBC Section 11B-604, “Water closets and toilet compartments,” and ADA “Standards for Accessible Design.” Comply with the most stringent where there is a conflict.

B. Brace partitions to structure to meet seismic provisions of the CBC.

C. Fire Resistance when Tested in accordance with ASTM E 84:

1. Smoke Developed Index: Not to exceed 450.
2. Flame Spread Index: Not to exceed 75.
3. Material Fire Ratings:
    a. Test Method: NFPA 286.
    b. Rating: International Code Council (ICC) Class A.

D. Sustainable Design:

1. Plastic panels shall be Greenguard Certified.

2.2 TOILET COMPARTMENTS

A. Manufacturer and System: “Hiny Hiders” by Scranton Products, or equal:

2.3 MOUNTING CONFIGURATIONS

A. Toilet Enclosures: Floor-supported, overhead-braced.

B. Urinal-Screen Style: Post-to-ceiling supported flat panel.

2.4 MATERIALS AND COMPONENTS

A. Doors, Panels and Pilasters:

1. Material: High density polyethylene (HDPE), fabricated from polymer resins compounded under high pressure, forming single thickness panel.
    a. Surface Characteristics: HDPE shall be waterproof and nonabsorbent, with self-lubricating surface, resistant to marks by pens, pencils, markers, and other writing instruments.
2. Minimum Finished Thickness:
    a. Panels and Urinal Screens: 1 inch straight cut with fine radius edge.
    b. Stiles: 1 inch straight cut with fine radius edge.
    c. Doors: 1 inch straight cut with fine radius edge.
3. Door Width:
    a. Typical: 24 inch minimum.
    b. Accessible Stalls: Sized to provide minimum 36 inch clear opening.
4. Door and Panel Height: 55 inches mounted 14 inches above finish floor.
5. Urinal Screens:
    a. Height: 42 inches mounted 14 inches above floor.
    b. Depth: 18 inches.

B. Leveling Device: 7-gauge (0.0874 inch) hot rolled steel bar; chromate-treated and zinc-plated; through-bolted to base of solid color reinforced composite stile.

C. Stile Shoes: Type-304, 20-gauge (0.036 inch) stainless steel with satin finish.

1. Top shall have 90 degree return to stile.
2. Shoe shall be one-piece and capable of being securing fastened to stiles.

D. Headrails: 1-inch x 1-5/8-inch minimum, heavy-duty tubular stainless steel or extruded anodized aluminum, satin finish, anti-grip profile.

E. Floor to Ceiling Posts: 1-1/4 inch square x 18 gauge stainless steel with satin finish, full height, where indicated.

F. Other Components: Non-corroding metal.

2.5 HARDWARE AND FITTINGS

A. General:

1. Hardware shall be ADA and accessibility compliant.
2. All hardware to be 18-8, type-304 stainless steel with satin finish.
3. Hardware of chrome-plated “Zamak”, aluminum, or plastic is unacceptable except as otherwise specified.
4. All hardware to be Vandal-Resistant, Institutional Grade.
5. Each through-bolted fasteners and threaded bass insert shall withstand direct pull force exceeding 1,500 pounds.
6. Emergency Access: Hinges and door latch shall allow door to be lifted over keeper from outside compartment on inswing doors.

B. Mounting Brackets:

1. Panels: 18-gauge (0.048 inches) stainless steel, full height of panel.
   a. U-channels shall be furnished to secure panels to stiles.
   b. Angle brackets shall be furnished to secure stiles to walls and panels to walls.
   c. Fasteners at locations connecting panels-to-stiles shall utilize through bolted, stainless steel, pin-in-head Torx sex bolt fasteners.
2. Urinal Screen: 11 gauge (0.120 inches) stainless steel, full height of panel.

C. Hinges and Stops:

1. Hinges: Self-closing, 16-gauge (0.060 inch) continuous piano hinge.
   a. Continuous piano hinge, self-closing gravity type, shall be attached to door and stile by theft-resistant, pin-in-head Torx stainless steel machine screws into factory-installed, threaded brass inserts. Fasteners secured directly into the core are not acceptable.
2. Stops: Two 11-gauge (0.120 inch) stainless steel door stop plates with attached rubber bumpers to resist door from being kicked in/out beyond stile.
3. Door stops and hinges shall be secured with stainless steel, pin-in-head Torx machine screws into threaded brass inserts.

D. Latch, Strike, and Keeper:

1. Stainless steel door latch shall slide into a stainless steel keeper.
   a. Sliding door latch shall require less than 5-pound force to operate. Twisting latch operation is not acceptable.
   b. Latch track shall be attached to door by machine screws into factory-installed threaded brass inserts.
2. Through bolted, stainless steel, pin-in-head Torx sex bolt fasteners shall be used at attach keeper-to-stile.
3. Mount latch at 42-inches above the finished floor in accessible stalls.
4. Track of door latch shall prevent inswing doors from swinging out beyond stile.

5. On outswing doors, door keeper shall prevents door from swinging in beyond stile.
6. Bumper: Extruded black vinyl.

E. Locking: Door locked from inside by sliding door latch into keeper.

F. Coat Hook and Bumper:

1. Combination type.
2. Equip outswing doors at accessible compartments with second door pull and door stop.
3. Mount hook at 48-inches above the finished floor in center of door on the inside of the stall.

G. Door Pulls:

1. Provide door pull and wall stop for outswinging doors.
2. Equip doors to accessible stall with both inside and outside pulls.
3. Pulls shall be "U" shaped.

H. Fasteners: As recommended by partition manufacturer and the following:

1. Use stainless steel hardware to attach panel-to-stile brackets, coat hooks, and latch keepers.
2. Exposed Bolts and Screws: Theft-resistant, one-way heads, stainless steel, ASTM A167; Type 304, pinhead Torx screws.

2.6 COLORS AND FINISHES

A. Color of HDPE: match existing.

B. Stainless Steel: No. 4 satin finish.

C. Aluminum: Clear Anodized.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation, carefully inspect and verify that the installed work of other trades is complete to the point where this installation may properly commence.

B. Verify that toilet partitions may be installed in complete accordance with the original design. Verify solid blocking has been provided in walls and ceilings at all partition and bracing connection locations. Do not install if blocking is missing.

C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 INSTALLATION

A. General:

1. Install all toilet partitions and screens where indicated on the Drawings and reviewed shop drawings, anchoring into solid blocking in compliance with manufacturer's installation instructions.
2. Install partitions and screens rigid, straight, plumb and level.

B. Provide clearances of not more than 3/8 inch between pilasters and panels, and not more than 1/2 inch between panels and walls and not more than 3/8 inch between vertical edge of doors and pilasters.

C. Secure panels to walls with full length, continuous wall brackets using stainless steel fasteners spaced maximum 12 inches on-center.

D. Stile shoes shall be anchored to floor with 1-1/2 inch, #14 stainless steel screws and metal anchors. Secure pilaster within shoe with theft resistant sex bolt.

E. Attach panels and pilasters to continuous brackets with theft resistant sex bolts.

F. Secure overhead brace to face sheets with not less than 2 fasteners per face.

G. Set tops of doors to be parallel with top of pilasters and overhead brace when doors are in closed position.

H. Urinal Screens: Provide floor to ceiling post and wall brackets.

3.3 ERECTION TOLERANCES

A. Maximum Variation From True Position: 1/4 inch.

B. Maximum Variation From Plumb: 1/8 inch.

3.4 ADJUSTING

A. Make final adjustments to leveling devices.

B. Adjust and lubricate hardware for proper operation after installation.

1. Set hinges on in-swing doors to hold doors open approximately 30 degrees from closed position when unlatched.
2. Set hinges on out-swing doors to return to fully closed position.

C. Replace damaged parts, surfaces which are not free from imperfections. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.5 CLEANING

A. Upon completion, and as a condition of acceptance, visually inspect the entire work of this Section. Surfaces shall be free of imperfections, scratch marks, blemishes or color variations.

B. Upon completion, thoroughly wash surfaces, remove foreign material, and polish surfaces.

C. Leave entire work in neat, orderly, clean, acceptable condition as approved.

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, make all repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

C. Adequately protect products during and after installation against damage of every nature. Exposed finishes shall be free from scratches, dents, permanent discolorations and other defects in workmanship or materials.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Toilet accessories.

1.2 RELATED REQUIREMENTS

A. Section 10 2113, Plastic Toilet Compartments.

B. Division 26, Electrical.

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).

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: Coordinate with other trades as required to ensure proper and adequate provision in framing and wall finish for the installation of the selected toilet accessories in the locations required including recessed items)

1.5 ACTION SUBMITTALS

A. Product Data: Submit list of each required accessory and complete descriptive data of products proposed for use. Include manufacturer's specifications, published warranty, installation instructions, and maintenance instructions.

1.6 INFORMATIONAL SUBMITTALS

A. Sample of manufacturer’s warranty.

1.7 CLOSEOUT SUBMITTALS

A. Warranty/Guarantee: Submit executed warranty and Subcontractor’s guarantee.

B. Maintenance data and operating instructions.

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. 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.

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 accord with the manufacturer's written recommendations.

1.10 FIELD CONDITIONS

A. Make and be responsible for field dimensions necessary for proper fitting and completion of Work. Report discrepancies to Architect before proceeding.

B. Verify wall depths are adequate for each item prior to ordering. Notify Architect of conflicts or discrepancies.

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 toilet accessories against defects in materials and workmanship, agreeing to replace and install toilet accessories at no additional cost to the Owner, within warranty period as follows:

1. Grab bars: For a period of 3 years.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Conform to applicable requirements of ADA and CBC for accessibility. When in conflict, conform to the most stringent.

2.2 MANUFACTURERS

A. Accessories: Bobrick Washroom Equipment Inc. or Bradley Corporation as specified and the basis of design, unless otherwise noted, or equal.

1. Manufactured accessories not specified shall require approval as a substitution to be considered equal. Refer to substitution requirements specified in Section 01 3300, Submittal Procedures.
2. Although multiple manufacturers may be specified for a specific accessory, all accessories shall be the product of a single manufacturer, unless otherwise specified or approved.

2.3 MANUFACTURED UNITS

A. Grab Bars: 18 gauge 1-1/2 inch outside diameter, type 304 stainless steel welded to 1/8 inch type 304 solid stainless steel wall plates; Bobrick Series B-6806, Bradley 812 Series, or equal.

1. Configurations and Lengths: As shown.
2. Grab bar shall withstand a 250 pound point load.
3. Joints ground and polished.
4. Finish on Exposed Surfaces: Satin.
5. Fastening: Concealed, vandal resistant.

2.4 FASTENINGS

A. Toilet accessories shall be complete with required fastenings.

B. Fastenings shall either harmonize with the item being fastened, or be of the concealed type.

C. Exposed fastenings shall be theft and vandal-resistant.

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. Verify that specified items may be installed in accordance with the approved design.

C. In the event of discrepancy, immediately notify the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PREPARATION

A. The Contractor shall provide recesses, anchorage and back-up blocking in sizes and in locations as required for proper installation of accessories. Coordinate with other trades where necessary to make provisions for installation.

B. Securely anchor items in place in locations and at mounting heights indicated. Where specific dimensions are not noted, installation shall be approved by the Architect.

C. Securely fasten grab bar mounting plates to solid framing or blocking, in accordance with CBC.

3.3 INSTALLATION

A. Grab bars: Solidly anchor grab bars to withstand minimum downward pull of 500 pounds between any 2 supports after installation.

B. Sealants: Comply with requirements of Section 07 9200, Joint Sealants.

3.4 CLEANING AND ADJUSTING

A. Upon completion of installation, remove manufacturer's temporary labels, marks of identification.

B. Thoroughly wash surfaces, remove foreign materials, polish surfaces.

C. Leave entire accessories in neat, orderly, clean, acceptable condition as approved.

D. Replace damaged parts, surfaces which are not free from imperfections.

3.5 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, make repairs and replacements necessary to the approval of the Architect at no additional cost to the Owner.

C. Exposed finish shall be free from scratches, dents, permanent discolorations and other defects in workmanship or material.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE

A. Furnish and install all electrical systems as shown and specified, including wiring and connections to certain equipment furnished by others and any work not specifically noted but that can be reasonably inferred or is necessary to provide a complete functional system.

B. There is no pre-bid equipment or materials for this project. Contractor shall order, furnish, and install all materials and equipment required for a complete and fully functional installation. All costs for material and installation shall be included in Contractors bid.

C. Contractor shall guarantee installation, material and equipment for a period of one (1) year from date of final completion.

D. It is mandatory for all bidders to attend the pre-bid walk.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 7329 – Cutting and Patching

B. Section 01 3516 – Alteration Project Procedures

C. Section 07 8400 – Fire Stopping

1.3 PRODUCT HANDLING

A. Contractor shall be responsible for delivery, storage, protection and placing of all equipment and materials.

B. Protection: Contractor shall protect from damage during construction, work and materials of other trades as well as electrical work and material. Electrical equipment stored and installed on job site shall be protected from dust, water, or any other damage.

1.4 RULES AND REGULATIONS

A. All work and materials shall be in full accordance with the latest rules and regulations of California Code of Regulation, Title 24 California Building Standards Code, National Electrical Code, Local City and County Code, applicable regulations of local utility companies, E.U.S.E.R.C. Standards, and General Order 95 of the Public Utilities Commission, and any other applicable laws or regulations.

B. Nothing in these drawings or specifications is to be construed to permit work not conforming to the above codes.

C. Drawings and/or specifications shall take precedence when work and material called for exceed code requirements.

1.5 INSPECTIONS

A. Inspections required during construction shall be arranged by the Contractor. On completion of the work, furnish Engineer with certificates of inspection

1.6 DRAWINGS AND SPECIFICATIONS

A. Information presented in the specifications and on the drawings are as exact as could be secured but their extreme accuracy is not guaranteed. The Drawings and Specifications are for the assistance and guidance of the Contractor, and exact locations, distances, levels, etc., will be governed by the site and building, and the Contractor shall accept same with this understanding.

B. The drawings indicate schematically the layouts of equipment, accessories and wiring systems and shall be followed as closely as possible. Other drawings and actual field conditions shall be examined, noting all conditions that may affect this work. Report conflicting conditions to the Engineer for adjustment before proceeding with work.

C. Minor changes may be made, providing change is ordered before equipment and wiring systems or work directly connected to same is installed and no extra materials are required.

D. Where conflicts between the written specifications and the drawings occur the more stringent requirement shall apply.

1.7 STRUCTURAL REQUIREMENTS

A. Installation under this section shall comply with the California Building Code. Obtain the Structural Engineer's approval before performing any cutting or patching of concrete, masonry, or wood structure in the building.

1.8 EXAMINATION OF SITE

A. The Contractor shall be held to have visited the site, checked existing conditions, and satisfied himself as to the conditions under which the work is to be performed before submitting his bid. No allowances shall be made in his behalf for any extra expense to which he may be put due to failure or neglect to discover conditions affecting his work.

1.9 MATERIAL AND EQUIPMENT

A. Unless otherwise noted, all material and equipment shall be new, of the type, capacity and quality specified and free from defects. Material shall bear the label of, or be listed by the Underwriters' Laboratories unless of a type for which label or listing service is not provided.

B. Materials shall be of the same brand or manufacture throughout for each class of material or equipment wherever possible.

1.10 MATERIAL SUBSTITUTIONS

A. Specific brand names mentioned shall establish standards of performance and quality and the phrase "or approved equal" shall be implied unless otherwise noted.

B. Substitute materials shall be equal in all respects including quality, arrangement, physical size, capacity, performance, and utility to those specified. Approval of substitute material shall be

regarded as general only and shall not relieve the Contractor from complying with the requirements of the Drawings and Specifications; the Contractor shall be responsible, at his own expense, for any damage caused by proposed substitutions, which affect other parts of his own work or the work of other contractors.

C. Only one proposed substitution will be considered for each item. No consideration will be given to substitutions past 10 day limit. Should the original submittal of a proposed substitution be rejected, the specified item shall be furnished.

D. The submittal of a proposed substitution shall clearly establish the following:
   1. The item can be transported into and installed in the intended space and in the manner shown.
   2. Required connections (electrical, conduit, and other) can be properly made and adjoining work can be properly accomplished.
   3. The proposed substitute is similar to and of substance equal to that specified, is suited to the same use as that specified, and will perform the functions required by design.

E. By submitting a proposed substitution, the Contractor agrees to the following:
   1. He will assume full responsibility for any and all modifications necessary alterations arising from the use of the substitute item or material including all cost incurred by all other trades.
   2. He will assume full responsibility for any delay in the construction schedule resulting from the use of the substitution.
   3. He will prove harmless and indemnify the Owner and the Owner's design consultants from real or alleged damages that may result from the installation, use, or performance of a substitute material product.

F. The following conditions apply to substitutions:
   1. Submittals of substitutions are not and do not become part of the contract documents.
   2. Contractor shall not order, fabricate, use, or install any substitute product or procedure unless he has received acceptance of the substitution from the Engineer.
   3. Should the Contractor install any substitute product in violation of the above he shall remove it and install the specified product at his own expense.
   4. The Contractor shall provide a letter stating that all the above items shall apply to all substituted products and equipment.
   5. Any submittal for substituted equipment or product that does not clearly show that the substituted item is equal shall be rejected and no further submittal shall be allowed on the substituted item. Provide in submittal format documentation that the proposed item is exactly as specified in the contract documents.

1.11 SHOP DRAWINGS AND SUBMITTALS

A. General
   1. Within 15 calendar days after award of the Contract, and before fabrication and installation of any material, submit for approval six copies of complete submittal data containing complete information and catalog cuts, shop drawings, and other data on all materials, systems and equipment, including equipment which is to be furnished as specified. The submittal data shall be complete for the project and submitted at one time.

2. Submit only one manufacturer for each item or product included in the submittal package; Product intended for use on this project shall be highlighted or otherwise uniquely identified.
3. If catalog cuts are submitted which also include products on the same page that are not allowed on this project, that product shall be crossed out or otherwise acknowledged as not being permitted on this project.
4. Individual groups of submittal types must include a cover sheet with table of contents, identifying each item by the name or symbol used in the construction documents, if applicable; the manufacturer; and complete catalog number. Any item which is a substitute being submitted for consideration, shall be clearly marked as a substitute.
5. All submittals shall be checked by the Contractor for conformance to the requirements of the Construction Documents before forwarding for approval. Contractor shall be responsible for all quantities and errors and omissions of submittals. Submittals for materials shall be accompanied with samples when requested.
6. Partial or incomplete submittals may be rejected as not complying with requirements; the Contractor shall be liable for any resultant consequences.
7. Delayed submittals may be rejected as not complying with requirements. Whether accepted or rejected, delayed submittals will not be considered justification for extension of contract time or similar relief.
8. Submittals not required or permitted by the specifications but made at the option of the Contractor, will be returned without review unless accompanied with written valid justification.
9. Submittal items improperly included with those of another category (such as a proposed substitution included with shop drawing submittal) are not valid and will be returned without review.
10. Acceptance of a submittal does not relieve the Contractor of responsibility for omissions from the submittal or errors in the submittal.

B. Review

1. Submittals will be reviewed for general acceptability, not necessarily including all details. The engineer's review is for general conformance with the design concept of the project and the information given in the contract documents. The contractor is solely responsible for confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating the work with that of other trades and performing all work in a safe and satisfactory manner. Corrections of comments made on this submittal during this review do not relieve contractor from compliance with the requirements of the contract documents or with its responsibilities listed herein.
    a. Proposed substitutes will be judged not only for acceptability of the items themselves, but also how they will be used under the conditions of the particular project.
    b. Proposed substitutions will be judged also for compliance with qualifications and conditions stipulated herein.
2. Each Reviewed submittal will be marked to indicate review and direction
    a. Acceptance of a substitute does not waive the specified requirements.
    b. Once a substitution is accepted, no revision or resubmittal may be made except for pressing and valid reason and after receipt of approval to do so.

1.12 WORKMANSHIP

A. Good workmanship shall be evidenced in the installation of all electrical materials and equipment. Equipment shall be level, plumb and true with the structure and other equipment. All materials shall be firmly secured in place and adequately supported and permanent. The requirements of the codes are minimum standards. The recommendations of the National Electrical Contractors Association Standard of Installation shall be followed except where otherwise specifically directed.

1.13 CLEANING

A. After all other work such as patching, painting, etc., has been accomplished, lighting fixtures, panelboards, switchboards, and all other electrical equipment shall be cleaned of all dirt, grease, plaster, paint or other marks.

1.14 ELECTRICAL WORK FOR EQUIPMENT PROVIDED BY OTHERS

A. Provide all necessary electrical connections to all equipment provided by others. Obtain specific power and control wiring requirements and connection points from others to perform electrical work. Contractor shall assist in testing equipment but responsibility is limited to correctly installing electrical wiring and connections.

B. All control wiring for mechanical equipment, both line and low voltage, shall be provided in the mechanical work. All disconnect switches and motor starters shall be provided by this contractor.

1.15 MANUFACTURER'S DIRECTIONS

A. Follow manufacturer's directions where these directions cover points not included on the Drawings or in the Specifications.

1.16 MISCELLANEOUS EQUIPMENT

A. This Contractor shall provide all conduit, conductors, disconnects, and connections for power and controls for equipment requiring electrical services.

1.17 MANUALS

A. In addition to the catalog data and shop drawing submitted for review as required hereinbefore, the Contractor shall furnish to the Engineer three (3) hard copies and two (2) electronic copies on a flash drive with the final corrected sets of all data applicable to the equipment furnished.

1. Each set of data per system shall be bound in one or more volumes. A top quality three-ring binder with vinyl or hard cover will be acceptable in lieu of binding; however, all insert data must be properly punched and reinforced.
2. Identification information shall include the building name, address and location, system or systems included and titled "Maintenance Manual".
3. All data shall be assembled in an orderly sequence with tabbed dividers to correspond with the table of contents.
4. Manufacturer's catalog data, shop drawings, etc., shall be marked clearly to identify the items applicable only to this project.
5. Make and model numbers of each items installed shall be marked clearly in catalog data and identified with symbols used on the Drawings. Complete data shall be provided on all

major items to include: panelboards, switchboards, transformers, lighting fixtures, starters, transfer switches, and fire and security alarm system.

6. Submit copy to Engineer for review before delivery to Owner.

1.18 GUARANTEE

A. Guarantee all electrical work and equipment to be free from defects in workmanship and material for a period of one (1) year from date of final completion. Promptly replace or repair such defects and any damage to property done during repair work at no expense to the Owner. Any warranties, or certificates available for equipment installed, shall be filed at date of acceptance and delivered to Engineer.

1.19 RECORD DRAWINGS

A. The Contractor shall furnish one set of clean "record" marked black line prints and an electronic copy in AutoCAD to the Engineer at completion showing clearly any changes made during construction. Clearly indicate electrical equipment and feeder pull box locations and switchgear, distribution panel and panelboard feeder conduit routing.

PART 2 PRODUCTS

2.1 MATERIALS

A. Unless otherwise noted, all material and equipment shall be new, of the type, capacity and quality specified and free from defects. Material shall bear the label of, or be listed by, the Underwriters' Laboratories unless of a type for which label or listing service is not provided.

B. Unless specified otherwise, all materials and equipment shall be manufactured and assembled in the United States of America. Materials shall be of the same brand or manufacture throughout for each class of material or equipment wherever possible.

C. Equipment shall be the product of a manufacturer who has, for a period of not less than five (5) years, been in successful manufacture of the equipment and who has a nationally distributed catalog covering ratings and specifications of said equipment.

D. Unless specified otherwise, exterior conduits 1 inch or smaller 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.

2.2 RACEWAY

A. Exposed runs shall be neatly installed parallel or at right angles to the structural members.

B. Pull Wires: Provide #12 in empty conduits 1" and smaller and 3/16" polypropylene rope in conduits 1-1/4" and larger.

C. Cap Conduits: Keep conduits capped until wires are pulled. Use manufacturer plugs and caps, push-penny plugs of flexible plastic or steel pennies under bushings.

D. Conduit Penetrations: Provide seamless lead flashing where conduits penetrate the roof, consisting of lead flashing and cast iron counter-flashing. Flashing shall be Semco 1100 Series,

Stoneman or equal. Where conduits pass through finished walls, provide steel escutcheon plates, chrome or painted as directed. Conduits which penetrate ceiling or floor slabs and concrete or masonry walls shall be grouted and sealed watertight at penetration.

E. Conduit Straps: Two-hole steel snap-on type with ribbed back or malleable iron with galvanized or cadmium plated finish. Secure straps with wood screws on wood material, metal screws or machine screws and bolts on metal material, toggle bolts on hollow masonry and expansion shields with machine screws on concrete or solid masonry. Use of nail straps or perforated strap iron is prohibited.

1. One-hole straps are required on masonry/concrete walls.

F. Conduit Supports: Support individual runs with split ring hangers and threaded rods and multiple runs with split conduit clamp and slotted steel channel, super strut, Unistrut or equal. Conduit shall be supported independently of one another and suspended ceiling system.

G. Slotted steel channel (strut) shall be installed with end caps.

H. Threaded rods shall be terminated with a double nut and the rod trimmed flush with the last nut.

I. Conduit sizes shown on Drawings are minimum.

J. Underground Conduit Stub Marker: Mark location of all underground conduit stubs. Provide capped conduit stake at end of stub with non-corrosive tag identifying source of stub. Set stake flush with final grade after Owner has been shown location. Extend all conduit stubs a minimum of 5"-0" beyond concrete footings, curbs or sidewalks, etc. Provide exact dimensions on record drawings for all stub locations. Cap ends of stubs.

2.3 RIGID STEEL CONDUIT

A. Standard weight, mild steel pipe, heavy wall, with threaded fittings, zinc coated on both inside and outside by a hot dipping or sherardizing process. Conduit fittings finished to same requirements as for rigid steel conduit. All couplings, unions and fittings threaded type. Compression type fittings are not acceptable.

B. Apply thread sealant to all joints except in permanently dry locations. Where installed below floor slab and in contact with fill material, or underground and in contact with earth or encased in concrete shall be double wrapped with Scotchwrap #50, Johns-Manville VID-10 or equal at double 1/2 lap (four net layers). Follow any specific instructions or methods shown on Drawings.

C. Termination of conduits, wiring gutters or boxes shall be fitted with steel locknut and insulated metallic bushing or with two steel locknuts and insulating bushings. When grounding bushings are required, use insulated grounding bushing. Where conduit connections are exposed to weather or excessive moisture they shall be fitted with insulated watertight sealing hub i.e. Myers Hub.

D. Cap underground conduit stubs.

E. All cut ends of conduit shall be reamed to remove rough edges where conduit is threaded in the field; an electrical conduit thread cutting die with a taper shall be used.

2.4 ELECTRIC METALLIC TUBING (EMT)

A. Shall be galvanized steel, thin wall. Maximum trade size to be used shall be 4". May not be used underground, under floor, exposed to weather, in concrete, or in any location subject to physical damage.

B. Connectors and couplings shall be steel rain-tight compression type requiring the tightening of a nut for trade sizes ¾-inch and smaller and set screw type for 1-inch and greater, all with insulated throat.

2.5 FLEXIBLE STEEL CONDUIT

A. Shall be galvanized steel with minimum trade size of 1/2". In wet and corrosive locations, outside, or motor connections, shall be liquid- tight. May be used to connect recessed lighting fixtures or mechanical controls and equipment. Length shall be kept to a minimum but to allow for movement or removal of equipment. Leave slack in flex connection to maintain flexibility of conduit, minimum of 3' of flex & one (1) 90° bend.

B. Connectors shall be tite-bite type with insulated throat Crouse-Hinds Series ACB or T & B Series 3110; connectors for liquid-tight shall be with insulated throat Crouse-Hinds Series LTC or T & B Series 5331 with sealing "O"- ring at outside of enclosure.

2.6 INTERMEDIATE METAL CONDUIT

A. Lightweight rigid steel conduit, light wall, with threaded fittings. Conduit shall be zinc coated on both inside and outside by hot dipping or sherardizing process, use only threaded connections, coupling or fittings.

B. Threaded conduit shall be interchangeable with standard rigid steel conduit fittings. Fitting shall be finished to same requirements as conduit. Bends and offsets less than 45 degrees permitted with the use of standard bending equipment. Bends and offsets 45 degrees and larger shall be provided with standard steel fitting and elbows.

C. May not be used underground, under floor, in concrete slabs, in concrete walls, or in any hazardous locations.

D. The number of conductors in a single conduit shall not exceed that permitted by the percentage fill specified in Table 1, Chapter 9, using the conduit dimensions of Table 4, Chapter 9, of the National Electrical Code.

E. All cut ends of conduit shall be reamed to remove rough edges where conduit is threaded in the field; an electrical conduit thread cutting die with a taper shall be used.

F. Termination of conduits in cabinets, wiring gutters or boxes shall be as called for under rigid steel conduit above.

2.7 PLASTIC CONDUIT PVC (Polyvinyl Chloride), Schedule 40, Heavy Wall, UL Listed and Labeled for Direct Burial, 90 Degrees Centigrade

A. Conform to NEMA TC-2.

B. Shall be classified for direct burial, may be used underground with sand fill evenly compacted on all sides or in concrete floor, or concrete walls, limited to structural requirements. All portions shall be concealed below grade or within concrete slab.

C. Minimum trade size shall be 3/4" with minimum 30" cover over conduit.

D. Continuation of run above grade, above floor slab into building and all bends, elbows, and risers shall be with PVC coated rigid steel conduit. Bends, elbows and risers in conduits 1" and smaller concealed underground, or in concrete floor slabs may be PVC Schedule 40.

E. Continuation of run above floor slab shall be with rigid steel, intermediate metal grade, or EMT in furred walls.

F. A copper bonding conductor shall be pulled in each raceway and bonded to equipment at each end with code lugs.

G. Duct separation shall be provided using plastic conduit spacers specifically designed for the purpose.

H. All joints shall be solvent cemented in accordance with manufacturer's recommendations.

I. In conduit 1" and smaller, standard PVC manufactured 30 degree, 45 degree and 90 degree elbows shall be used. Where bends and offsets other than the standard fittings must be used, they shall be made with the use of standard manufactured bending equipment. Any burn marks on any PVC conduit will be considered cause for rejection of entire PVC conduit installation, until the complete installation is physically inspected at Contractor's expense. Where excavation or removal of wall covering, etc., is required for inspection, Contractor shall remove and reinstall at his sole expense.

2.8 CONDUCTORS

A. All conductors shall be in raceways. Minimum size shall be #12 AWG except for control circuits, which may be #14 AWG minimum. Signal and control circuits other than mechanical shall be as indicated on Drawings or as required by equipment manufacturers.

B. Color code all branch circuits and feeders as follows:

	120/208 Volts	120/240 Volts, 1Φ	120/240 Volts, 3Φ	277/480 Volts
Phase A	Black	Black	Black	Brown
Phase B	Red	Red	Orange*	Orange
Phase C	Blue		Blue	Yellow
Neutral	White	White	White	Gray
Ground	Green	Green	Green	Green

* Marking shall comply with NEC 384-3, 215-8 & 230-56 to identify the "Stinger Leg" and its placement (Phase B) for Red Leg Delta system.

C. Control conductors may be black or color other than shown above.

D. Conductors in sizes up through #8 AWG shall have solid color finish as listed above. #6 AWG and larger shall be color coded by either solid color finish or application of phase tape for minimum of 6" length on conductor. Coding shall occur at all terminations, pull boxes and splices.

E. Color-coding shall be continuous and consistent throughout the work. Do not use different colors for switch legs, fixture taps, travelers, etc.

F. Phasing: Terminals in panelboards, motor control centers, switchboards and other equipment shall be phased A, B, C, reading left to right or top to bottom looking into the front of the equipment.

G. Circuit Identification: Each branch circuit, control and signal conductor shall be labeled with the circuit number or terminal number it is connected to. Use sleeve (tube) type markers. Conductors shall be labeled at each panelboard, switchboard, control center, terminal cabinet, pull box, and at each point of utilization such as fixtures, motors, speakers, etc. Labeling shall correspond to control diagrams where applicable.

H. All insulation shall be 600V minimum except for low voltage fire alarm wiring. Fixture tap and branch circuit wiring within fixture wireways shall be Type THHN 90 degree C. Control wiring #14 and smaller shall be Type THHN/THWN or TFF Stranded. Insulation for bonding and grounding conductors shall be Type THWN except as noted on Drawings.

I. All conductors, unless otherwise noted, shall be Type THHN/THWN. RHW-2 shall be used where shown. XHHW-2 shall be used in feeders run on the exterior of buildings or roof tops where exposure to direct sunlight occurs and between the output of a VFD and the motor served.

J. Conductors #10 AWG and smaller shall be copper, 98% conductivity, stranded or solid, except for control conductors which shall be stranded. Conductors #8 AWG and larger shall be stranded copper, 98% conductivity.

K. Splices: For conductors #10 and smaller, pre-insulated type connectors, 3M Scotchloks, T & B Piggys or equal, nylon self-insulated type. Splices #8 and larger use compression type connector, Burndy type YS long barrel, requiring the use of a 360 degree circumference compression type tool, then insulated with Scotchtape No. 88 or equal. Use Scotchfill or equal around large or irregular shape splices for insulation build-up and Scotchtape No. 88. Wire splicing devices shall be sized according to manufacturer's recommendations.

L. Splices in underground pull boxes or in other areas subject to moisture shall be provided with cast resin kits and cadweld or compression type connections, Burndy type YS long barrel. Use Scotchlok sealing packs for wire size to #10 and Scotchcast kits for larger splices as recommended by 3M Company. All splices to be prepared as hereinbefore specified before resin kits are applied. Wire splicing devices shall be sized according to manufacturer's recommendations.

M. Cable Ties: For wire training and clamping in cabinets and enclosures use nylon cable ties.

N. Wire Pulling Lubricant: Poly-water-J, or other UL approved lubricant.
   1. Approved lubricant characteristics will have no flash point, will not be flammable and have an NFPA hazard rating of 0 for health, fire and reactivity.
   2. Comply with OSHA Regulation 29 CFR 1910.1200.
   3. Flax soap is not approved and is not permitted on job.

O. Swab conduits before installing cables, and exercise care in pulling to avoid damage or disarrangement of conductors, use approved grips.

P. Terminating of #8 and larger conductors shall require the use of two (2) hole pad, long barrel copper compression terminals. A 360 degree circumference compression type tool shall be used.

Q. Cable Identification: Non-ferrous identifying tags or pressure sensitive labels shall be securely fastened to all cables, feeders and power circuits in pull boxes. Tags or labels shall be stamped or printed to correspond with markings on drawings or marked so that feeder or cable may be readily identified.

2.9 BOXES

A. Shall be of size and shape best suited for particular application, properly code sized for number of wires and conduits passing through or terminating therein, but in no case less than four inches square or octagon. Support boxes directly to structural members, framing or blocking by means of screws, anchors, bolts or embedded in masonry or concrete.

B. Outlet boxes shall be one-piece pressed steel, sherardized or galvanized. Boxes shall be fitted with flush device covers and "Plaster Rings", or tile rings in masonry or concrete. Surface covers shall be used where exposed wiring is permissible. Lighting outlets shall be fitted with 3/8" malleable fixture stud. Boxes in damp or outdoor locations shall be malleable iron with threaded hubs, fitted with gasket and cast cover.

C. Pull Boxes: Indoor pull boxes fabricated of code gauge steel, of size shown or as required, complete with screw covers, flush type in finished areas, surface type in unfinished areas, primed, and painted. See drawings for additional requirements.

D. Pull boxes used outdoors or in damp locations fabricated of code gauge steel with rain-tight welded seams, conduit hubs on top or sides, screw covers with neoprene or korprene gaskets. Hardware non-ferrous metal or hot-dipped galvanized. Boxes located on roof, entire boxes painted two coats of rust-inhibiting aluminum paint, "Rustoleum" or equal. Boxes located on building walls or free standing; finish power paint color to match exterior building color. Building with new portable generator tap boxes, color to match building exterior finish.

2.10 FINISH MATERIAL

A. Plates: Shall be nylon for flush wall devices, weatherproof series for damp and outdoor locations and zinc-plated steel for surface installation.

B. Outdoor receptacle installations shall be equipped with In-use, lockable, metallic covers.

C. GFCI Receptacles: Rated 20 amperes at 125 volts, double sided contact, back side wired, Ivory color.

Manufacturer	Duplex 3-Wire Grounding
Pass & Seymour	2097
Cooper	2097
Leviton	GFNT2

D. Refer to drawings for special outlets.

2.11 FIRESTOPPING

A. Fire stopping shall be: As manufactured by Hilti Construction Chemicals, Inc. or Equal

2.12 PANELBOARDS

A. Arrangement as indicated on Drawings is based on existing panelboards. Panel class, size, breaker ratings, etc. shall be as shown on Drawings.

B. Multiple pole circuit breakers shall have internal common trip connections. All breakers shall be bolt-on to the bus type, with a minimum symmetrical amp rating of 22,000 RMS unless noted otherwise in the drawings. All breakers shall be listed for termination of copper, insulated at 75oC temperature rating or higher. All breaker lugs shall be copper. Breakers shall be fully rated for the symmetrical amp rating listed unless specified otherwise.

C. Panel schedules shall be updated with one that is type written. Provide a plastic cover for the new schedule.

D. Conduits shall enter cabinet through neat hole and perpendicular to entrance face.

PART 3 EXECUTION

3.1 COOPERATION

A. Coordinate work with that of all contractors and vendors on the job for an efficient and effective completion of the project. Refer to the contract documents of other trades for construction details.

3.2 WORKING SPACE

A. Adequate working space shall be provided around electrical equipment in strict compliance with the Electrical Safety Orders. In general provide six and one-half feet (6'-6") of headroom and thirty-six inches (36") minimum clear workspace in front of panelboards and controls for 120/208 volt equipment, and forty two inches (42") for 277/480 volt equipment.

3.3 FLASHING AND SEALING

A. Flash and counter-flash roof and wall penetrations with lead flashing and cast iron counter-flashing as approved by the Engineer. Conduits, ducts, etc., passing through finished walls shall

be fitted with steel escutcheon plates, chrome or paint finish as directed. Conduits, which penetrate, floor slabs and concrete or masonry walls shall be grouted and sealed watertight at penetration.

3.4 FIRESTOPPING AND FIRE RATED PENETRATION

A. Maintain fire rating of all fire rated walls, ceilings, floors, roof, etc. Use UL listed Hilti Construction Chemicals, Inc product, suitable for the application. Installation shall also maintain watertight integrity through all penetrations where water may be present. Install in accordance with manufacturer's recommendations and within UL Listing installation requirements.

3.5 EXCAVATION AND BACKFILL

A. Perform excavation and backfill required for electrical installation. Restore all surfaces, roadways, walks, curbs, walls, existing underground installations to original condition in an acceptable manner.

B. Install utility locator tape in all trenches.

1. 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.

E. Excavation: Dig trenches straight and true to line and grade with bottom smooth of any rock points. Support conduit for entire length of undisturbed original finished or natural grade (unless noted otherwise).

1. Backfill: Backfill shall be tamped in six inch (6") layers, with rock free sand to 6” cover above the conduit then Class #2 Road Base to finish grade as directed by settlement. Backfill under floor slabs on grade shall conform to applicable requirements of other sections of the Specifications.

3.6 EQUIPMENT IDENTIFICATION

A. Nameplates shall be installed on electrical equipment, including switchboards, switchboard circuit breakers, panelboards, disconnect switches, time switches, contactors, motor starters, pullboxes, cable tap boxes, etc., and wall switches for lighting or other devices where the control function is not self-evident.

B. Nameplate shall adequately describe the item and its function, or use of the particular equipment involved including:

1. Power source immediately upstream indicating panel and circuit number(s).
2. Rating of the serving feeder

C. Nameplate material shall be laminated phenolic plastic, black front and back with white core, engraved and fastened with cadmium plated steel self-tapping screws, or brass bolts.

D. Installed switchboards shall include a label noting “Installed By:”, the name of the installing Electrical Contractor, Telephone Number, and the Date of installation.

E. All receptacles shall be identified per source panel and circuit number.

F. Coordinate with the local power utility to obtain the available short circuit current for the electrical service. Provide a phenolic label at the main switchboard noting the available short circuit current and the date the information was obtained.

3.7 EQUIPMENT FINISH AND PAINTING

A. All electrical equipment, including switchboards, switchboard circuit breakers, panelboards, disconnect switches, time switches, contactors, motor starters, pullboxes, cable tap boxes, etc. located in finished areas shall be painted out to match adjacent finish. Coordinate with Architect to confirm color prior to painting.

1. Refer to section 09 9000 Painting and Coating for requirements.

3.8 GROUNDING AND BONDING

A. Provide grounding and bonding for all electrical equipment in accordance with the applicable codes, rules and regulations. Permanently and effectively ground all raceway systems, supports, cabinets, panels, motor frames, lighting fixtures, grounding type receptacles and utilization apparatus. Obtain good contact between conduit, tubing and fittings, cabinets, outlet boxes, and equipment.

B. Provide bonding conductor in all branch circuit and feeder conduits. Bonding conductors shall be properly bonded to equipment at each end.

C. Provide a master ground bar on the wall in the main electrical room unless noted otherwise in the drawings.

1. Code size conductor bond to the building service ground systems per CEC Table 250.66.

D. Provide copper ground bar in each MDF and IDF internet technology rooms complete with stand-offs.

1. Conductor bond to the main building service ground or master ground bar size conductor per BICSI standards for distance.

E. 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.

3.9 EQUIPMENT MOUNTING AND SUPPORTS

A. Equipment, straps, boxes, etc., when anchored to masonry and concrete surfaces, shall be anchored with wedge type anchors, Hilti Kwik Bolt II.

B. Runs of conduit, raceway, and wireway shall be supported at intervals not to exceed five (5) feet on center.

C. Anchors shall be torque tested to the values specified in the drawing details. Structural details and torque values take precedence over those listed in the electrical drawings.

D. 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.

E. 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.

F. 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.

FIELD QUALITY CONTROL

A. Test all wiring and connections for continuity and grounds before any fixtures or equipment are connected and where such tests indicate faulty insulation or other defects, they shall be located, repaired and tested again at the Contractor's expense. Electrical loads shall be balanced at the panelboards and motors shall be checked for correct rotation.

B. After the installation is completed and at such time as Project Coordinator may direct, conduct an operating test for approval in accordance with NETA Standards. Demonstrate equipment to be in conformance with applicable Codes and operate in accordance with Requirements of this Section of the Specifications. Furnish all instruments and personnel required for test.

1. Make type written record of all readings and submit this record to Engineer. Replace circuits found to be below the minimum values of insulation resistance for the types of conductors as recommended by International Electrical Testing Association, (ATS) Acceptance Testing Specification - 2013 or newer, for new equipment, and (MTS) Maintenance Testing Specifications - 2015 or newer where portions of existing equipment will be subjected to testing voltages. Retest new cable and record.

C. Contractor will contract with an electrical testing company to perform the following applicable tests and submit test reports for the equipment specified in the drawings unless noted otherwise:

3.10 INSULATION RESISTANCE TEST SPECIFICATIONS – Cables – Low voltage to 600 volts maximum.

A. Visual and Mechanical Inspection

1. Inspect cables for physical damage and proper connection in accordance with single line diagram.
2. Test cable mechanical connections to manufacturer's recommended values with a calibrated torque wrench. In absence of manufacturer's data use Table 1.
3. Check cable color-coding with applicable engineer's specifications and National Electrical Code standards.

B. Electrical Tests

1. Perform insulation resistance test on each conductor including neutral with respect to ground and adjacent conductors before connecting to equipment. Applied potential to be 1000 volts dc for one (1) minute withstand test, per NETA ATS-2013.
2. Perform continuity test on all power equipment branch and feeder circuit conductors. Verify proper cable connection and phasing.

C. Test Values

1. Minimum insulation resistance values shall be not less than 50 megohms.

3.11 CONDUCTOR SPLICING

A. Visual Inspection

1. Inspect cables for physical damage and proper connection in accordance with single line diagram. Inspect conductor strands for scarring. Any scarring shall require the cutting of the cable/conductor end to remove the damaged strands.
2. Splices shall be tested in accordance with NETA 7.3.2.3 TEST VALUES, paragraph 3 “Microhm or millivolt drop values shall not exceed the high levels of the normal range as indicated in the manufacturer’s published data. If the manufacturer’s data is not available, investigate any values which deviate from similar connections by more than 50 percent of the lowest value.
    a.) In other words; test all of the splices and compare the values. Splices with test values that exceed 50 percent of the lowest value obtained shall be removed and the conductors re-spliced.
3. After the testing of the splice is complete and the application of the shrink insulation perform an “insulation-resistance test on each conductor with respect to ground and adjacent conductors” with an applied potential of 1000 volts per NETA 7.3.2.2 Electrical Tests and specification 26 00 00, section 3.
    a.) Per NETA 7.3.2.3.4 “minimum insulation-resistance values should not be less than 50 megohms.

Table 1

U.S. Standard

Bolt Torques for Bus Connections

Heat Treated Steel – Cadmium or Zinc Plated

GRADE	SAE	SAE	SAE	SAE
	1 & 2	5	6	8
Minimum Tensile (P.S.I.)	64K	105K	133K	150K
Bolt Diameter	Torque (Foot Pounds)			
1/4	4.0	5.6	8.0	8.4
5/16	7.2	11.2	15.2	17.6
3/8	12.0	20.0	27.2	29.6
7/16	19.2	32.0	44.0	48.0
1/2	29.6	48.0	68.0	73.6
9/16	42.4	70.4	96.0	105.6
5/8	59.2	96.0	133.6	144.0
3/4	96.0	160.0	224.0	236.8
7/8	152.0	241.6	352.0	378.4
1.	225.6	372.8	528.0	571.2

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Engineered fill materials.
2. Imported engineered fill material.
3. Landscape backfill material'
4. Aggregate base.

1.2 RELATED REQUIREMENTS

A. Document 01 5000, Temporary Facilities and Controls.

B. Section 01 5713, Erosion Control.

C. Section 31 2333, Trenching and Backfilling.

D. Section 32 1200, Asphalt Concrete Paving.

E. Section 32 1600, Site Concrete.

F. Section 33 4000, Storm Drainage Utilities.

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. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.

D. ASTM International (ASTM):

1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).

5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

F. CAL-OSHA, Title 8, Section 1590 (e).

G. Site survey: Included in the drawings, was prepared by Warren Consulting Engineers, and is the basis for data regarding current conditions. While the survey is deemed generally accurate, there exists discrepancies and variations due to elapsed time, weather, etc. Existing dirt grades may vary 0.2 ft. from that shown.

1.4 ADMINISTRATION 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. Site Visitation: All bidders interfacing with existing conditions shall visit the site prior to bid to verify general conditions of improvements. Discrepancies must be reported prior to the bid for clarification.

1.5 ACTION SUBMITTALS

A. Provide supplier’s descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor’s guarantee.

1.8 QUALITY ASSURANCE

A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.

B. Contractor shall be solely responsible for all subgrades built. Failures resulting from inadequate compaction or moisture content are the responsibility of the contractor. Contractor shall be solely responsible for any and all repairs.

C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following

completion of the project. Correcting of inadequate compaction or moisture content is the sole responsibility of the contractor.

D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

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. Tests (See Part 3, Article “Testing and Observation” for Compaction Testing).

1.9 DELIVERY, STORAGE AND HANDLING

A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

1.11 EXISTING SITE CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

B. Existing civil and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

A. Ground-breaking requirements:

1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.
2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager or Facilities Manager to procure the drawings.

B. Underground Utility Locating:

1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience. Contact Norcal Underground Locating (800/986-6722) or Precision Locating (800/577-7324)

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
    a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.
    b. All conduit pathways containing an active cable TV system.
    c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.
    d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.
    e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.
    f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure waive (signal) without damaging or triggering the existing systems.
    g. All copper or steel waterlines and plastic or steel gas lines.
6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.
7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.
8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.
9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.
10. Contractor shall inform the (District's Construction Manger)(Architect)(Owner) no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullying of sides of excavation.

E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.

F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

H. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

1.14 SEASONAL LIMITS

A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

B. Excessively wet fill material shall be bladed and aerated per Article “Subgrade Preparation”.

1.15 TESTING

A. General: Refer to Section 01 4523 - TESTING AND INSPECTION SERVICES, AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.

B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1. If Contractor elects to process or mine onsite materials for use as Suitable Fill, Aggregate Sub Base, Aggregate Base, Rock, Crushed Rock or sand the cost of all testing of this material shall be paid for by the Contractor.
2. Testing of import fill for compliance with Department of Toxic Substance Control (DTSC) shall be paid for by the Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than 3-inches in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding 3-inches in final size shall not be allowed in the upper 12 inches of any fill.

B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of 15 or less; an Expansion Index of 20 or less; be free of particles greater than three-inch (3") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.

1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with testing will be paid by the contractor.
2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory http://www.dtsc.ca.gov/Schools/upload/SMP FS Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.
3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.
4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	**Sampling Requirements**
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples

Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location

Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation
   a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.

C. Landscape Backfill Material:

1. The top 3" of native topsoil stripped from the site may be used for landscape backfill material.

D. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.

E. Aggregate Base: Provide Class 2 3/4" Aggregate Base conforming to standard gradation as specified in Cal Trans Standard Specifications, Section 26,-1.02A.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence

B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

C. Verify that specified items may be installed in accordance with the approved design.

D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 PERFORMANCE

A. GENERAL:

1. General: Do all grading, excavating and cutting necessary to conform finish grade and contours as shown. All cuts shall be made to true surface of subgrade.
2. Archaeological Artifacts: Should any artifacts of possible historic interest be encountered during earthwork operations, halt all work in area of discovery and immediately contact the Architect for notification of appropriate authorities.
3. Degree of Compaction: Percentage of maximum density, hereinafter specified as degree of compaction required, means density equivalent to that percentage of maximum dry density determined by ASTM D1557 Compaction Test method, and such expressed percentage thereof will be minimum acceptable compaction for specified work.
4. Moisture Content: Moisture content shall be as noted below and as called for on the plans. Moisture content shall be maintained until subgrade is covered by surfacing materials.

3.3 DEMOLITION, DISPOSAL AND DISPOSITION OF UNDESIRABLE MAN-MADE FEATURES

A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of 12", moisture-conditioned to near optimum moisture content, and recompacted to at least 90% of the maximum dry density.

3.4 TESTING AND OBSERVATION

A. All grading and earthwork operations shall be observed by the Geotechnical Engineer or his representative, serving as the representative of the Owner.

B. Field compaction tests shall be made by the Geotechnical Engineer or his representative. If moisture content and/or compaction are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified moisture or compaction. Notify Geotechnical Engineer at least 48 hours in advance of any filling operation.

C. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer or his representative. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.

D. If the Contractor should fail to meet the compaction or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory, as determined by the Geotechnical Engineer or Architect/Engineer.

E. After each rain event Geotechnical Engineer shall test fill material for optimum moisture. Do not place any fill material until desired moisture is achieved.

3.5 CLEARING AND GRUBBING

A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics.

3.6 CUTTING

A. Do all cutting necessary to bring finish grade to elevations shown on Drawings.

B. When excavation through roots is necessary, cut roots by hand.

C. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

3.7 STRUCTURAL EXCAVATION

A. General: Excavate to bear on firm material at contract depth shown on Drawings.

B. Footings: All footing excavations shall be of sufficient width for installation of formwork, unless earth will retain its position during concreting. All portions of footings above grade must be formed. In the event that footings are placed against earth, footing widths below grade shall be increased 2 inches from those shown on Drawings and positive protection shall be provided for top corners of trench.

C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to 90% of dry density.

3.8 SUBGRADE PREPARATION

A. Grade compact and finish all subgrades within a tolerance of 0.10' of grades as indicated on Drawings and so as not to pool water. Subgrade within building pads and concrete walks shall be within 0.05' of grades indicated.

B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least 12", until surface is free from ruts, hummocks or other uneven features. Moisture condition to least 2% above optimum moisture content and recompact to at

least 90% of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.

C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to (optimum) (2% above optimum) moisture content and compacted to not less than 90% of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.

D. Subgrade in areas to receive landscaping shall be compacted to (90%).

E. Where Contractor over-excavates building pads through error, resulting excavation shall be recompacted as engineered fill at Contractor's expense.

3.9 PLACING, SPREADING AND COMPACTING FILL MATERIAL IN BUILDING PAD AND PAVEMENT AREAS

A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content.

B. Selected fill material shall be moisture-conditioned to specified moisture content. Selected fill material shall be unfrozen. When moisture content of fill material is below that specified, add water until proper moisture content is achieved. When moisture content is above that specified, aerate by blading or other methods mentioned in 3.08 B until moisture content is satisfactory.

C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of 90% as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.

D. Recompaction of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to at least 2% above optimum moisture content, and compact to a minimum of 90% relative compaction in building pad and paved areas, and to 90% relative compaction in landscape areas.

E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

A. Concrete Flatwork: Upper 12" of all subgrades shall be uniformly compacted at specified moisture content to at least 90% of maximum dry density, as determined by ASTM D1557 Compaction Test, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.

B. Paved Areas: Upper 12" of all final subgrades supporting pavement sections shall be brought to specified moisture content and shall be uniformly compacted to not less than 95% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.

C. Other Fill and Backfill: Upper 12" of all other final subgrades or finish grades shall be compacted to 90% of maximum dry density.

D. Gravel Fill: Do not place compacted gravel fill until after underground work and foundations are in place. Compact gravel fill with vibratory plate or similar equipment to preclude settlement.

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to 90% maximum dry density, top soil shall be placed evenly to depth of 12" at 85% of maximum dry density.

B. Project Inspector must verify that materials are uniformly spread to minimum depth specified.

3.12 SLOPE CONSTRUCTION

A. Cut slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Fill slopes shall be constructed to no steeper than 2:1 (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of 2 horizontal to 1 vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

A. At completion of project, site shall be finished graded, as indicated on Drawings. Finish grades shall be "flat graded" to grades shown on the drawing. Mounding of finish grades will not be allowed unless otherwise directed on the landscape drawings. Tolerances for finish grades in drainage swales shall be +-0.05'. Tie in new and existing finish grades. Leave all landscaped areas in finish condition for lawn seeding. Landscaped planters shall be graded uniformly from edge of planter to inlets. If sod is

used for turf areas the finish grade on which it is placed shall be lowered to allow for sod thickness.

B. All landscape areas shall be approved by Architect prior to any planting.

3.14 SURPLUS MATERIAL

A. Excavated material not required for grading or backfill shall be removed from site at contractor's expense.

3.15 CLEANING

A. Refer to Section 01 7700.

B. Remove from fill all vegetation, wood, form lumber, casual lumber, and shavings, in contact with ground; buried wood will not be permitted in any fill.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Trench backfill materials.

1.2 RELATED REQUIREMENTS

A. Document 01 5000, Temporary Facilities and Controls.

B. Section 31 0000, Earthwork.

C. Section 33 4000, Storm Drainage Utilities.

1.3 REREENCES 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. California Plumbing Code (CPC), edition as noted on the drawings.

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. General Contractor shall coordinate work as herein specified, in accordance with drawings and as required to complete scope of work with all related trades.

1.5 ACTION SUBMITTALS

A. Provide supplier’s descriptive literature for all products to demonstrate compliance with specified attributes:

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For contractor / Installer.

1.7 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.

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. 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.

1.9 DELIVERY, STORAGE AND HANDLING

A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELDCONDITIONS

A. Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

B. Trench dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for trench dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled.

1.11 PROTECTION

A. Adequate protection measures shall be provided to protect workers and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations. Repair all trenches in grass areas with new sod (seeding not permitted) and "stake-off" for protection.

B. Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Any construction review of the Contractor's performance conducted by the Architect or Owner is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

D. Provide shoring, sheeting, sheet piles and or bracing to prevent caving, erosion or gullying of sides of excavation.

E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. Keep all excavations free from water during entire progress of work, regardless of cause, source or nature of water.

F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.

H. Trees: Carefully protect existing trees which are to remain.

1.12 TRENCH SAFETY PROVISIONS

A. General Contractor shall be solely responsible for safety design, construction and coordination with agencies having jurisdiction. If such plan varies from shoring system standards established by Construction Safety Orders, plan shall be prepared by registered civil or structural engineer.

B. Nothing herein shall be deemed to allow use of shoring, sloping or protective system less effective than that required by Construction Safety Orders of California State Division of Industrial Safety.

C. When trenching through paved surface, provide steel trench plates to cover open trenches daily until trenches are backfilled.

1.13 SEASONAL LIMITS

A. No backfill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, full operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

B. Material above optimum moisture shall be processed per Section 31 0000, Part 3, Article “Subgrade Preparation”.

1.14 TESTING

A. General: Refer to Section 31 0000, Part 1, Article “Testing” and Part 3, Article “Testing and Observation”.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Backfill materials: Pipeline and conduit trench backfill as shown on the plans and as specified below.

1. ¾ inch crush rock.

2. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than 3-inches.
3. Sand: Fine granular material, free of organic matter, mica, loam or clay.
4. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
5. Class 2 aggregate base, ¾" rock, per Caltrans Section 26-1.02B
6. Controlled Density Fill: 3 sack slurry backfill.

B. Water: Furnish all required water for construction purposes, including compaction and dust control. Water shall be potable.

C. Provide other bedding and backfill materials as described and specified in Section 33 0000, Section 33 4000 and Divisions 22 and 26.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Examine areas and conditions under which work is to be performed.
2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.2 INSTALLATION

A. Perform work in accordance with pipe manufacturer's recommendations, as herein specified and in accordance with drawings.

3.3 TRENCHING

A. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of trench around installed item as required for caulking, joining, backfilling and compacting; not less than 12 inches wider than pipe or conduit diameter, unless otherwise noted.

B. Carefully excavate around existing utilities to avoid unnecessary damage. The contractor shall anticipate and perform hand work near existing utilities as shown on the survey, without additional claims or cost.

C. Trench straight and true to line and grade with bottom smooth and free of edges or rock points.

D. Where depths are not shown on the plans, trench to sufficient depth to give minimum fill above top of installed item measured from finish grade above the utility as follows:

1. Sewer pipe: depth to vary
2. Storm drain pipe: depth to vary
3. Water pipe - Fire Supply: 36 inches

4. Water pipe – Domestic Supply: 30 inches

3.4 BACKFILL

A. Pipe Trench Backfill is divided into three zones:

1. Bedding: Layer of material directly under the pipe upon which the pipe is laid.
2. Pipe Zone: Backfill from the top of the bedding to 6 inches (compacted) over the top of the pipe.
3. Upper Zone: Backfill between top of Pipe Zone and to surface of subgrade.

B. Bedding: Type of material and degree of compaction for bedding backfill shall be as defined in the Details and Specifications.

C. Pipe Zone and Upper Zone Backfill:

1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.
2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.

D. Backfill Compaction:

1. Backfill shall be placed in layers which, when compacted shall not exceed 6 inches in thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity. Do not backfill over, wet, frozen or soft subgrade surfaces. Employ a placement method that does not disturb or damage foundation walls, perimeter drainage, foundation damp-proofing, waterproofing or protective cover.
2. When moisture content of fill material is below that required to achieve specified density, add water until proper moisture content is achieved. When moisture content is above that required, aerate by blading or other methods until specified moisture content is met; see Section 31 0000, Part 3, Article “Subgrade Preparation”.
3. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to 90% of maximum dry density while at specified moisture content. Compact each layer over its entire area until desired density has been obtained.
4. Compaction: All backfill operations shall be observed by the Inspector of Record and/or Geotechnical Engineer. Field density tests shall be made to check compaction of fill material. If densities are not satisfactory, Contractor will be required to change equipment or procedure or both, as required to obtain specified densities. Notify Inspector and Architect at least 24 hours in advance of any operation.

E. Backfill in Areas Previously Lime or Cement Treated

1. Where trenching occurs in areas that have been lime or cement treated, class 2 aggregate bases or approved controlled density backfill material shall be used for the top 12-inches minimum of the trench or thickness shall match the depth of treated material.

3.5 TRENCH AND SITE RESTORATION

A. Finished surface of trenches shall be restored to a condition equal to, or better than the condition as existed prior to excavation work.

3.6 PROTECTION

A. Protect existing surfaces, structures, and utilities from damage. Protect work by others from damage. In the event of damage, immediately repair or replace to satisfaction of Owner.

B. Repair existing landscaped areas to as new condition. Replant trees, shrubs or groundcover with existing materials if not damaged or with new materials if required. Replace damaged lawn areas with sod, no seeding will be permitted.

C. Replace damaged pavement with new compatible matching materials. Concrete walks to be removed to nearest expansion joint and entire panel replaced. Asphalt to be cute neatly and replaced with new materials.

D. Any existing materials removed or damaged due to trenching to be returned to new condition.

3.7 SURPLUS MATERIAL

A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site.

3.8 CLEANING

A. Refer to Section 01 7700.

B. Contractor will keep the work areas in a clean and safe condition so his rubbish, waste, and debris do not interfere with the work of others throughout the project and at the completion of work.

C. After completion of work in this section, remove all equipment, materials, and debris. Leave entire area in a neat, clean, acceptable condition.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aggregate.
2. Asphalt paving.
3. Seal coat.
4. Wood headers and stakes.
5. Pavement marking.
6. Precast concrete bumpers.

1.2 RELATED REQUIREMENTS

A. Document 01 5000, Temporary Facilities and Controls.

B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

C. Section 31 0000, Earthwork.

D. Section 31 2333, Trenching and Backfilling.

E. Section 33 4000, Storm Drainage Utilities.

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. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.

D. ASTM International (ASTM):

1. D698-00 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

4. D6628-16 Standard Specification for Color of Pavement Marking Materials.
5. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications.

F. CAL-OSHA, Title 8, Section 1590 (e).

1.4 ADMINISTRATION 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.

1.5 ACTION SUBMITTAS

A. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

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. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits 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 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.8 QUALITY ASSURANCE

A. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.

B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction is the responsibility of the contractor.

C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.

D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

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. Contractor shall provide verification that asphalt mix temperature meets the requirements of this specification at time of application.

G. Tests (See Part 1, Article "Testing").

1.9 DELIVERY, STORAGE AND HANDLING

A. Transport, store and handle in strict accord with the local jurisdiction.

1.10 FIELD CONDITIONS

A. Environmental Requirements:

1. Base Course: Do not lay base course on muddy subgrade, during wet weather, or when atmospheric temperature is below 40 degrees F.
2. Asphalt Surfacing: Do not apply asphaltic surfacing on wet base, during wet weather, or when atmospheric temperature is below 50 degrees F.

1.11 EXISTING SITE CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.12 PROTECTION

A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Any construction review of the Contractor's performance conducted by the owner's representative is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

D. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.

E. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

F. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

1.13 SEASONAL LIMITS

A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.14 TESTING

A. General: Refer to Section 01 4523 – TESTING & INSPECTION SERVICES AND STRUCTURAL TESTS AND INSPECTIONS LIST, DSA-103.

B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

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. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

A. Sterilant: Soil sterilizer shall be CIBA GEIGY's Pramatol 25-E, Treflan EC or Thompson-Hayward Casoron.

1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.

B. Base Course Aggregate: State Specifications, Section 26, Class 2 aggregate base (3/4" max.).

C. Asphalt Binder: Steam-refined paving asphalt conforming to State Specifications, Section 92, viscosity grade PG 64-10. Asphalt binder additives for HMA per Caltrans approved list of manufacturers.

D. Liquid Asphalt Tack Coat: Per CALTRANS section 94.

E. Surface Course Aggregate: Mineral aggregates for Type "B" asphalt concrete, conforming to State Specifications 39-2.02, Type B, ½" maximum, medium grading. 3/8" maximum grading at Playcourt.

F. Seal Coat: shall be a pre-mixed asphalt emulsion blended with select fillers and fibers such as:

1. "Park-Top No. 302", Western Colloid Products.
2. "Overcoat", Reed and Gram.
3. "Drivewalk", Conoco Oil.

G. Wood Headers and Stakes: Pressure treated.

H. Pavement Marking: Colors as directed by Architect. Colors of painted traffic stripes and pavement markings must comply with ASTM D6628.

1. Waterborne traffic line - colors white, yellow and red, State specification PTWB-01R3.
2. Waterborne traffic line for the international symbol of accessibility and other curb markings – blue, red and green, Federal specification TT-P-1952F.

I. Precast Concrete Bumpers: 3000 psi at 28 day minimum strength; 48" length unless otherwise indicated; provide with steel dowel anchors and concrete epoxy.

J. Pavement Epoxy; K-Lite; Ktepx-590; Ennis Epoxy HPS2 or an approved equal.

K. Crack Filler; QPR model CAR08, 10oz asphalt crack filler; Star STA-FLEX Trowel Grade crack filler or approved equal.

L. Reclaimed Asphalt Paugment (RAP). HMA Type A or Type B may be produced using RAP providing it does not exceed 15% or the aggregate blend.

2.3 MIXES

A. General: Plant mixed conforming to State Specifications, Section 39, Type B, ½" maximum, medium grading. 3/8" maximum grading shall be used at hardcourt.

B. Temperature of Hot Mix Asphalt: Not less than 275 degrees F nor more than 325 degrees F when added to aggregate.

C. Temperature of Hot Mix Aggregate: Not less than 250 degrees F nor more than 325 degrees F when asphalt is added.

D. Temperature of Hot Mix Asphalt Concrete: Asphalt shall be not less than 285 degrees at time of application, nor more than 350 degrees. Asphalt not meeting the required temperature shall not be used.

E. Temperature of Warm Mix Asphalt: Mixing and placement; per the approved manufactures heat range recommendations for mixing and placement.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Conditions of Work in Place: Subsurfaces which are to receive materials specified under this Section shall be carefully examined before beginning work hereunder, and any defects therein shall be reported, in writing, to the Architect. Work shall not be started until such defects have been corrected. Starting of work shall imply acceptance of conditions as they exist.

3.2 PREPARATION

A. Sub-Grade: Clean, shape and compact to hard surface free from elevations or depressions exceeding 0.05' in 10' from true plan. Compact per Section 31 0000. Compaction and moisture content shall be verified immediately prior to placement of aggregate base. Proof roll subbase in presence of geotechnical engineer prior to placement of aggregate base.

3.3 INSTALLATION

A. Headers:

1. General: Install as edging to asphalt paving, except where adjoining existing pavement, concrete curbs, walks or building.
2. Existing Headers: Remove existing headers where new paving will join existing. Saw cut existing asphalt to provide clean edge.
3. Lines and Levels: Install true to line and grade. Cut off tops of stakes 2-inches below top of header so they will not be visible on completion of job.

B. Asphalt Paving:

1. Base Course: Install in accord with State Specifications, Section 26. Compact to relative compaction of not less than 95%, ASTM D1557. The material shall be deposited on the subgrade in such a manner as to provide a uniform section of material within five percent tolerance of the predetermined required depth. Deposition will be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the subgrade shall have sufficient moisture which, in the opinion of the Architect is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted. If in the opinion of the site geotechnical engineer, the material is unsuitably segregated, it shall be removed or completely reworked to provide the desired uniformity of the material.
    a. Moisture content and compaction of base material shall be tested immediately prior to placement of asphalt paving.
2. Sterilant: Apply specified material at manufacturer's recommended rate. Applicator of sterilant material shall be responsible for determining location of all planter areas. Apply specified material over entire base course area just prior to application of asphalt. Follow manufacturer's printed directions.
3. Liquid Asphalt Tack Coat: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed.
4. Asphalt Concrete Surface Course:
    a. Comply with State Specifications, 39-6 except as modified below.
        1) Final gradation shall be smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of 91% of the theoretical maximum specific gravity determined by California Test Method #309. Maximum variation 1/8 inch in 10' when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix. In no case shall accessible parking spaces or loading and unloading areas exceed 2% slope in any direction.
        2) Asphalt material shall be delivered to the project site in a covered condition to maintain acceptable temperature.
5. Placement and adjustment of Frames, Covers, Boxes and Grates: The Contractor shall set and adjust to finish grade all proposed and existing frames, covers, boxes, and grates of all manholes, drop inlets, drain boxes, valves, cleanouts, electrical boxes and other appurtenant structures prior to placement of asphaltic concrete.
6. Water Testing: All paved areas shall be water tested, to check drainage, in the presence of the project inspector prior to placement of seal coat. The surface of asphalt paving shall not vary more than 1/8 inch above or below the grade established on the plans. If variations in grade are present, they will be corrected by overlaying paving and/or pavement removal and replacement as directed by the Architect.
7. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. In trenches; grind existing asphalt on each side of trench 3” wide x ½ the

depth of the section. Apply tact coat to vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Sawcut, remove and patch existing paving where cutting is necessary for installation of piping or conduits under Divisions 15, 16 and 33.

8. Seal Coat:
   a. Seal coat shall be applied no sooner than 30 days from time of asphalt placement.
   b. Surface Preparation: surface and cracks shall be clean of all dirt, sand, oil or grease. All cracks shall be filled to a level condition after curing. Make multiple fill applications until a level condition is achieved. Failure to do so will be the reason for rejection. Hose down entire area with a strong jet of water to remove all debris. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted hot mix asphalt concrete as specified herein. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.
   c. Seal Coat Seal Application: Thoroughly mix materials in the presence of the onsite inspector. Failure to do so will be cause for rejection. Apply in accordance with manufacturer's written instructions.
      a. The minimum application rate for each applied coat shall be 30gals per 1000 sq. ft. Two coats of sealcoat will be required.
      b. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.
   d. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.

C. Pavement Marking: painted pavement markings shall be done only after the seal coat has thoroughly dried. On clean surfaces to be painted with traffic paint of dust, dirt, grime, oil, rust or other contaminants which will impair the quality of work or interfere with proper bond of paint coats. Surfaces shall be cleaned to the extent and by whatever means that will satisfactorily accomplish the purpose without damage to asphalt concrete. Provide measured layouts, temporary markings, templates, and other means necessary to provide required marking. Prepare and apply paint in accordance with manufacturer’s instructions; paint shall be applied by spray and shall achieve complete coverage free from voids and thin spots. Where indicated on the Drawings, paint parking stall strips, lettering, arrows, accessible symbols, playground markings, game striping, maps, etc. on concrete paving or asphalt concrete paving. Paint stripes shall be 4 inches wide (except otherwise indicated) and applied with two (2) coats of herein specified Traffic Line Paint; white (except as otherwise specified or indicated).

1. International Accessible Symbol: Symbol shall be white figures on a blue background. Blue shall be equal to color No. 15090 in Fed. Std. 595c. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square. Tolerances: Apply striping within a tolerance 1/2 inch in 50 feet. Apply markings and striping to

widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

D. Colors: As directed by Architect

E. Precast Concrete Bumpers: Install where shown, using steel dowels, and epoxy applied for length to wheel stop without damage to bumpers or asphalt concrete paving.

3.4 CLEANING

A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

B. Clean excess material from surface of all concrete walks and utility structures.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete curbs and gutters.
2. Concrete pavement, sidewalks and ramps.
3. Steel reinforcing for flatwork and curbs.
4. Truncated domes.

1.2 RELATED REQUIREMENTS

A. Section 01 4523, Testing & Inspection Services.

B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

C. Division 31, Earthwork.

D. Section 32 1200, Asphalt Concrete Paving.

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. American Concrete Institute (ACI):

1. 117: Specification for Tolerances for Concrete Construction and Materials and Commentary.
2. 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
3. 301: Specifications for Structural Concrete.
4. 302.1R: Guide to Concrete Floor and Slab Construction.
5. 305R: Guide to Hot Weather Concreting.
6. 306R: Guide to Cold Weather Concreting.
7. 308R: Guide to External Curing of Concrete.
8. 318: Building Code Requirements for Structural Concrete and Commentary.
9. 347R: Guide to Formwork for Concrete.

D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
3. C33/C33M: Standard Specification for Concrete Aggregates.
4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
6. C150C150M: Standard Specification for Portland Cement.
7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
12. C920: Standard Specification for Elastomeric Joint Sealants.
13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.

E. Concrete Reinforcing Steel Institute (CRSI):

1. Manual of Standard Practice.
2. Placing Reinforcing Bars.

F. State of California, Department of Transportation (Caltrans):

1. Division of Engineering Services:
   a. California Test 342: Method of Test for Surface Skid Resistance with the California Portable Skid Test.
2. Standard Specifications.
   a. Section 51, Concrete Structures.
   b. Section 52, Reinforcement.
   c. Section 73, Concrete Curbs and Sidewalks.
   d. Section 90, Concrete.

G. US Government General Services Administration (GSA/SAE):

1. GSA/SAE AMS-STD-595A: Colors Used In Government Procurement.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action 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.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Joint pattern layout for walks and pavement.

B. Product Data:

1. A complete list of materials proposed to be used for the site concrete work including, but not limited to, sand, gravel, admixtures, surface treatments, coloring agents, sealers, cast-in-place accessories, forming and curing products, concrete mix designs, reinforcing materials, joint materials, curing materials, and detectable warning surface.
2. Manufacturer's descriptive literature for products proposed for use. Include installation instructions, and maintenance instructions.

C. Concrete Mix Design: The Contractor shall submit three copies of each proposed mix design for each class of concrete in accordance with ACI 301, Sections 3.9 "Proportioning on the Basis of Previous Field Experience or Trial Mixture," or 3.10 "Proportioning Based on Empirical Data." The Contractor shall submit a separate mix design for concrete to be placed by pumping, in addition to the mix design for concrete to be placed directly from the truck chute.

1. The following information shall be included in the concrete mix design:
   a. Proportions of cement, fine and coarse aggregate, and water.
   b. Water-cement ratio, 28-day compressive design strength, slump, and air content.
   c. Type of cement and aggregate.
   d. Special requirements for pumping.
   e. Range of ambient temperature and humidity for which design is valid.
   f. Special characteristics of mix, which require precautions in mixing, placing, or finishing techniques to achieve specified finished product.
2. Do not begin concrete production until mixes have been reviewed and approved by Engineer.
   a. Review of mix design by the Architect and Engineer shall in no way relieve the subcontractor of his responsibility for the performance of the concrete.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer

B. Delivery tickets as specified for ready-mixed concrete.

C. Sustainable Design:

1. 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. Paints and Coatings: 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. Manufacturer of ready-mixed concrete products shall meet ASTM C94/C94M requirements for production facilities and equipment.

B. Design, erect, support, brace and maintain formwork and shoring to safely support all loads that might be applied until such loads can be carried by concrete.

C. The Contractor shall perform work in accordance with ACI 301.

D. Use only new materials and products.

E. Single-Source Responsibility: Use materials and products of one manufacturer whenever possible.

F. 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.

G. Testing to determine compliance with the work of this Section will be the responsibility of the Contractor.

1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.
2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.
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.

H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and

Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.

I. Mockups: Provide on-site mockup panels for each type of exposed colored concrete flatwork showing texture and color before proceeding with finish to be used on this Project.

1. Construct sample panels after review and approval of samples.
2. Size: Minimum 5 feet square and have at least one longitudinal and one transverse joint unless a more specific note indicates otherwise on Drawings.
3. Construct sample panels at location approved by Architect.
4. Construct sample panels in ample time to allow for finishing and curing before requesting Architect to review.
5. Follow procedures used on accepted samples.
6. Include saw-cut and tooled joints to match method and appearance proposed for use in completed work.
7. Prepare successive sample panels as required until finish, color, and appearance is approved by Architect.
8. Do not remove sample panels until authorized in writing by the Architect and all concrete work has been approved.

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 weather tight 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 stock pile.

1.10 FIELD CONDITIONS

A. Make and be responsible for all field dimensions necessary for proper fitting, slopes, and completion of work. Report discrepancies to Architect before proceeding.

B. Do not place concrete during rain without adequate protection.

C. The Contractor shall conform to ACI 306R when mixing and placing concrete during cold weather. Provide sufficient protection when daily temperatures drop below 40 degrees F.

D. The Contractor shall conform to ACI 305R when mixing and placing concrete during hot weather. When air temperature exceeds 100 degrees F adjust concrete mix with retarding admixture in design mix, and adequately test and take additional measures as directed by concrete supplier.

E. The Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Use temporary striping, flagmen, barricades, warning signs, and warning lights as required.

F. Placing in hot weather: Comply with ACI 305R. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking.

1. Concrete shall not exceed 85 degrees F at time of placement.
2. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.
3. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 pounds per square foot per hour, before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

G. Placing in Cold Weather: Comply with ACI 306R. Protect from frost or freezing. No antifreeze admixtures are permitted.

1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
2. 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.
3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Contractor shall comply with requirements applicable to this Section for concrete materials, admixtures, bonding materials, curing materials, surface sealers and others as required.

B. Concrete walking surfaces shall have a coefficient of friction not less than 0.30 and will be subject to testing to verify compliance as specified in Article FIELD QUALITY CONTROL.

1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement.
2. Contractor shall notify the Architect and Project Inspector of pavement having a coefficient of friction less than 0.30.

C. Sustainable Design:

1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits 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 FORMING MATERIALS

A. Form Material: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with non-staining type coating that will not discolor or deface surface of concrete.

1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or “Sonotube” forms by Sunoco, 888-875-8754, or equal.
2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.

B. Form Ties: Snap off metal of fixed length, leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than 1 inch diameter; manufactured by Burke, Dayton Superior, or equal.

C. Spreaders: Metal. Wood is not permitted.

D. Form Coating: Coat forms with non-staining material that will not discolor or deface surface of concrete or leave any residue on concrete that would interfere with surface coating as approved by the Architect.

E. Chamfer Strips: Rigid polyvinyl chloride, 3/4-inch x 3/4-inch, in maximum possible lengths, manufactured by Burke, Greenstreak, Vulco, or equal.

2.3 REINFORCING MATERIALS

A. Reinforcement Bars: New billet steel deformed bars conforming to requirements of ASTM A615/A615M or ASTM A706/A706M; Grade 60.

1. Bars for dowels installed through expansion joints or construction joints to existing sidewalks or concrete features shall be smooth or if deformed shall be sleeved on one end for slippage.

B. Reinforcing Supports: Galvanized metal chairs or spacers or metal hangers, accurately placed 3 feet on center each way, staggered, with each support securely fastened to steel reinforcement in place.

1. Bottom bars in footings may be supported with 3-inch concrete blocks with embedded wire ties.
2. Concrete supports without wire ties will not be allowed.

2.4 CONCRETE MATERIALS

A. Cement: Portland cement in accordance with ASTM C150/C150M, Type II, low alkali.

B. Concrete Aggregates: Graded from coarse to fine in accordance with ASTM C33/C33M.

1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.
    a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.
2. Lightweight Aggregates:
    a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.
    b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.

C. Water: Potable, clean, and in accordance with ASTM C94/C94M, free from injurious amounts of oil, acids, alkalis, salts, scale, organic materials or other deleterious matter, and in compliance with ACI 318 Section 26.4.1.3.

D. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials and in accordance with CBC Section 1903A.6.

1. Class C is not permitted.
2. Proportions: Not more than 15 percent (by weight) may be substituted for portland cement.

2.5 ADMIXTURES

A. Water Reducing Admixture: Admixture to improve placing, reduce water cement ratio and ultimate shrinkage; “WRDA 64” by GCP Applied Technologies, or equal conforming to ASTM C494/C494M and ACI 318 Section 3.6.

1. Water reducing admixture may be used subject to prior approval by the Architect, Engineer, and the Testing Lab.
2. Proposed product and quantity shall be included in original design mix.

B. Air-Entraining Admixture: “Daravair 1000” by GCP Applied Technologies or equal conforming to ASTM C260 and ACI 318, section 26.4.1.4.

1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.
2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.

C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; “Chromix L10 Base-Black” by Sika Corporation, or equal.

2.6 CURING MATERIALS

A. Clear Curing Compound: Water-based membrane-forming concrete curing compound in accordance with ASTM C309 and C1315; “Aqua Resin Cure Clear” by Burke CO, “1100” by W.R. Meadows, or equal.

2.7 ADDITIONAL MATERIALS AND COMPONENTS

A. Concrete Bonding Agent: The following, or equal, conforming to ASTM C1059/C1059M.

1. “Weld-Crete” by Larson Products Corporation, 800-633-6668.
2. “Daraweld C” by GCP Applied Technologies, 877-423-6491.

B. Patching Mortar: One-component, trowel applied, migrating-corrosion-inhibitor enhanced, polymer-modified, shrinkage-compensated, fiber reinforced, micro-silica enhanced, cementitious repair mortar for horizontal, vertical, and overhead applications; “Meadow-Crete GPS” by W.R. Meadows, or equal.

C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; “MasterFlow 713” by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.

D. 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 the Geotechnical Engineer.

E. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.

1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.

F. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.

1. Self-Leveling: “DOWSIL 890-SL Silicone Joint Sealant” by Dow Chemical Company, or equal.
2. At Slopes Exceeding 5 Percent: Non-sagging; “DOWSIL 888 Silicone Joint Sealant” by Dow Chemical Company, or equal.
3. Color: As standard with manufacturer.

G. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; “Snap Cap” by W. R. Meadows, Tex-Trude expansion caps, or equal.

H. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; “Armor-Tile”, “Access Tile Tactile Systems,” or equal.

1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.

2.8 CONCRETE DESIGN AND CLASS

A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.

1. Class “B”: Concrete shall have 1 inch maximum size aggregate, shall have 3000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
   a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
   a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class “B”.

B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.

C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.
2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.

D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.

E. Glare Reduction Additive:

1. General:
   a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
   b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.

2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
3. Add colorant to mix in accordance with manufacturer's printed instructions.

F. Coloring Agent:

1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.9 MIXING OF CONCRETE

A. Conform to requirements of CBC Chapter 19A.

B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.

C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.

1. Furnish batch certificates for each batch discharged and used in the work.
2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.
3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent’s file. Delivery tickets must indicate the following information or be subject to rejection:
    a. Name of Project.
    b. Supplier of concrete.
    c. Truck identity and ticket serial number.
    d. Date of delivery.
    e. Brand of cement.
    f. Cement content.
    g. Strength classification.
    h. Batching time.
    i. Point of deposit.
    j. Total amount of water.
    k. Weight of aggregate.
    l. Daily temperature.

m. Number of cubic yards in load.
n. Admixture content.
o. Name of Contractor.
p. Name of driver.
q. Time loaded and first mixing of concrete.
r. Reading of revolution counter.
s. Color additive.

5. 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.
6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
   a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
   b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.
   a. The quantity of water used for each batch shall be accurately measured.
   b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.

B. Verify that gradients and elevations of the base are correct, and that the base is dry.

C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.

   1. Do not proceed with work until unsatisfactory conditions have been corrected.

D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

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 and equipment, and remove debris from areas to receive concrete.

D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.

E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

3.3 INSTALLATION – FORMWORK

A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.

B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.

C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.

E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.

F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.

1. Seal all cut edges.
2. Before re-using form material, inspect, clean thoroughly, and recoat.

G. Slope tie-wires downward to outside of wall.

H. Brace, anchor and support all cast-in items to prevent displacement or distortion.

I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.

J. Concrete Paving, Curbs, Curb and Gutters, Ramps:

1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is 20 feet for exterior concrete unless otherwise shown. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at 60 feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
4. Exterior Concrete Paving: Install expansion joints at 20 feet on center maximum, both directions, unless shown otherwise on plans.
5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
    a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
    b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.

K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.4 INSTALLATION – REINFORCING

A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.

B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.

1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.

C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.

D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.

E. Placing Tolerances:

1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.

F. Splices:

1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
   a. Length of Lap Splices in Concrete:
      1) No. 4 bar: 24 inches minimum.
      2) No. 5 Bar: Not less than 62 bar diameters.
      3) No. 6 Bar: 56 inches minimum.
      4) No. 7 Bars and Larger: Not less than 93 bar diameters.
   b. All splices shall be staggered at 5 feet minimum from adjacent splices.

G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.5 PLACING OF CONCRETE – GENERAL

A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.

B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.

C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.

D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.

E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. 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. Free fall of concrete shall not to exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.

F. Remove form spreaders as placing of concrete progresses.

G. Place footings as monolithic and in one continuous pour.

H. Compacting: Concrete shall be compacted 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 or be continued so long as to cause segregation of materials.

3.6 REMOVAL OF FORMS

A. Remove without damage to concrete surfaces.

1. Sequence and timing of form removal shall insure complete safety of concrete structure.
2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
    a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
    b. Concrete Paving Edge Screeds or Forms: 7 days.
3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.

B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.7 CONCRETE PAVING

A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.

B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.

C. Thoroughly water and soak the subgrade of exterior concrete paving, curbs, curb and gutters, with multiple daily waterings for at least three days or as required to achieve required moisture content prior to the concrete pour in order to place the subgrade soils in full expansion.

1. Provide damming as required to keep standing water within the formed area and to allow for proper saturation and full expansion of the subgrade soils.
2. Remove standing water before concrete placement.

D. 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.

3.8 FINISHING

A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.

1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
2. Use “jitterbugs” or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
3. After tamping the concrete, wood float surface to a true and even plane.
4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.
5. While concrete is still wet but sufficiently hardened to bear a persons’ weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
8. Provide final finish as follows, unless otherwise indicated:
    a. Medium Broom Finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.

B. Curb Finish: Steel trowel.

C. Joints and Edges:

1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

D. Exposed Concrete Surface Finishing, Not Including Top Surface of Flatwork:

1. Remove fins and rough spots immediately following removal of forms from concrete which is to be left exposed. Damaged and irregular surfaces and holes left by form clamps and sleeves shall be patched with grout.
2. Tie wires are to be removed to below exposed surface and holes pointed up with neat cement paste similar to procedure noted under "After patching" in subparagraph below.
    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 other, unexposed locations.
    c. Care shall be taken during pointing to match adjacent finishes of exposed concrete surface.
3. 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.
    c. Entire finishing operation of an area shall be completed on the same day. This treatment shall be carried to 4 inches below grade, and all patching and sacking shall be done immediately upon removal of the forms.

E. Stair Treads and Risers: Tool exterior stair tread and landing nosings to comply with ADA and CBC accessibility requirements and as detailed.

1. Nosings shall contain no pockets, voids or spalls. Patching is not allowed. Damaged nosings shall be replaced.

3.9 CURING

A. Formed Concrete:

1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.

2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.

B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:

1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.

C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.10 DEFECTIVE CONCRETE

A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
   a. Defective concrete shall be removed from the site.
   b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
   c. 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.
   d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. 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, transverse 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, or outside of the maximum tolerance for flatness and slopes indicated.
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 with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.

9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

3.11 INSTALLATION OF TRUNCATED DOMES

A. General:

1. Comply with manufacturer’s installation instructions as summarized in the Article.
2. Verify concrete to receive embedded truncated dome tiles is within the slump range recommended by tile manufacturer to permit placement without mix causing tiles to float.
3. Maintain factory-installed plastic sheeting during installation process to prevent splashing of concrete onto the finished surface of the tile.
4. If necessary to ensure that adjacent tiles are flush to each other during the installation process, bolt tiles together using 1/4 inch or equivalent hardware or other methods recommended by tile manufacturer.

B. The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. Immediately after finishing concrete, the electronic level should be used to check that the required slope is achieved.

C. Installing Tiles:

1. Install tiles into fresh concrete using techniques that will eliminate air voids under the tile.

a. Holes in the tile perimeter allow air to escape during the installation process.

b. Allow concrete to flow through holes in embedment flanges on underside of tile to lock tile solidly into the cured concrete.

2. Tiles shall be placed true and square.

3. Tiles shall be tamped or vibrated into the fresh concrete to ensure that the field level of the tile is flush to the adjacent concrete surface to permit proper water drainage and eliminate tripping hazards between adjacent finishes.

D. Immediately after placement, the tile elevation shall be checked with the elevation and slope permitting water drainage, to ensure that the field surface of the tile is flush with the surrounding concrete, and that no ponding is possible on the tile.

E. While concrete is still workable, a 3/8 inch radius edging tool shall be used to create a finished edge of concrete, then a steel trowel shall be used to finish the concrete around the tile's perimeter, flush to the field level of the tile.

F. If necessary, adjust tile before the concrete sets. Use two suitable weights of 25 pounds each if necessary to ensure solid contact of the underside of tile to concrete.

G. During and after the tile installation and the concrete curing stage, prohibit walking, leaning, or placing of other external forces on tile that may rock the tile causing a void between the underside of tile and concrete.

H. After concrete is cured, remove factory-applied protective plastic wrap and concrete that may have bled under the plastic following procedures recommended by the tile manufacturer.

I. Protect tiles after installation and during remainder of construction period.

J. Prior to Owner acceptance, clean tiles complying with manufacturer's procedures for cleaning of tile surface.

3.12 SEALANT

A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.

B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.

C. Finished joints shall be straight, uniform, smooth, and neatly finished.

D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.13 FIELD QUALITY CONTROL

A. Inspection of Forms and Reinforcing:

1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.

B. Testing of Concrete:

1. Frequency and Samples for Testing:
   a. 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.
   b. 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. Testing:
   a. Slump: Each truck's concrete shall be tested for slump before concrete is placed.
   b. Strength:
      1) Tests for strength will be conducted by Testing Agency 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.
      2) On a given project, if the total volume of concrete is such that the frequency of specified testing 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.

C. Slip-Resistance Testing: Owner's Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.

1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.14 CLEANING

A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

B. Clean excess material from surface of all concrete walks and utility structures.

C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.

D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.15 PROTECTION

A. Graffiti-resistant Coating:

1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
2. Concrete must be clean, dry, and free of efflorescence and dust.

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 during construction, 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. Summary Includes:

1. Storm drainage piping systems.

1.2 RELATED REQUIREMENTS

A. Document 01 5000, Construction Facilities and Controls.

B. Section 01 6116, Volatile Organic Compound (VOC) Restrictions, for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

C. Section 31 0000, Earthwork.

D. Section 31 2333, Trenching and Backfilling.

E. Section 32 1200, Asphalt Concrete Paving.

F. Section 32 1600, Site 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. California Plumbing Code, (CPC), edition as noted on the Drawings.

D. Local Jurisdiction: Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.

E. ASTM International (ASTM):

1. D 422-63 Test Method for Particle Size Analysis of Soil.
2. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
3. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

5. D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

F. CALTRANS Standard Specifications.

G. CAL-OSHA, Title 8, Section 1590 (e).

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. Provide supplier's descriptive literature for all products to demonstrate compliance with specified attributes.

B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: Contractor / installer.

B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.

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. Paints and Coatings: 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. Contractor / Installer shall have been in business for five (5) years providing/finishing similar size projects and complexity.

B. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.

C. The representatives of the Owner's testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner's testing lab representatives nor the testing by the Owner's testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.

D. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

1. Sun damaged or discolored PVC pipe will be rejected.

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.

1.9 DELIVERY, STORAGE AND HANDLING

A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations

B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.10 EXISTING SITE CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

B. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.11 PROTECTION

A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullying of sides of excavation.

E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.

F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

H. Trees: Carefully protect existing trees that are to remain.

1.12 SEASONAL LIMITS

A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.13 TESTING

A. General: Refer to Section 01 4523 – Testing and Inspection Services, and Structural Tests and Inspections List, DSA-103.

B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.14 RECORD DRAWINGS

A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.

C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.

D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

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. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 6116.

2.2 MATERIALS

A. Pipe: Use one of the following, unless noted on the Drawings otherwise.

1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.
2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12” to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.

B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe

C. Manhole: Shall be as shown on the drawing details.

D. Drop Inlet: Shall be as shown on the drawing details.

E. Curb Inlet: Shall be as shown on the drawing details.

F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.

G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.

H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.

I. Area Drains: Shall be as shown on the drawing details.

J. Floor Drains: Shall be as shown on the drawing details.

K. Clean-outs: Shall be as shown on the drawing details.

L. Planter drains: Shall be as detailed on the drawing details.

M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.1 INSPECTION LAYOUT AND PREPARATION

A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence

B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

C. Verify that specified items may be installed in accordance with the approved design.

D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.2 EXCAVATION AND BACKFILLING

A. General: Installation shall be in strict conformance with referenced standards, the manufacturer’s written directions, as shown on the drawings and as herein specified.

B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.

C. Excavation and Bedding:

1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer’s recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.
2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.

3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be installed prior to any lime treatment operations.
    a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.
3. Pipe shall be bedded uniformly throughout its length.
4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.
5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.
2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 31 2333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

H. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.3 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas +- 0.05’.
2. In sidewalk and asphalt pavement +-0.025’.
3. In curb and gutter application +-0.0125’.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, +-0.05’.

2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, +- 0.025'.

3.4 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no additional cost to the owner.

3.5 FLUSHING

A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.6 CLEANING

A. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

B. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

END OF SECTION

Attachment AD0A.23

Earl Warren ES - 02-120000

Statement of General Conformance

THE FOLLOWING DRAWINGS OR SHEETS LISTED ON THE COVER OR INDEX SHEET HAVE BEEN PREPARED BY OTHER DESIGN PROFESSIONALS OR CONSULTANTS WHO ARE LICENSED AND/OR AUTHORIZED TO PREPARE SUCH DRAWINGS IN THIS STATE. IT HAS BEEN EXAMINED BY ME FOR:

1) DESIGN INTENT AND APPEARS TO MEET THE APPROPRIATE REQUIREMENTS OF TITLE 24, CALIFORNIA CODE OF REGULATIONS AND THE PROJECT SPECIFICATIONS PREPARED BY ME, AND
2) COORDINATION WITH MY PLANS AND SPECIFICATIONS AND IS ACCEPTABLE FOR INCORPORATION INTO THE CONSTRUCTION OF THIS PROJECT.

THE STATEMENT OF GENERAL CONFORMANCE "SHALL NOT BE CONSTRUED AS RELIEVING ME OF MY RIGHTS, DUTIES, AND RESPONSIBILITIES UNDER SECTIONS 17302 AND 81138 OF THE EDUCATION CODE AND SECTIONS 4-336, 4-341, AND 4-344" OF TITLE 24, PART 1. (TITLE 24, PART 1, SECTION 4-317 (b))

SIGNATURE

4/21/22
DATE

ARCHITECT OR ENGINEER DESIGNATED TO BE IN GENERAL RESPONSIBLE CHARGE

Jeffrey Grau
PRINT NAME

C-14648
LICENSE NUMBER

05/31/23
EXPIRATION DATE

LIST COMPLETELY, ITEMS REVIEWED AND ACCEPTED:

PC SHADE STRUCTURE

Elder Creek ES - 02-120002

Statement of General Conformance

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LICENSE NUMBER

05/31/23
EXPIRATION DATE

LIST COMPLETELY, ITEMS REVIEWED AND ACCEPTED:

PC SHADE STRUCTURE

Mark Twain ES - 02-120006

Statement of General Conformance

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