

January 13, 2021

ADDENDUM NO. 1

TO THE CONTRACT DOCUMENTS

FOR

CAJON HIGH SCHOOL - WOOD SHOP DUST COLLECTOR

FOR THE SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT 777 North F Street San Bernardino, CA 92410

DSA No. 04-118085 File No. 36-H7 RCA Job No. 1-78-24

NOTICE TO BIDDERS

This Addendum forms a part of the Contract and modifies the original documents DSA Approved on December 10, 2019. It is intended that all work affected by the following modifications shall conform with related provisions and general conditions of the contract of the original drawings and specifications. Modify the following items wherever appearing in any drawing or sections of the specifications. Acknowledge receipt of Addendum No. 1 in the space provided on the Bid Form. Failure to do so may subject bidder to disqualification.

GENERAL

Item No. 1.1	General Items:
1.1.1	For bidder reference, the Project Estimate is \$300,000.

CHANGES TO THE SPECIFICATIONS

Item No. 1.2	Reference New Section 08 06 71 – Door Hardware:
1.2.1	Add attached new Section 08 06 71 in its entirety
Item No. 1.3	Reference New Section 31 22 00 – Grading:
1.3.1	Add attached new Section 31 22 00 in its entirety
Item No. 1.4	Reference New Section 31 23 23 – Fill:
1.4.1	Add attached new Section 31 23 23 in its entirety
Item No. 1.5	Reference New Section 32 11 23 – Aggregate Base Courses:
1.5.1	Add attached new Section 32 11 23 in its entirety
Item No. 1.6	Reference New Section 32 12 16 – Asphalt Paving:
1.6.1	Add attached new Section 32 12 16 in its entirety

Item No. 1.7	Reference New Section 32 13 13 – Concrete Paving:
1.7.1	Add attached new Section 32 13 13 in its entirety
Item No. 1.8	Reference New Section 32 17 23.13 – Painted Pavement Markings:

1.8.1 Add attached new Section 32 17 23.13 in its entirety

CHANGES TO THE DRAWINGS

Item No. 1.9	Reference Sheet T1:
1.9.1	Typical Abbreviations, add the following to abbreviation list: FF - Factory Finish
Item No. 1.10	Reference Sheet AS-0.1:
1.10.1	Detail 5, revise per clouded areas of attached Sketch ASK-1.1
Item No. 1.11	Reference Sheet AS-1.0:
1.11.1	Add New Details 9 & 10, per attached Sketch ASK-1.2
1.11.2	Add New Details 15 & 26, per attached Sketch ASK-1.3
1.11.3	Add New Detail 27, per attached Sketch ASK-1.5
Item No. 1.12	Reference Sheet AS-1.1:
1.12.1	Detail 25, revise per clouded areas of attached Sketch ASK-1.4
1.12.2	Detail 6, revise Keynote #1 to read " Sandblast (E) striping"
Item No. 1.13	Reference Sheet A-1.0:
1.13.1	Revise per clouded areas of attached revised Sheet A-1.0.
Item No. 1.14	Reference Sheet A-2.0:
1.14.1	Revise per clouded areas of attached revised Sheet A-2.0
Item No. 1.15	Reference Sheet AD-1.1:
1.15.1	Detail 15, revise per clouded areas of attached revised Sheet AD-1.1
Item No. 1.16 1.16.1	Reference Sheet S-0.1: Revise per clouded areas of attached revised Sheet S-0.1. Added "Cold-Formed Steel Framing" notes. Added "Post-Installed Anchors" notes. Added "Anchors And/Or Dowels Installed With Adhesive" notes.
Item No. 1.17	Reference Sheet S-0.2:
1.17.1	Add New Detail 11, for opening thru existing roof deck for duct, per attached Sketch SSK-1.1
Item No. 1.18	Reference Sheet M-1.0:
1.18.1	Revise per clouded areas of attached revised Sheet M-1.0.
Item No. 1.19 1.19.1	Reference Sheet E0.3: Added circuit to Panel 5SS for automatic door hardware in wood shop. See clouded areas of attached revised Sheet E0.3.
Item No. 1.20 1.20.1	Reference Sheet E2.1: Added 120V circuit and low voltage box/pathways for connections of automatic door hardware in wood shop. Removed 120V circuits from Corridor F2.1 doors. See clouded areas of attached revised Sheet F2 1

ATTACHMENTS

 General
 N/A

 Specifications
 08 06 71, 31 22 00, 31 23 23, 32 11 23, 32 12 16, 32 13 13, 32 17 23.13

 Sketches
 ASK-1.1, ASK-1.2, ASK-1.3, ASK-1.4, ASK-1.5, SSK-1.1

 Sheets
 A-1.0, A-2.0, AD-1.1, S-0.1, M-1.0, E0.3, E2.1

END OF ADDENDUM NO. 1

Roger Clarke, Principal #C-21340

SECTION 08 06 71 DOOR HARDWARE SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule of door hardware sets for swinging, sliding, and other door types as indicated on drawings.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware: Requirements to comply with in coordination with this section.

1.03 REFERENCE STANDARDS

- A. BHMA (CPD) Certified Products Directory; 2016.
- B. BHMA A156.3 American National Standard for Exit Devices; 2014.
- C. BHMA A156.5 American National Standard for Cylinders and Input Devices for Locks; 2014.
- D. BHMA A156.13 American National Standard for Mortise Locks & Latches Series 1000; 2012.
- E. BHMA A156.18 American National Standard for Materials and Finishes; 2012.
- F. DHI (H&S) Sequence and Format for the Hardware Schedule; 1996.

1.04 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Comply with submittal requirements as indicated in Section 08 71 00.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Only manufacturers listed in Door Hardware Schedule or Section 08 71 00 are considered acceptable, unless noted otherwise.
- B. Obtain each type of door hardware as indicated from a single manufacturer and single supplier.
- C. Products are listed and certified compliant with specified standards by BHMA (CPD).
- D. Manufacturer's Abbreviations: Coordinate with manufacturers listed in Section 08 71 00.
 - 1. GLY Glynn Johnson, Allegion, PLC.
 - 2. IVE Ives, Allegion, PLC.
 - 3. LCN LCN Commercial Division, Allegion, PLC.
 - 4. SCE Schlage Electronic Security, Allegion, PLC
 - 5. SCH/SC Schlage Lock Company, Allegion, PLC.
 - 6. VON Von Duprin, Allegion, PLC..
 - 7. ZER Zero Industries, Inc., Allegion, PLC.

- 8. TBD To be determined.
- 9. BYO/OT By Others.

2.02 DESCRIPTION

- A. Door hardware sets provided represent the design intent, they are only a guideline and should not be considered a detailed or complete hardware schedule.
 - 1. Provide door hardware item(s) as required for similar purposes, even when item is not listed for a door in Door Hardware Schedule.
 - 2. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and functionality.
 - 3. Door hardware supplier is responsible for providing proper size and hand of door for products required in accordance with Door Hardware Schedule and as indicated on drawings.
 - 4. Quantities listed are for each Pair (PR) of doors, or for each Single (SGL) door, as indicated in hardware sets.

2.03 LOCK FUNCTION CODES

- A. Function Codes for Cylindrical Locks: Complying with BHMA A156.5.
- B. Function Codes for Mortise Locks: Complying with BHMA A156.13.
- C. Function Codes for Exit Devices: Complying with BHMA A156.3.

2.04 FINISHES

A. Finishes: Complying with BHMA A156.18.

PART 3 EXECUTION

3.01 DOOR HARDWARE SCHEDULE

- A. Organize listing of door hardware components within each hardware set in compliance with 10-Part scheduling sequence indicated in DHI (H&S), unless otherwise indicated.
- B. See door schedule in drawings for hardware set assignments.
- C. No hardware shall be ordered until Finished Hardware has been reviewed and approved by Architect's hardware consultant.
- D. Provide Factory order numbers for all products supplied on this project as part of close out documents for District's warranty records.
- E. Any door count quantity shown in the HW set listings is for reference only. Contractor shall verify all door quantities with the Architectural Drawings.
- F See door schedule in drawings for hardware set assignments.
- G. Hardware Sets: See next page.

LEGEND

GYL	GLYNN JOHNSON
IVE	IVES
KEE	KEEDEX
LCN	LCN
SAR	SARGENT
VON	VON DUPRIN
ZER	ZERO

HW 01: Door #201, #501 – New Door & Frame

<u>QTY</u>		DESCRIPTION	CATALOG NUMBER	<u>FINISH</u>	<u>MFR</u>
3	EA	HINGE	3CB1 4.5 x 4.5	652	IVE
1	EA	CLASSROOM SEC LOCK	L9071L 06A	626	SCH
2	EA	MORTISE CYLINDER	MATCH EXISTING KEY SYSTEM	626	SAR
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	PROTECTION PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS436/438 AS REQ'D	626	IVE
3	EA	SILENCER	SR64/65 AS REQ'D	GRY	IVE

HW 02: Door #211 – Pair of Doors - Existing Door & Frame

<u>QTY</u>		DESCRIPTION	CATALOG NUMBER	<u>FINISH</u>	<u>MFR</u>
2	EA	CONT. HINGE	045XY	628	IVE
1	EA	RATED REMOVABLE MULLION	KR4954	689	VON
2	EA	EXIT HARDWARE	CDSI-PA-AX-98-NL-OP-110MD	626	VON
2	EA	DOOR PULL	VR910NL	630	IVE
1	EA	MULLION STORAGE KIT	MT54	689	VON
1	EA	MORTISE CYLINDER (MULLION)	MATCH EXISTING KEY SYSTEM	626	SAR
2	EA	IC RIM CYLINDER	MATCH EXISTING KEY SYSTEM	626	SAR
2	EA	MORTISE CYLINDER (CD)	MATCH EXISTING KEY SYSTEM	626	SAR
2	EA	SURFACE CLOSER	4040XP	689	LCN
2	EA	PROTECTION PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FLOOR STOP	FS18S	BLK	IVE
1	EA	PERIMETER SEALS	328AA HEAD AND JAMBS	AA	ZER
1	EA	THRESHOLD	AS REQUIRED	AL	ZER

Note:

1. Existing condition, GC and/ or installer to confirm hardware compatibility, including sill condition.

HW 02A: Door #203 - Existing Door & Frame

<u>QTY</u>		DESCRIPTION	CATALOG NUMBER	<u>FINISH</u>	<u>MFR</u>
1	EA	CONT. HINGE	045XY	628	IVE
1	EA	EXIT HARDWARE	CDSI-PA-AX-98-NL-OP-110MD	626	VON
1	EA	DOOR PULL	VR910NL	630	IVE
1	EA	IC RIM CYLINDER	MATCH EXISTING KEY SYSTEM	626	SAR
1	EA	MORTISE CYLINDER (CD)	MATCH EXISTING KEY SYSTEM	626	SAR
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	PROTECTION PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS18S	BLK	IVE
1	EA	PERIMETER SEALS	328AA HEAD AND JAMBS	AA	ZER
1	EA	THRESHOLD	AS REQUIRED	AL	ZER

Note:

1. Existing condition, GC and/ or installer to confirm hardware compatibility, including sill condition.

HW 03	HW 03: Door #601 – Existing Door & Frame						
<u>QTY</u>		DESCRIPTION	CATALOG NUMBER	<u>FINISH</u>	<u>MFR</u>		
1	EA	CONT. HINGE	045XY	628	IVE		
1	EA	DOOR LOOP	K-DLA12"	Alum	KEE		
1	EA	ELEC PANIC HARDWARE	RX-QEL-PA-AX-98-NL-OP-110MD	626	VON		
1	EA	IC RIM CYLINDER	MATCH EXISTING KEY SYSTEM	626	SAR		
1	EA	DOOR PULL	VR910NL	630	IVE		
1	EA	OH STOP	90S	630	GLY		
1	EA	SURF AUTO OPERATOR	9542	689	LCN		
1	EA	ACTUATOR (INSIDE ONLY)	8310-836TW	630	LCN		
1	EA	SENSOR PACKAGE	8310-3881		LCN		
1	EA	ACTIVATION RECEIVER	8310-865	BLU	LCN		
1	EA	PROTECTION PLATE	8400 10" X 2" LDW B-CS	630	IVE		
1	EA	PERIMETER SEALS	328AA HEAD AND JAMBS	AA	ZER		
1	EA	THRESHOLD	AS REQUIRED	Alum	ZER		
1	EA	POWER SUPPLY	PS902 9002RS 120/240VAC		VON		

Notes:

1. Install door loop at the top corner, hinge side of the door to avoid damage.

2. Existing condition, GC and/ or installer to confirm hardware compatibility, including sill condition.

HW 04: #602 – Existing Door & Frame/ Emergency Exit Only

<u>QTY</u>		DESCRIPTION	CATALOG NUMBER	<u>FINISH</u>	<u>MFR</u>
1	EA	CONT. HINGE	045XY	628	IVE
1	EA	DOOR LOOP	K-DLA12"	Alum	KEE
1	EA	ELEC PANIC HARDWARE	RX-QEL-PA-AX-98-NL-OP-110MD	626	VON
1	EA	IC RIM CYLINDER	MATCH EXISTING KEY SYSTEM	626	SAR
1	EA	OH STOP	90S	630	GLY
1	EA	SURF AUTO OPERATOR	9542	689	LCN
1	EA	ACTUATOR (INSIDE)	8310-836TW	630	LCN
1	EA	SENSOR PACKAGE	8310-3881		LCN
1	EA	ACTIVATION RECEIVER	8310-865	BLU	LCN
1	EA	PROTECTION PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	PERIMETER SEALS	328AA HEAD AND JAMBS	AA	ZER
1	EA	THRESHOLD	AS REQUIRED	Alum	ZER
1	EA	POWER SUPPLY	PS902 9002RS 120/240VAC		VON

Notes:

- 1. Install door loop at the top corner, hinge side of the door to avoid damage.
- 2. Existing condition, GC and/ or installer to confirm hardware compatibility, including sill condition.

<u>QTY</u>		DESCRIPTION	CATALOG NUMBER	<u>FINISH</u>	<u>MFR</u>
1	EA	CONT. HINGE	045XY	628	IVE
1	EA	DOOR LOOP	K-DLA12"	Alum	KEE
1	EA	ELEC PANIC HARDWARE	RX-QEL-PA-AX-98-NL-OP-110MD	626	VON
1	EA	IC RIM CYLINDER	MATCH EXISTING KEY SYSTEM	626	SAR
1	EA	OH STOP	90S	630	GLY
1	EA	SURF AUTO OPERATOR	9542	689	LCN
1	EA	ACTUATOR (INSIDE)	8310-836TW	630	LCN
1	EA	SENSOR PACKAGE	8310-3881		LCN
1	EA	ACTIVATION RECEIVER	8310-865	BLU	LCN
1	EA	PROTECTION PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	PERIMETER SEALS	328AA HEAD AND JAMBS	AA	ZER
1	EA	THRESHOLD	AS REQUIRED	Alum	ZER
1	EA	POWER SUPPLY	PS902 9002RS 120/240VAC		VON

HW 04: #101, #102 – Existing Door & Frame

Notes:

- 1. Install door loop at the top corner, hinge side of the door to avoid damage.
- 2. Existing condition, GC and/ or installer to confirm hardware compatibility, including sill condition.

HW G1: G1 New Gate

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING

<u>QTY</u>		DESCRIPTION	CATALOG NUMBER	<u>FINISH</u>	<u>MFR</u>
1	EA	PANIC HARDWARE	PA-99-EO-WH	626	VON
1	EA	PANIC HARDWARE	PA-99-NL-OP-11OMD-WH	626	VON
1	EA	RIM CYLINDER	CAMPUS STANDARD	626	TBD
1	EA	DOOR PULL	VR910 DL	630	IVE
1	EA	DOOR PULL	VR910 NL	630	IVE
2	EA	GATE CLOSURE/HINGE	MAMOTH180-RAL9005	BLK	LOX
2	EA	FLOOR STOP	FS18L	BLK	IVE

GATE FABRICATOR TO PROVIDE PROPER REINFORCEMENT FOR GATE CLOSER/HINGE AND RIM PANIC DEVICE.

GATE FABRICATOR TO PROVIDE GATE LOCK BOX PER SPECIFIED HARDWARE.

FIXED MULLION (GATE CENTER POST) TO BE PROVIDED BY GATE FRABRICATOR - SEE GATE ELEVATION GATE CLOSER/HINGE - MAMMOTH180

END OF SECTION

SECTION 31 22 00 GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

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

1.03 SUBMITTALS

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

1.04 QUALITY ASSURANCE

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

1.05 PROTECTION

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

PART 2 PRODUCTS

2.01 MATERIALS

- A. Topsoil: See Section 31 23 23.
- B. Subsoil: Excavated material, graded free of lumps larger than 3-inches, rocks larger than 6 inches, and debris; or in accordance with trench backfill requirements.
- C. Other Fill Materials: See Section 31 23 23.
- D. Shoring and Bracing: Provide all materials and services necessary to properly engineer and construct shoring for excavations. Selection of materials and design of shoring, underpinning and bracing of new and existing structures shall be solely the responsibility of the Contractor.
 - 1. Shoring design shall comply with State of California Trenching and Shoring Manual issued by Offices of Structure Construction; 2011.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that survey bench mark and intended elevations for the Work are as indicated.
- B. Verify the absence of standing or ponding water.
- C. The Drawings do not purport to show all below-grade conditions and objects on the site. Refer to Section 00 31 00 - Available Project Information.
- D. Upon discovery of unknown utility or concealed conditions, discontinue affected Work and notify Construction Manager, Architect and District for direction. Unforeseen conditions shall be resolved in accordance with the General Conditions.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect from damage above- and below-grade utilities to remain.
 - 1. Maintain and protect existing utilities remaining which pass through Project area.
- D. Notify utility company to remove and relocate utilities, as required.
- E. Provide temporary means and methods to remove all standing or ponding water from areas prior to grading.
- F. Protect site features to remain, including but not limited to bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs, from damage by grading equipment and vehicular traffic.
- G. Protect trees to remain by providing substantial fencing around entire tree at the outer tips of its branches; no grading is to be performed inside this line.
- H. Protect plants, lawns, and other features to remain as a portion of final landscaping.

3.03 ROUGH GRADING

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

- 1. Upaved area slope for a distance of 10 feet from the building: Not less than one unit vertical in 20 units horizontal or 5 percent.
 - a. CBC Section 1804A.4.
- 2. When supported by soil conditions and climate; slope not less than 1:48 or 2 percent in unpaved areas.
 - a. CBC Section 1804A.4, Exception.
- O. Make grade changes gradual. Blend slopes into level areas.

3.04 SOIL REMOVAL AND STOCKPILING

- A. Stockpile topsoil to be re-used on site; remove remainder from site.
 - 1. Topsoil and vegetation layers, root zones, and similar surface materials should be stripped and stockpiled for either reuse in landscape surface areas or removed from the site.
- B. Stockpile subsoil on site for backfill, if soil is appropriate.
 - 1. Stockpile subsoil to depth not exceeding 8 feet.
- C. Remove all lumped subsoil, boulders and rock in excess of 6 inches in greatest dimension.
- D. Stockpile subsoil to be re-used on site; remove remainder from site.
- E. Stockpiles: Use areas designated on site; pile depth not to exceed 8 feet; cover to protect from erosion.

3.05 FINISH GRADING

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

3.06 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus 0.10 foot (1-3/16 inches) from required elevation.
- B. Top Surface of Finish Grade: Plus or minus 0.04 foot (1/2 inch).
- C. Top Surface Under Paving: Plus or minus 0.04 foot (1/2 inch) from required elevation.
- D. Top Surface Under Footings and Foundations: Plus 0, minus 0.2 foot (2.4 inch).
- E. Top Surface Under Slabs on Grade: Plus 0, minus 0.04 foot (1/2 inch).

3.07 REPAIR AND RESTORATION

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

3.08 FIELD QUALITY CONTROL

- A. See Section 31 23 23 for compaction density testing.
- B. Field Quality Control:
 - 1. Field inspections and testing shall be performed in accordance with requirements specified in Section 01 40 00 and 01 45 33.
 - 2. Make required quality control submittals in accordance with requirements specified.
- C. Non-compliance: Should grade elevations, tests of fill or backfill indicate non-compliance with required elevations or density, Contractor shall over-excavate, recompact and retest until specified grade or density is obtained.
 - 1. Costs and Time associated with remedial Work and retesting shall be in accordance with provisions of the General Conditions.
 - 2. Retesting to demonstrate compliance shall be by a testing laboratory acceptable to District and shall be at Contractor's expense.

3.09 CLEANING

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

3.10 PROTECTION

- A. Protect completed grading from erosion from weather and traffic.
- B. Over-excavate and recompact areas damaged by construction activities and weather.

END OF SECTION

SECTION 31 23 23

FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Filling, backfilling, and compacting for footings, slabs-on-grade, paving, site structures, and utilities within the building.
- B. Backfilling and compacting for utilities outside the building to utility main connections.
- C. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 Cast-in-Place Concrete.
- B. Section 31 22 00 Grading: Removal and handling of soil to be re-used.
- C. Section 31 22 00 Grading: Site grading.
- D. Section 31 23 16 Excavation: Removal and handling of soil to be re-used.
- E. Section 33 41 00 Subdrainage: Filter aggregate and filter fabric for foundation drainage systems.

1.03 DEFINITIONS

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

1.04 REFERENCE STANDARDS

- A. AASHTO T 180 Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18 in.) Drop; 2017.
- B. 11
- C. 11
- D. ASTM D1556/D1556M Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2015.
- E. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2012.
- F. ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2011.
- G. DTSC-Clean Fill Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method; 2011.
- H. 11
- I. CT 202- Section 26-1.02B: Caltrans.
- J. Geotechnical Report.

1.05 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Samples: 10 pounds sample of each type of fill; submit in air-tight containers to testing laboratory.
 - 1. Submit samples directly to Geotechnical Engineer for testing and analysis copy transmittals to Architect and District.
- C. Materials Sources: Submit name of imported materials source.
- D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used, including manufactured fill.
- E. Compaction Density Test Reports.
- F. Provide proof that all imported materials conform to the requirements of DTSC-Clean Fill Imported Fill Materials for School Sites by proper documentation for the imported materials.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.
- B. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

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

1.08 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 FILL MATERIALS

- A. All fill materials will be in conformance with the Soils Report, addenda and geotechnical data indicated in Section 00 31 00 Available Project Information.
- B. General Fill: Subsoil excavated on-site.
 - 1. Graded.
 - 2. Free of lumps larger than 3 inches, rocks larger than 4 inches, and debris.
 - 3. Conforming to ASTM D2487 Group Symbol SP, SW, SM, or GM.
- C. Structural Fill: Imported borrow.

- 1. Graded.
- 2. Free of organic matter, debris, and oversize particles (e.g., cobbles, rubble, etc. that are larger than 3 inches, rocks larger than 4 inches. Fill shall contain at least fifty percent of material smaller than 1/4 inch in size.
- 3. Imported fill materials: The soil shall be tested for potential contamination in accordance with DTSC-Clean Fill protocols. Submit to Geotechnical Engineer.
 - a. Import sandy soil shall be free of organics, debris and oversize particles (e.g., cobbles, rubble, etc. that are greater than 3 inches in the largest dimension).
 - b. Additionally, import soils shall not have any corrosion impacts to buried concrete; and be non-expansive (Expansion Index less than 50 per 1).
 - c. Prior to import, geotechnical consultant shall evaluate and test the import soils in order to confirm the quality of the material.
- 4. On-site soils should only be used as specified in the Soils Report.
- 5. Conforming to ASTM D2487 Group Symbol SP, SW, SM, or GM.
- D. Concrete for Fill: As specified in Section 03 30 00; compressive strength of 2500 psi.
 - 1. Exception: Concrete used under footings and foundations to correct over-excavation shall be same as for footings and foundation.
- E. Granular Fill Fill Type GM, GW: Coarse aggregate, conforming to Uniform Standard Specifications for Public Works Construction Off-Site Improvements standard.
- F. Granular Fill Pea Gravel: Natural stone; washed, free of clay, shale, organic matter.
 - 1. Grade in accordance with ASTM D2487 Group Symbol GM.
- G. Sand: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter.
 - 1. Grade in accordance with ASTM D2487 Group Symbol SP or SW.
- H. Topsoil: Topsoil excavated on-site.
 - 1. Unclassified.
 - a. The soil shall be tested for potential contamination in accordance with DTSC protocols.
 - 2. Graded.
 - 3. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.
 - 4. Acidity range (pH) of 5.5 to 7.5.
 - 5. Containing a minimum of 4 percent and a maximum of 25 percent inorganic matter.
 - 6. Conforming to ASTM D2487 Group Symbol OH.
 - 7. Limit decaying matter to 5 percent of total content by volume.
- I. Type F Subsoil: Reused, free of rocks larger than 3 inch size, and debris.
 - 1. Existing fill and alluvium or older alluvium may be considered suitable for re-use as compacted fills provided the recommendations of the geotechnical report and observations of the geotechnical engineer are followed.
 - 2. Expansive soils (EI>51) are not be placed with the upper 3 feet of subgrade soils

2.02 ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, non-woven; Geotex 801 manufactured by Propex Geotextile Systems, geotextile.com.

2.03 SOURCE QUALITY CONTROL

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

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify structural or other backfill materials to be reused or imported are acceptable to the satisfaction of the Geotechnical Engineer. Approval shall be obtained in advance of re-use or importation onto the site.
 - 1. The soil shall be tested for potential contamination in accordance with DTSC-Clean Fill protocols.
 - 2. Provide imported fill materials compatible with on-site soils in addition to being suitable for its intended use with the following criterion, as allowed by the Geotechnical Engineer.
 - a. Predominantly granular in nature.
 - b. Containing no rocks larger than 6 inch maximum dimension.
 - c. Free of organic material (loss on ignition less-than 2 percent).
 - d. Very low expansion potential (with an Expansion Index less than 21).
 - e. Low corrosion impact to the proposed improvements.
- B. Verify that survey bench marks and intended elevations for the Work are as indicated.
- C. Identify required lines, levels, contours, and datum locations.
- D. See Section 31 22 00 for additional requirements.
- E. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.
- F. Verify structural ability of unsupported walls to support imposed loads by the fill.
- G. Verify areas to be filled are not compromised with surface or ground water.

3.02 PREPARATION

- A. Scarify and proof roll subgrade surface to a depth of 8 inches to identify soft spots.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with 1, Type II or concrete fill and compact to density equal to or greater than requirements for subsequent backfill material.

- C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- D. Prior to placement of aggregate base course material at paved areas, compact subsoil to 95 percent of its maximum dry density in accordance with ASTM D1557.
- E. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

- A. Fill to contours and elevations indicated using unfrozen materials.
- B. Fill up to subgrade elevations unless otherwise indicated.
 - 1. Place fill soils compacted in horizontal lifts to a relative compaction of 90 percent or more in general accordance with ASTM D1557.
 - 2. Lift thickness for fill soils will vary depending on the type of compaction equipment used but should generally be placed in horizontal lifts not exceeding 8 inches in loose thickness.
 - 3. Place fill soils at slightly above optimum moisture content as evaluated by ASTM D1557.
 - 4. Avoid damage to wet and dry utility lines when compacting fill and subgrade materials.
- C. Employ a placement method that does not disturb or damage other work.
 - 1. Do not disturb or damage foundation perimeter drainage and foundation waterproofing and protective cover utilities in trenches.
- D. Systematically fill and compact per geotechnical report. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- E. Maintain optimum moisture content of fill materials to attain required compaction density.
- F. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.
- G. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.
 - 1. Expansive soils (EI>20) are not be placed with the upper 3 feet of subgrade soils. CBC Section 1803.5.3.
- H. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
- I. Correct areas that are over-excavated.
 - 1. Load-bearing foundation surfaces: Fill with concrete.
 - 2. Other areas: Use general fill, flush to required elevation, compacted to minimum 90 or 95 percent of maximum dry density in subgrade zone.
- J. Compaction Density Unless Otherwise Specified or Indicated:
 - 1. Under paving, slabs-on-grade, and similar construction: 90 percent of maximum dry density.
 - 2. At other locations: 90 percent of maximum dry density.
- K. Reshape and re-compact fills subjected to vehicular traffic.

- L. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Architect. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.
- M. Remove surplus fill and backfill materials from site.

3.04 FILL AT SPECIFIC LOCATIONS

- A. Use general fill unless otherwise specified or indicated.
- B. Structural Fill:
 - 1. Use general fill.
 - 2. Fill up to subgrade elevations.
 - 3. Maximum depth per lift: 6 inches, compacted.
 - 4. Compact to minimum 90 percent of maximum dry density.
- C. Under Interior Slabs-On-Grade: Comply with CALGreen Section 4.505.2.1 Capillary Break and1.
 - 1. Use granular fill. Type Class 2 Aggregate base or No. 8 or No. 89, 1/2 inch or larger.
 - 2. Depth: 4 inches deep.
 - 3. Compact to 90 percent of maximum dry density.
- D. At Footings:
 - 1. Use general fill.
 - 2. Fill up to subgrade elevation.
 - 3. Compact each lift to 90 percent of maximum dry density.
 - 4. Do not backfill against unsupported foundation walls.
 - 5. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.
- E. Over Subdrainage Piping at Foundation Perimeter and Under Slabs:
 - 1. Drainage fill and geotextile fabric: Section 33 41 00.
 - 2. Cover drainage fill with general fill.
 - 3. Fill up to subgrade elevation.
 - 4. Compact to 90 percent of maximum dry density.
- F. Over Buried Utility Piping, Conduits, and Duct Bank in Trenches:
 - 1. Bedding: Use general fill.
 - 2. Cover with general fill.
 - 3. Fill up to subgrade elevation.
 - 4. Compact in maximum 8 inch lifts to 90 percent of maximum dry density. Compact to 95 percent in subgrade zone.
- G. At Planting Areas Other Than Lawns :
 - 1. Use general fill.

- 2. Fill up to finish grade elevations.
- 3. Compact to 90 percent of maximum dry density.
- 4. See Section 31 22 00 for topsoil placement.
- H. Under Monolithic Paving :
 - 1. Compact subsoil to 90 percent of its maximum dry density before placing fill.
 - 2. Use general fill.
 - 3. Fill up to subgrade elevation.
 - 4. Compact to 90 percent of maximum dry density.
 - 5. See Section 32 11 23 for aggregate base course placed over fill.

3.05 TOLERANCES

- A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.
- B. Top Surface of Filling Under Paved Areas: Plus or minus 1/2 inch from required elevations.

3.06 FIELD QUALITY CONTROL

- A. See Section 01 40 00 Quality Requirements, for general requirements for field inspection and testing.
 - 1. Laboratory Tests and Analyses: Where backfill is required to be compacted to a specified density, tests for compliance shall be made in accordance with requirements specified in Section 01 40 00 Quality Requirements.
- B. Perform compaction density testing on compacted fill in accordance with ASTM D1556 or ASTM D6938.
 - 1. Field inspections and testing shall be performed and submitted in accordance with requirements specified in Section 01 40 00 Quality Requirements.
 - 2. Allow testing service to inspect and approve each subgrade and fill layer before further fill, backfill or construction Work is performed.
 - 3. Alternate Density Test Method:
 - a. Field density tests may also be performed by the nuclear method in accordance with ASTM D6938, providing that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D1556/D1556M.
 - b. In conjunction with each density calibration check, check the calibration curves furnished with the moisture gages in accordance with ASTM D6938.
 - c. If field tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of Work, on each different type of material encountered, and at intervals as directed by Architect or District's testing and inspection agency.
- C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 1557 ("modified Proctor") or AASHTO T 180.
- D. Non-compliance: If tests indicate work does not meet specified requirements, remove work, replace and retest.

- 1. Should tests of fill or backfill indicate non-compliance with required density, Contractor shall over-excavate, recompact and retest until specified density is obtained.
- 2. Costs and Time associated with remedial Work and retesting shall be in accordance with provisions of the General Conditions.
- 3. Retesting to demonstrate compliance shall be by a testing laboratory acceptable to District and shall be at Contractor's expense.
- E. Frequency of Tests:
 - 1. Footing Subgrade Testing:
 - a. For each strata of soil on which footings will be placed, perform at least one test to verify required design bearing capacities.
 - b. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata when acceptable to Geotechnical Engineer.
 - 2. Paved Areas and Building Slab Subgrade Testing:
 - a. Perform at least one field density test of subgrade for every 2,000 sf of paved area or building slab, but in no case fewer than three tests.
 - b. In each compacted fill layer, perform one field density test for every 2,000 sf of overlaying building slab or paved area, but in no case fewer than three tests.
 - 3. Foundation Wall Backfill Testing: Perform at least two field density tests at locations and elevations as directed.
- F. Proof roll compacted fill at surfaces that will be under slabs-on-grade.

3.07 CLEANING

- A. See Section 01 74 19 Construction Waste Management and Disposal, for additional requirements.
- B. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- C. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION

SECTION 32 11 23

AGGREGATE BASE COURSES

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 Grading: Preparation of site for base course.
- B. Section 32 12 16 Asphalt Paving: Finish and binder asphalt courses.
- C. Section 32 13 13 Concrete Paving: Finish concrete surface course.

1.03 REFERENCE STANDARDS

- A. AASHTO T 180 Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18 in.) Drop; 2017.
- B. ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2012.
- C. ASTM D1556/D1556M Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2015.
- D. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2012.
- E. ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2011.
- F. ASTM D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2015.
- G. 11

1.04 SUBMITTALS

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

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements: Where reference is made to Standard Specifications, the following shall apply.
 - 1. Perform off-site Work in public rights-of-way in accordance with requirements of authorities having jurisdiction, including ASTM D3763. For conditions not indicated otherwise on Contract Drawings, conform to Standard Details adopted by authorities having jurisdiction.
 - 2. Perform on-site Work as indicated and referenced on Contract Drawings and as specified herein.
- B. The quantity of volatile organic compounds (VOC) used in weed killer, tack coat, primer and other materials shall not exceed limits permitted under current regulations of:
 - 1. South Coast Air Quality Management District (AQMD).
- C. Source Quality Control: Obtain materials from one source throughout.

1.06 DELIVERY, STORAGE, AND HANDLING

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

PART 2 PRODUCTS

2.01 MATERIALS

- A. Sub-Base Material: Existing or imported materials as recommended in geotechnical report. Refer to Document 00 31 00 - Availabe Project Information.
- B. Aggregate Type Class II: Coarse or crushed aggregate, conforming to Municipality, ASTM D3763 Section 200-2.2.
- C. Coarse Aggregate: Pit run washed stone; free of shale, clay, friable material and debris.
 - 1. Graded in accordance with ASTM D2487 Group Symbol GW.
- D. Herbicide: Comply with all applicable environmental protection and hazardous materials laws and regulations .
 - 1. Comply with current EPA acceptable standard and the California Department of Pesticide Regulations for soils sterilant.
 - 2. Obtain product approval from District, prior to purchase and use.
 - 3. Sterilant: Selected as appropriate for the environment in which is it to be placed.
 - 4. Contractor shall be licensed with the State of California to apply sterilant.
 - 5. Sterilant: Commercial grade for commercial application.

- 6. Payment for soil sterilization: Include full compensation for application and all materials and incidental work required.
- 7. Application Rate: 7 lbs. per acre. If another manufacturer is used follow their recommendations.
- 8. Basis of Design Product: Spike 80DF as manufactured by Dow AgroSciences; www.dowagro.com, or approved equal.

2.02 SOURCE QUALITY CONTROL

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

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

- A. Stockpiling:
 - 1. Clear and level storage sites prior to stockpiling of material.

- 2. Stockpile all materials, including approved material available from excavation and grading, in the manner and at the locations designated.
- 3. Aggregates shall be stockpiled on the cleared and leveled areas designated by the Construction Manager to prevent segregation.
- 4. Materials obtained from different sources shall be stockpiled separately.
- B. Soil Sterilant:
 - 1. Sterilize soil areas to receive paving.
 - 2. Apply soil sterilant in accordance with manufacturer's instructions and applicable environmental regulations.
 - 3. Take care to confine application to the areas to be paved. Sterilant shall not be applied within 2 feet of planting areas.
- C. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- D. Do not place aggregate on soft, muddy, or frozen surfaces.

3.03 INSTALLATION

- A. Place and compact aggregate base material in accordance with ASTM D3763, Subsection 301-2. Place aggregate base below curbs and gutters and paving also, compacted to 95 percent at vehicular traffic and 90 percent at pedestrian-only traffic.
- B. Application of Base Course:
 - 1. After preparing the subgrade, Avoid all vehicular or machine traffic on the subgrade.
 - a. Should it be necessary to haul over the prepared subgrade, drag and roll the traveled way as frequently as may be necessary to remove ruts, cuts, and breaks in the surface.
 - b. Rake and hand tamp all cuts, ruts, and breaks in the surface of the subgrade that are not removed by the above operations.
 - c. Equip with pneumatic tires all equipment used for transporting materials over the prepared subgrade.
 - 2. Do not permit continued use of sections of prepared subgrade for hauling, so as to cut up or deform it from the true cross-section. Protect the prepared subgrade from all traffic.
 - 3. Maintain the surface in its finished condition until the succeeding layer is placed.
- C. Under Bituminous Concrete Paving:
 - 1. It is required that areas of exterior asphalt pavement be underlain by a layer of aggregate base material which meets the requirements, Thickness of base layer is as shown on the Drawings and varies per the Usage Type area.
 - a. It is required that the upper 12 inches of soils below asphalt pavement base material be over-excavated and consist predominantly of satisfactory soil materials and/or approved imported fill.
 - 1) Engineered Fill: See Section 31 23 23 Fill.
 - b. It is required that the exposed bottom surface soils, below overexcavation, be scarified to the recommended depth of 8 inches, moisture conditioned to achieve

optimum moisture content, but not higher than 2 percent above optimum, and then re-compacted to a minimum 90 percent relative compaction before any fill materials are placed.

- 2. The above subgrade preparation recommendations are based on the assumption that soils encountered during field exploration are representative of soils throughout the site.
 - a. However, there can be unforeseen and unanticipated variations in soils between points of subsurface exploration. For this reason, the actual subgrade preparation will have to be determined on the basis of in-grading observations and testing performed by representatives of the project geotechnical consultant.
- 3. Provide grade stakes and elevations by a California Licensed Surveyor (LS) for the Geotechnical Engineer.
 - a. Verify that the over-excavation depths, shown on the construction drawings for asphalt concrete pavement structural sections, have been achieved prior to re-compaction.
- 4. Correct irregularities by dressing down or filling as may be required, to bring areas to true subgrade elevations.
- 5. Where filling is required, scarify the subgrade to bond the new material to the in place material; use additional material as required at no additional cost. Subject to the approval of the Architect.
- 6. Remove excess material from the site to a legal disposal area.
- D. Under Portland Cement Concrete Paving:
 - 1. Compact to 95 percent of maximum dry density and 90 percent at pedestrian-only traffic.
- E. Place aggregate in maximum 4 inch layers and roller compact to specified density.
- F. Level and contour surfaces to elevations and gradients indicated.
- G. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.
- H. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- I. Use mechanical tamping equipment in areas inaccessible to compaction equipment.
- J. Apply herbicide to finished surface.

3.04 TOLERANCES

- A. Subgrade Tolerances:
 - 1. Subgrade for Pavement: Do not vary more than 0.02 ft..
 - 2. Subgrade for Subbase or Base Material: Do not vary more than 0.04 ft..
 - 3. Variations within the above specified tolerances shall be compensating so that the average grade and cross section specified are met.
- B. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- C. Scheduled Compacted Thickness: Within 1/4 inch.
- D. Variation From Design Elevation: Within 1/2 inch.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 40 00 Quality Requirements, for general requirements for field inspection and testing.
- B. Compaction density testing shall be performed on compacted aggregate base course in accordance with ASTM D1556 or ASTM D6938.
- C. Results will be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with AASHTO T 180, ASTM D698 ("standard Proctor"), or ASTM D1557 ("modified Proctor").
- D. If tests indicate work does not meet specified requirements, remove work, replace and retest.
- E. Proof roll compacted aggregate at surfaces that are under slabs-on-grade and paving.

3.06 CLEANING

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

END OF SECTION

SECTION 32 12 16 ASPHALT PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Single course bituminous concrete paving.
- B. Double course bituminous concrete paving.
- C. Surface sealer.
- D. This section compliments and shall be coordinated with Civil Drawing specifications / requirements. The most stringent requirements shall be utilized.
- E. Asphaltic concrete paving for vehicular traffic and curbs, including necessary patching and repair of damaged new and existing paving.
- F. Patching and repair of existing asphaltic concrete paving for previous damage, for underground utility work and where damaged by new construction.

1.02 RELATED REQUIREMENTS

- A. Section 31 22 00 Grading: Preparation of site for paving and base.
- B. Section 31 23 23 Fill: Compacted subgrade for paving.
- C. Section 32 11 23 Aggregate Base Courses: Aggregate base course.
- D. Section 32 13 13 Concrete Paving: Concrete curbs.
- E. Section
- F. Section 32 17 23.13 Painted Pavement Markings: Concrete bumpers.
 - 1. Parking and Traffic Control Pavement Markings.

1.03 REFERENCE STANDARDS

- A. AI MS-2 Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types; 2015.
- B. AI MS-19 A Basic Asphalt Emulsion Manual; Fourth Edition.
- C. ASTM D946 Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction; 2009a.
- D. 11
 - 1. Standard Specifications shall be as amended and adopted by authorities having jurisdiction, including the San Bernardino.
 - 2. Where reference is made to Standard Details, such reference shall be to the Standard Details accompanying the Standard Specifications, as amended and adopted by the authorities having jurisdiction.
 - 3. Wherever term "Agency" occurs in Standard Specifications, it shall be understood to mean District for purposes of the Contract.
 - 4. Wherever term "Engineer" occurs in Standard Specifications, it shall be understood to mean Architect for purposes of the Contract.

1.04 SUBMITTALS

- A. Materials List: List source and quality standard for all asphaltic concrete materials.
- B. Mix Design:
 - 1. Formulate a job-mix formula using the Hveem method in accordance with ASTM D3763 Section 203-6.2 and submit for approval.
 - 2. Submit designs for asphaltic concrete prepared by a materials laboratory under direct supervision of a Civil Engineer licensed in the State of California or a standard mix design proven in actual performance.
 - 3. Resultant Mixture: Hveem properties conforming to ASTM D3763 Section 203-6.4.3.
- C. Certifications:
 - 1. Weighmaster's Certificates or certified delivery tickets for each truckload of bituminous material delivered to site.
 - 2. Certificates of Conformance: Asphalt, aggregate and sterilant materials.
 - a. 20 days prior to the delivery of aggregates, asphalt materials, and paving mixes to the project site, submit certificates and test results of compliance of such materials with these specifications.
 - b. Submit certificates of compliance from the supplier for bituminous materials for paint binder, asphaltic concrete, and seal coat.
 - c. Submit weigh master's certificates or certified delivery tickets for each truck load of asphaltic material delivered to the project site.
 - d. Upon completion of the weed control treatment, and as a condition for final acceptance, furnish a written certificate stating the brand name of the sterilant and the manufacturer, and that the sterilant used had at least the minimum required concentration, and that the rate and method of application complied in every respect with the conditions and standards contained herein.
- D. Samples:
 - 1. Prior to the delivery of specified aggregate to the site, submit samples of the material for the Inspector's acceptance in accordance with ASTM D3763 Section 4-1.4. Samples shall be typical of materials to be furnished from the proposed source and in conformance with the specified requirements.
 - 2. Provide aggregate base gradation and quality certifications, dated within 30 days of submittal.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with locally adopted ASTM D3763.
- B. Mixing Plant: Conform to Locally adopted 1.
 - 1. Asphaltic Concrete Producers Qualifications: Use only materials furnished by a bulk asphaltic concrete producer regularly engaged in production of hot mix, hot laid bituminous concrete.
 - 2. Applicator Qualifications: Paving machine and roller operators shall be fully trained and experienced in the installation of asphaltic concrete paving on projects of similar size and complexity.

- C. Testing and analysis of granular base material and asphaltic concrete paving mix shall be performed under provisions of Division 1.
- D. Obtain materials from same source throughout.

1.06 REGULATORY REQUIREMENTS

- A. Conform to applicable code for paving work on public property.
- B. Where reference is made to ASTM D3763, the following shall apply.
 - 1. For conditions not indicated otherwise on Contract Drawings, conform to Standard Details adopted by authorities having jurisdiction, including Standard Details for Public Works Construction, as amended and adopted by those authorities.
 - 2. Perform on-site Work as indicated and referenced on Contract Drawings and as specified herein.
- C. The quantity of volatile organic compounds (VOC) used in weed killer, seal coat, tack coat, primer, and other materials shall not exceed limits permitted under current regulations of South Coast Air Quality Management District (AQMD).

1.07 FIELD CONDITIONS

- A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen; or when rain is imminent.
 - 1. Tack Coats: Minimum surface temperature of 60 deg F.
 - 2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
 - 3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.
- B. Place bitumen mixture when temperature is not more than 15 F degrees below bitumen supplier's bill of lading and not more than maximum specified temperature.

PART 2 PRODUCTS

2.01 MATERIALS

- A. General: Aggregate base, prime coat paint binder, bituminous surface course and other materials shall be as noted on the Contract Drawings and shall comply with requirements of authorities having jurisdiction.
- B. Asphalt Cement: ASTM D 946.
- C. Aggregate for Base Course: See Section 32 11 23 Aggregate Base Course.
- D. Asphalt Concrete Materials: ASTM D3763, Subsection 203-6.
- E. Aggregate for Binder Course : Angular crushed washed stone; free of shale, clay, friable material and debris.
- F. Mineral Filler: Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter.
- G. Fiber Reinforcement: Synthetic fibers shown to have long-term resistance to deterioration when in contact with alkalis and moisture; 1/2 inch length.
- H. Crack Filler:

- 1. Cracks less than 1/2 inch in width: GuardTop Crackfiller or equal.
- 2. Cracks 1/2 inch or greater in width: #4 Sheet mix asphalt.
- I. Primer: In accordance with locally adopted 1.
- J. Tack Coat: Homogeneous, medium curing, liquid asphalt.
- K. Seal Coat: AI MS-19, slurry type.
 - 1. Asphalt Emulsion, www.aema.ora., SS1-h, per ASTM D3763 Section 203-9.
 - 2. Acceptable Manufacturers:
 - a. Asphalt Coating Engineering; Sure Seal.
 - b. Diversified Asphalt Product; Over Kote: www.diversifiedasphalt.com.
 - c. SealMaster Pavement Products & Equipment; MasterSeal: sealmaster.net.
 - d. Vulcan Materials Company; GuardTop: www.vulcanmaterials.com.
 - e. Western Colloid Products; Park Top: www.westerncolloid.com.
 - f. Satin Seal by Blue Diamond Co., Long Beach, CA.
 - g. Substitutions: See Section 01 60 00 Product Requirements.

2.02 ASPHALT PAVING MIXES AND MIX DESIGN

- A. Asphalt Surfacing Materials: Provide asphalt surfacing meeting the following requirement, furnished from a commercial asphalt central mixing plant.
- B. Asphalt Paving Mix:
 - 1. Standard Specifications, C2-PG-64-10.
- C. Use dry material to avoid foaming. Mix uniformly.
- D. Base Course: 4.5 to 5.8 percent of asphalt cement by weight in mixture in accordance with ASTM D3763 Section 203-6.4.3, Type B.
- E. Binder Course: 4.5 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.
 - 1. CSS-1 h and conform to the requirements of ASTM D3763, Section 203-3 Emulsified Asphalt.
- F. Parking Lot Wearing Course: 4.6 to 6.0 percent of asphalt cement by weight in mixture in accordance with ASTM D3763, Section 203-6.4.3, Type C2.
 - 1. Provide at least two courses of asphalt when Type C2 asphalt pavement is greater than 3 inches.
 - 2. Surface Course Minimum Thickness: 1 inch and a maximum of 2 inches.
- G. Playground Area Wearing Course: 4.8 to 6.5 percent of asphalt cement by weight in mixture in accordance with ASTM D3763, Section 203-6.4.3, Type D2.
 - 1. Provide at least two courses of asphalt when Type D2 asphalt pavement is greater than 1-1/2 inches.
 - 2. Surface Course Minimum Thickness: 1 inch and a maximum of 1-1/2 inches.
- H. Submit proposed mix design of each class of mix for review prior to beginning of work.

2.03 SOURCE QUALITY CONTROL

- A. Test mix design and samples in accordance with AI MS-2.
- B. Submit asphaltic concrete mix design proposed by the Contractor to the Engineer for review.
- C. Proposed mix to be tested for conformance with the specifications, including grading, asphalt content and stability.

2.04 ACCESSORIES

- A. Headers and Stakes:
 - 1. 2 x 6 inch nominal Redwood, Construction Heart Grade, or preservative treated douglas fir (PTDF), except at curves provide laminated 1 x 6 inch nominal PTD., unless indicated otherwise on Drawings
 - 2. Stakes: 2 x 4 x 18 inch long Redwood, or 2 x 3 x 18 inch long PTDF; at 48 inch on center maximum.
 - 3. Nails: Common, use hot dipped galvanized only, 12d minimum.
- B. Pavement Reinforcing Fabric: Non-woven polypropylene fabric conforming to ASTM D3763, Subsection 213-1.
 - 1. Basis of Design Product: Petromat as manufactured by Propex Fabrics inc.; www.geotextile.com, or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Refer to geotechnical report referenced in section 8 8, provided under separate cover, notes on Contract Drawings, and requirements of authorities having jurisdiction.
- B. Verify that compacted subgrade and granular base is dry and ready to support paving and imposed loads.
- C. Verify gradients and elevations of base are correct.
- D. Fine grading, checking, shaping, and compacting of subgrade shall be complete before start of asphaltic concrete Work.
- E. Soil Sterilant: Sterilize soil areas to receive asphaltic concrete paving. Apply soil sterilant in accordance with manufacturer's instructions and applicable environmental regulations. Take care to confine application to the areas to be paved. See Section 32 11 23 Aggregate Base Courses for product information.
- F. Curbs and Gutters: Gutters shall be in place and cured prior to start of asphaltic concrete Work. Provide lumber ramping at all locations where rolling equipment or vehicles cross new concrete paving, curbs and gutters.
- G. Headers: Place headers with tops flush with finish asphaltic concrete surfaces. Back headers with stakes.
 - 1. Install headers along edge of bituminous surfacing abutting turf, earth, or planting area, unless indicated otherwise.

- 2. Install headers so the bottom surface has continuous bearing on solid grade. Where excavation for headers is undercut, thoroughly tamp soil under the header. Compact backfill on both sides of header to the density of adjacent undisturbed earth.
- 3. Fasten headers in place with redwood or Douglas fir stakes of length necessary to extend into solid grade a minimum of 12 inches. Stakes shall be of sound material, neatly pointed, driven vertically, and securely nailed to headers. Space stakes, not to exceed 4 feet on centers with top of stakes set one inch below top of header. Provide a minimum of 2-12d galvanized common nails through each stake.
- 4. Remove existing headers where new surfacing is installed adjacent to existing surfacing.
- 5. Install temporary headers at transverse joints of paving where continuous paving operations are not maintained.
- 6. Provide additional stakes and anchorage as required to fasten headers in place
- H. Do not asphalt concrete on any surface, which contains ponded water or excessive moisture in the opinion of the Architect or consulting engineer.
 - 1. If paving operations are in progress and rain or fog forces a shut down, loaded trucks in transit shall return to the plant, and no compensation will be allowed therefore.
 - 2. Provide canvas tarpaulins to cover all loads of asphalt from the time that the mixture is loaded until it is discharged from the delivery vehicle, unless otherwise directed in writing.

3.02 BASE COURSE

- A. See Section 32 11 23.
- B. Inspector will examine the base before the paving has begun. Correct any deficiencies before the paving is started.
- C. Wherever asphaltic pavement does not terminate against a curb, gutter, or another pavement, provide and install a redwood or pressure treated Douglas fir header at the line of termination.

3.03 PREPARATION - PRIMER

- A. Apply primer in accordance with manufacturer's instructions.
- B. Apply primer on aggregate base or subbase at uniform rate of 0.25 gal/sq yd.
- C. Apply primer to contact surfaces of curbs, gutters.
- D. Use clean sand to blot excess primer.

3.04 PREPARATION - TACK COAT

- A. Apply tack coat in accordance with ASTM D3763 Section 302-5.4.
- B. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 0.10 gal/sq yd.
- C. Apply tack coat to contact surfaces of curbs, gutters and previously placed or existing paving.
- D. Joining Pavement: Expose, cut and clean edges of existing pavement to straight, vertical surfaces for full depth of existing pavement.
 - 1. Paint edge with asphalt emulsion before placing new asphaltic concrete.

2. Joints in New Paving: In accordance with ASTM D3763.

3.05 PLACING ASPHALT PAVEMENT - SINGLE COURSE

- A. Install Work in accordance with ASTM D3763 Subsection 302-5.
- B. Asphalt concrete of the class indicated in Part 2 shall be laid in courses conforming to ASTM D3763 Table 302-5.5(A), unless otherwise stated herein.
- C. Place asphalt within 24 hours of applying primer or tack coat.
- D. Place thickness as indicated on Civil Drawings to minimum 1 inch compacted thickness.
 - 1. Asphalt concrete work shall include full depth patching and variable thick asphalt concrete transition areas.
 - 2. Provide daily the Inspector, with copies of certificates of weight for all materials delivered to the job site and/or incorporated in the work.
 - 3. At no time shall the coarse aggregate that has segregated from the mix be scattered across the paved mat.
- E. Install gutter drainage grilles and frames and manhole frames in correct position and elevation.
- F. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position.
 - 1. Compact (roll) asphaltic concrete in accordance with ASTM D3763, Subsection 302-5.6, using machine rollers.
 - a. Compaction by vehicular traffic is prohibited.
 - b. Compact areas inaccessible to rolling equipment with machine-powered tamper.
- G. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.06 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

- A. Provide at least two courses of asphalt when Type D2 asphalt pavement is greater then 1-1/2 inches. The surface course shall be a minimum thickness of 1 inch and a maximum of 1-1/2 inches.
- B. Provide at least two courses of asphalt when Type C2 asphalt pavement is greater then 3 inches. The surface course shall be a minimum thickness of 1 inch and a maximum of 2 inches.
- C. Install Work in accordance with ASTM D3763 Subsection 302-5.
- D. Place asphalt binder course within 24 hours of applying primer or tack coat.
- E. Place binder course to thickness as indicated on Civil Drawings, minimum 1 inch compacted thickness.
- F. Place wearing course within two hours of placing and compacting binder course.
- G. Place wearing course to thickness as indicated on Civil Drawings, minimum 1 inch compacted thickness.
- H. Install gutter drainage grilles and frames and manhole frames in correct position and elevation.
- I. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position.
 - 1. Compact (roll) asphaltic concrete in accordance with ASTM D3763, Subsection 302-5.6, using machine rollers.
 - a. Compaction by vehicular traffic is prohibited.
 - b. Compact areas inaccessible to rolling equipment with machine-powered tamper.
- J. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.07 SEAL COAT

- A. Apply seal coat after surface course application, in accordance with manufacturer's recommendations.
- B. Apply seal coat to surface course and asphalt curbs in accordance with 1, Subsection 302-8.2.
- C. Add water to specified seal coat material. When air temperatures of 90 degrees F or more are encountered during application, consult manufacturer for recommendations.
- D. If pavement surface exhibits imperfections of roller marks, rock pockets, ridges or depressions as determined by the Architectt, the addition of sand aggregate to seal coat, and amounts thereof, shall be as recommended by the manufacturer.
- E. A second application shall be made after first coat has dried to the touch. When sand is added to the first seal coat, two additional coats without extra sand shall be applied.
- F. Allow seal coat to dry before permitting traffic or striping.

3.08 PAVEMENT REPAIR AND PAVING

- A. Preparation of existing pavement: Where indicated, remove loose asphaltic concrete, cleanout "pot holes" and cracks, remove dirt, oil and other foreign materials.
- B. Repair holes with full paving section as specified. Repair "alligatoring" with asphalt "skin-patch". Fill all cracks larger than 1/4 inch wide with asphalt emulsion slurry.
- C. Tack Coat: Apply asphalt oil AR-4000 or AR-8000, as required for jobsite condition, at metered application rate of no less than a range from .2 to .3 gallons per square yard of fabric or as directed by manufacturer and to provide 100 percent fabric saturation and ample bonding for paving section.
- D. Fabric Reinforcement: Place fabric smooth side up in tack coat with 2 to 4 inch overlap. Hand-broom to remove wrinkles. Apply addition tack coat to joints and between overlapped fabric layers.
- E. Overlay Asphalt: Place single course asphalt, 1-1/2 inch compacted thickness, in conformance with specified standards in this section.

3.09 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Compacted Thickness: Within 1/4 inch of specified or indicated thickness.
- C. Variation from True Elevation: Within 1/2 inch.

3.10 FIELD QUALITY CONTROL

- A. See Section 01 40 00 Quality Requirements, for general requirements for quality control.
- B. Provide field inspection and testing. Take samples and perform tests in accordance with AI MS-2.
- C. Pavement at all longitudinal joints shall have a Field Density of 95%, as described in ASTM D3763 Section 302-5.6.2.
 - 1. When the test results of the field cores are less than 95% Relative Compaction, remove a 1 foot wide section on each side of the longitudinal joint.
 - 2. Replace the removed pavement with an asphalt mix that meets the job specification at no additional cost to the District.
- D. Test: Flood test all paving to demonstrate positive drainage.
 - 1. Before acceptance, water test all pavements to ensure proper drainage as directed by the Inspector.
 - 2. Flooding Method: By water tank truck.
 - 3. Fill depressions where the water ponds to a depth of more than 1/8 inch; or the slope corrected to provide proper drainage.
 - 4. The edges of the fill shall be feathered and smoothed so that the joint between the fill and the original surface is invisible.
 - 5. No standing water shall remain 1-hour after test.

3.11 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury for 2 days or until surface temperature is less than 140 degrees F.
 - 1. After final rolling, prohibit all traffic on asphaltic concrete until mix has fully cooled and set. Minimum time, in all cases shall be 6 hours.

3.12 CLEANING

- A. After completion of paving operations, clean all existing and new improvements that have been soiled, especially by oil tracking from asphalt tanks or placement in general.
- B. For Substantial Completion review, broom clean and wash paving with hoses. Clean residue from landscaping installation.

END OF SECTION

SECTION 32 13 13 CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete sidewalks, stair steps, and integral curbs.

1.02 RELATED REQUIREMENTS

- A. Section 03 10 00 Concrete Forming and Accessories.
- B. Section 03 20 00 Concrete Reinforcing.
- C. Section 03 30 00 Cast-in-Place Concrete.
- D. Section 31 22 00 Grading: Preparation of site for paving and base and preparation of subsoil at pavement perimeter for planting.
- E. Section 32 11 23 Aggregate Base Courses: Typical base course.
- F. Section 32 12 16 Asphalt Paving: Asphalt wearing course.

1.03 REFERENCE STANDARDS

- A. ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).
- B. ACI 301 Specifications for Structural Concrete; 2016.
- C. ACI 304R Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
- D. ACI 305R Guide to Hot Weather Concreting; 2010.
- E. ACI 306R Guide to Cold Weather Concreting; 2016.
- F. ACI 318 Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2017).
- G. ADA Standards Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- H. ASTM A615/A615M Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2016.
 - 1. Use 2012 as indicated in 2016 CBC Referenced Standards.
- I. ASTM C33/C33M Standard Specification for Concrete Aggregates; 2016, with Editorial Revision (2016).
 - 1. Use 2013 as indicated in 2016 CBC Referenced Standards.
- J. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine; 2011.
- K. ASTM C39/C39M Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2017b.
- L. ASTM C920 Standard Specification for Elastomeric Joint Sealants; 2014a.
- M. ASTM C94/C94M Standard Specification for Ready-Mixed Concrete; 2016a.

- 1. Use 2014a as indicated in 2016 CBC Referenced Standards.
- N. ASTM C150/C150M Standard Specification for Portland Cement; 2016.
 - 1. Use 2012 as indicated in 2016 CBC Referenced Standards.
- O. ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
- P. ASTM C494/C494M Standard Specification for Chemical Admixtures for Concrete; 2016.
- Q. ASTM D1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
- R. ASTM D1752 Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2004a (Reapproved 2013).
- S. 11
 - 1. Standard Specifications shall be as amended and adopted by authorities having jurisdiction, including San Bernardino.
 - 2. Where reference is made to Standard Details, such reference shall be to the Standard Details accompanying the Standard Specifications, as amended and adopted by the authorities having jurisdiction.
 - 3. Wherever term "Agency" occurs in Standard Specifications, it shall be understood to mean District for purposes of the Contract.
 - 4. Wherever term "Engineer" occurs in Standard Specifications, it shall be understood to mean Architect for purposes of the Contract.

1.04 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Mix Design: Design mixes for each concrete mix.
- C. Product Data: Provide data on joint filler, admixtures, and curing compound.
 - 1. Material Certificates signed by manufacturers for each of the following:
 - a. Cementitious materials and aggregates.
 - b. Steel reinforcement and reinforcement accessories.
 - c. Admixtures.
 - d. Curing compounds.
 - e. Joint fillers.
- D. Shop drawings: For pattern layout and verification.

1.05 QUALITY ASSURANCE

- A. Industry Standard: Perform concrete paving Work in accordance with ACI 301.
- B. Regulatory Requirements: Where reference is made to Standard Specifications, the following shall apply.
 - 1. Where reference is made to Standard Specifications, the following shall apply:

- a. Perform off-site Work in public rights-of-way as indicated on the Contract Drawings and in accordance with requirements of authorities having jurisdiction, including ASTM D3763.
 - For conditions not indicated otherwise on Contract Drawings, conform to Standard Details adopted by authorities having jurisdiction, including ASTM D3763.
- b. Perform on-site Work as indicated and referenced on the Contract Drawings and as specified herein.
- 2. Conform to California Code of Regulations (CCR), Volume 2, Part 2, Chapters 18 and 19.
- 3. Conform to California Building Code (CBC), Chapter 11B and ADAAG for accessibility requirements.
 - a. Portland cement concrete paving shall be stable, firm, and slip resistant and shall comply with CBC Sections 11B-302 and 11B-403.
 - b. Concrete paving and concrete finishes along accessible routes of travel shall be at least as slip-resistant as that described as a medium salted finish for slopes of less than 6%, and slip resistant at slopes of 6% or greater; CBC 11B-403.2.
 - c. Continuous surfaces, including walks and sidewalks, shall have a continuous common surface, not interrupted by steps or by abrupt changes in level exceeding 1/4 inch vertical (CBC 11B-303.2), or beveled at 1:2 slope to a maximum height of 1/2 inch (CBC 11B-303.3) and shall have a minimum width of 48 inches; CBC 11B-403.5.1.
- 4. Comply with OSHA and Cal-OSHA requirements.
- 5. Surface cross slopes shall not exceed 2 percent on any accessible path of travel.
- C. Source Quality Control: Obtain like materials from one source throughout.
- D. Lines and Levels: Established by State of California licensed Surveyor or registered Civil Engineer. Costs of surveying services shall be included in the Contract Sum.
- E. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.
 - 1. The Installer shall provide a qualified foreman or supervisor who has a minimum of three years experience with imprinted and textured concrete, and who has successfully completed at least five similar installations of high quality and similar in scope to that required.

1.06 DELIVERY, STORAGE AND HANDLING

A. Delivery, Storage and Handling: Comply with requirements specified for regular concrete in Section 03 30 00 - Cast in Place Concrete.

PART 2 PRODUCTS

2.01 PAVING ASSEMBLIES

- A. Comply with applicable requirements of ACI 301.
- B. Concrete Sidewalks: 3,250 psi 28 day concrete, thickness as indicated on Drawings, minimum 4 inches, natural grey color Portland cement.

- C. Curbing, gutters, related drainage components: 2,500 psi, 28 day concrete.
- D. Parking Area Pavement: 3,000 psi 28 day concrete, thickness as indicated on Civil Drawings thick, reinforcing as indicated on Civil Drawings, finish as indicated on Drawings.

2.02 FORM MATERIALS

- A. Wood form material, profiled to suit conditions.
- B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
 - 1. Thickness: 1/2 inch.

2.03 REINFORCEMENT

- A. General: As indicated on Drawings and specified following. Reinforcement for portland cement concrete paving in public rights-of-way shall comply with all applicable requirements in the Standard Specifications for Public Works Construction and Standard Details, as adopted by local authorities having jurisdiction.
- B. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) yield strength; deformed billet steel bars; unfinished.
 - 1. Unless detailed otherwise on Drawings, provide number 4 reinforcing bars at 24 inches on center, each way.
- C. Tie Wires: 18 gage minimum, black annealed steel.
- D. Construction Joint Reinforcing:
 - 1. Dowels: ASTM A615/A615M, Grade 60 60,000 psi yield strength; deformed billet steel bars; unfinished finish.

2.04 PERFORMANCE REQUIREMENTS

A. Albedo reflectance of finish concrete shall be minimum 0.30.

2.05 CONCRETE MATERIALS

- A. Obtain cementitious materials from same source throughout.
- B. Cement: ASTM C150/C150M, Normal Type I Portland cement, gray color.
- C. Fine and Coarse Mix Aggregates: ASTM C33/C33M Table 3 Class 4M, Non-reactive.
 - 1. Class C per ASTM D3763 Section 201-1.3.2 // Section 73 and 90.
- D. Water: Clean, and not detrimental to concrete.
- E. Chemical Admixtures: ASTM C494/C494M, Type A Water Reducing, Type B Retarding, Type D Water Reducing and Retarding, Type F Water Reducing, High Range, and Type G Water Reducing, High Range and Retarding.
 - 1. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

2.06 ACCESSORIES

- A. Curing Compound: ASTM C309, Type 1, Class A.
 - 1. Comply with all applicable air pollution requirements.

- B. Tactile Warning Surfaces: See Section 32 17 26.
- C. Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C920, Class 25, Uses T, I, M and A; single component.
 - 1. Color: Gray.
 - 2. Applications: Use for:
 - a. Joints in sidewalks and vehicular paving.
 - 3. Products:
 - a. Pecora Corporation; NR-201 Self-Leveling Traffic and Loop Sealant: www.pecora.com.
 - b. Sherwin-Williams Company; Stampede 1SL Polyurethane Sealant: www.sherwin-williams.com.
 - c. Substitutions: See Section 01 60 00 Product Requirements.
- D. Soil Sterilant: As specified in Standard Specifications for Public Works Construction. Soil sterilant shall comply with all applicable environmental protection and hazardous materials laws and regulations.
 - 1. See Section 32 11 23 Aggregate Base Course for product.
- E. Headers and Stakes: Pressure preservative treated douglas fir, 2 x 6 inch nominal size except at curves provide laminated 1 x 6 inch. Use hot dipped galvanized nails only.
- F. Expansion Joint Filler: ASTM D1751, premolded, compressible 1/2 inch thick non-extruding bituminous type resilient filler, compatible with joint backing and sealing products.

2.07 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Mix for Pedestrian (Sidewalk) Pavements, Natural Color, unless indicated otherwise: ASTM D3763, Section 201-1.1.2 Class 520-B-3000, with minimum slump of 4 inches.
- C. Concrete Mix for Trash Enclosure and other Exterior Slabs on Grade: ASTM C94/C94M -Ready-Mixed Concrete, Alternative No. 2, minimum 28 day compressive strength as indicated on Drawings or, if not indicated; 3000 psi.
- D. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- E. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
 - 1. Use accelerating admixtures in cold weather or set retarding admixtures in hot weather only when approved by Architect. Do not use calcium chloride.
- F. Concrete Properties:
 - 1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; As indicated on drawings.
 - 2. Water-Cement Ratio: Maximum 50-60 percent at point of placement, or according to indicated concrete strength.

3. Maximum Slump: 4 inches.

2.08 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify compacted stabilized soil is acceptable and ready to support paving and imposed loads.
- B. Fine grading, checking, shaping, and compacting of subgrade shall be complete before start of concrete paving Work.
- C. Verify gradients and elevations of base are correct.

3.02 SUBBASE

- A. Prepare subbase in accordance with local community adopted version of 1 standards.
- B. For pavement subject to vehicular traffic, provide sub-base and aggregate base material specified in Section 32 11 23 Aggregate Base Courses and as indicated on the Drawings.
- C. Aggregate base is not required under Portland cement concrete paving subject only to pedestrian traffic in normal use.

3.03 PREPARATION

- A. Project Conditions:
 - 1. Water and Dust Control: Maintain control of concrete dust and water at all times. Do not allow adjacent planting areas to be contaminated.
 - 2. Do not place pavement when base surface or ambient temperature is less than 40 degrees F or if base surface is wet or frozen.
 - 3. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Moisten base to minimize absorption of water from fresh concrete. Do not place concrete on standing water.
- C. Notify Architect minimum 24 hours prior to commencement of concreting operations.
- D. Curbs and Gutters: Schedule portland cement concrete curbs and gutters to be in place and cured prior to start of adjoining asphaltic concrete and portland cement concrete paving Work.

3.04 COORDINATION WITH EXISTING CONSTRUCTION

- A. Connection to Existing Construction: Where new concrete is doweled to existing construction, drill holes in existing concrete, insert steel dowels and pack with non-shrinking grout.
- B. Preparation of Existing Concrete: Prepare previously placed concrete by cleaning with steel brush and apply bonding agent in accordance with manufacturer's instructions.

3.05 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
 - 1. Surfaces and Edges: Except where special finishes and tooled edges are indicated, provide all exposed finish surfaces of dense concrete with sharp arises and outside corners.
 - 2. Recesses and Openings: As indicated on Drawings or as directed.
- B. See Section 03 10 00 Concrete Forming and Accessories.
- C. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
 - 1. Remove side forms for sidewalks, gutter depressions, island paving and driveways, not less than 12 hours after the finishing has been completed.
- D. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.06 REINFORCEMENT

- A. Place reinforcement at midheight of slabs-on-grade.
- B. Reinforcement Placement, General: Locate reinforcement as indicated on Drawings or in Standard Specifications, whichever is more stringent.
 - 1. Locate reinforcement to provide required cover by concrete. If not otherwise indicated on Drawings or in Standard Specifications, provide concrete cover in compliance with ACI 318, Table 3.3.2.3.
 - 2. Place, support and secure reinforcement against displacement.
- C. Reinforcement Spacing: Space reinforcement as indicated on Drawings or in Standard Specifications, whichever is more stringent. If not indicated, maintain clear spacing of two times bar diameter but not less than 1-1/2 inch nor less than 1-1/3 times maximum size aggregate.
- D. Coordination: Locate reinforcement to accommodate embedded products and formed openings and recesses.
- E. Reinforcement Supports: Provide load bearing pads under supports or provide precast concrete block bar supports.
- F. Interrupt reinforcement at contraction and expansion joints.
- G. Place dowels to achieve pavement and curb alignment as detailed.
 - 1. Secure tie dowels in place before depositing concrete. Provide No. 3 bars, 18 inch long at 24 inches O.C. for securing dowels where no other reinforcement is provided.

3.07 COLD AND HOT WEATHER CONCRETING

- A. Follow recommendations of ACI 305R when concreting during hot weather.
- B. Follow recommendations of ACI 306R when concreting during cold weather.
- C. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

3.08 PLACING CONCRETE

- A. Mixing: If batch plant is within travel time not exceeding maximum limits, transit mix concrete in accordance with ASTM C94/C94M. If travel time exceeds limits, provide alternative means for mixing and submit for review and approval.
- B. Place concrete in accordance with ACI 304R.
- C. Do not place concrete when base surface is wet.
- D. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- E. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.
- F. Use internal vibration to consolidate concrete around reinforcing per industry guidelines.

3.09 JOINTS

- A. Align curb, gutter, and sidewalk joints.
- B. Place 1/2 inch wide expansion joints as indicated on Drawings (if not indicated provide at 20 foot intervals) and to separate paving from vertical surfaces and other components and in pattern indicated.
 - 1. Place in all concrete walks, other exterior flatwork and concrete curbs and gutters.
 - 2. If expansion joints are not indicated, comply with standard details and specifications of authorities having jurisdiction, including Standard Details for Public Works Construction and Standard Specification for Public Works Construction, as applicable.
 - 3. Place expansion control filler to correct elevation and profile. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
 - 4. Secure to resist movement by wet concrete.
 - 5. Coordinate locations to align expansion joints in adjoining concrete walks, curbs, gutters and other exterior flatwork.
 - 6. Provide expansion joints also at beginning and end of all curved segments.
 - 7. Provide expansion joints also at intersections of concrete curbs and gutters and building footing.
 - 8. Provide expansion joints also at intersections of concrete paving and building footing.
 - 9. Lay out expansion joint locations to occur where possible at penetrations such as handrail posts and columns.
 - 10. Place expansion control filler to correct elevation and profile.
- C. Provide scored joints:
 - 1. As indicated on Drawings. If not indicated, locate joints in compliance with Standard Details and as indicated below.
 - 2. Evenly spaced at maximum 5 feet intervals for vehicular paving and 5 feet for pedestrian paving.
 - 3. Between sidewalks and curbs.
 - 4. Between curbs and pavement.

- 5. Lay out control joint locations to occur at penetrations such as handrail posts and columns and where shown on Drawings.
- 6. Refer to Architectural, Landscape and Civil Drawings for additional information and joint locations.
- D. Provide keyed joints as indicated.
- E. Saw cut contraction joints 1/8 inch wide at an optimum time after finishing. Cut 1/3 into depth of slab.

3.10 FINISHING

- A. Area Paving: Medium broom, texture perpendicular to pavement direction.
- B. Concrete Paving Finish: ACI 301, two-step trowel finish, followed after surface has achieved initial set by flooding of surface and light rubbing with bristle brush so that concrete fines are exposed slightly.
 - 1. Finish surface less than 6 percent shall receive medium broom finish resembling medium grit sandpaper. CBC 11B-403 and 11B-302.1.
 - 2. Finish surface greater than 6 percent shall receive heavy broom finish. CBC 11B-403 and 11B-302.1.
 - 3. Surfaces shall have static coefficients of friction of 1.3 to 1.6 (dry) and 1.2 to 1.4 (wet) when field tested in accordance with ASTM D2047.
- C. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.
 - 1. Broomed: Pull broom across freshly floated concrete to produce medium texture in straight lines perpendicular to main line of traffic. Do not dampen brooms.
 - 2. Tooled Joints: 1-inch deep by 3/16-inch wide tooled joints with 1/8-inch radius corners.
- D. Curbs and Gutters: Comply with Standard Specifications.
- E. Specific Finishes:
- F. Curing and Sealing:
 - 1. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.
 - 2. Integrally Colored Concrete: Apply curing compound for integrally colored concrete according to manufacturer's instructions using manufacturer's recommended application techniques. Apply curing and sealing compound at consistent time for each pour to maintain close color consistency.
 - a. Curing compound shall be same color as the colored concrete and supplied by same manufacturer of the colored admixture.
 - 3. Precautions shall be taken in hot weather to prevent plastic cracking resulting from excessively rapid drying at surface as described in CIP 5 Plastic Shrinkage Cracking published by the National Ready Mixed Concrete Association.
 - 4. Do not cover concrete with plastic sheeting.

3.11 JOINT SEALING

A. See Section 3948 - 3948 for joint sealer requirements.

3.12 TOLERANCES

- A. ACI 301, Class B, except paving in public rights-of-way shall comply with the Standard Specifications.
- B. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
- C. Maximum Variation From True Position: 1/4 inch.
- D. Control-joint grooves and other conspicuous lines:
 - 1. 1/4 inch maximum in any 20 feet.
 - 2. 1/2 inch maximum in any 40 feet.
- E. Variation in Cross-Sectional Thickness of Slabs:
 - 1. Minus 1/4 inch.
 - 2. Plus 1/2 inch.
- F. Variation in Radii
 - 1. In radii of less than 10 feet:
 - a. 1/8 inch in any 5 feet.
 - b. 1/4 inch in any 10 feet.
 - 2. In radii of 20 feet:
 - a. 1/4 inch in any 10 feet.
 - b. 3/8 inch in any 20 feet
 - 3. 3. In radii of 30 feet or more:
 - a. 1/2 inch in any 20 feet.
 - b. 1 inch in any 30 feet.
- G. Coefficient of Friction for Finish Surface:
 - 1. Pedestrian Vehicular Finish Surface: Minimum 0.6 static coefficient of friction is required for all concrete paving finish surface. All concrete paving surfaces to be broom finish.
 - 2. Ramps: Minimum 0.8 static coefficient of friction is required for all concrete paving finish surfaces on ramps. All concrete paving surfaces on ramps to be broom finish.

3.13 FIELD QUALITY CONTROL

- An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
 - 1. Provide free access to concrete operations at project site and cooperate with appointed firm.
 - 2. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
 - 3. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- B. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 75 cu yd or less of each class of concrete placed each day.

- 1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- 2. Perform one slump test for each set of test cylinders taken.
- C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.14 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian traffic over pavement until 75 percent design strength of concrete has been achieved.

END OF SECTION

SECTION 32 17 23.13

PAINTED PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Parking lot markings, including parking bays, crosswalks, arrows, accessibility symbols, and curb markings.
- B. "No Parking" curb painting.

1.02 RELATED REQUIREMENTS

- A. Section 32 12 16 Asphalt Paving.
- B. Section 32 1313 Concrete Paving: Surface for painting.
- C. Section 32 17 26 Tactile Warning Surfacing: Plastic tactile and detectable warning tiles for pedestrian walking surfaces.

1.03 REFERENCE STANDARDS

- A. ADA Standards Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. FED-STD-595C Colors Used in Government Procurement (Fan Deck); 2008 (Chg Notice 1).
- C. FS TT-B-1325 Beads (Glass Spheres); Retro-Reflective; Rev. D, 2007.
- D. FS TT-P-1952 Paint, Traffic Black, and Airfield Marking, Waterborne; Rev. E, 2007.
- E. MPI (APL) Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com.
- F. FHWA MUTCD Manual on Uniform Traffic Control Devices for Streets and Highways; U.S. Department of Transportation, Federal Highway Administration; Current Edition.
- G. SAE AMS-STD-595 Colors Used in Government Procurement; 2017a.
- H. SCAQMD 1113 South Coast Air Quality Management District Rule No.1113; current edition.

1.04 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Certificates: Submit for each batch of paint and glass beads stating compliance with specified requirements.
- D. Maintenance Materials: Furnish the following for District's use in maintenance of project.
 - 1. See Section 01 60 00 Product Requirements, for additional provisions.
 - 2. Extra Paint: 2 containers, 1 gallon size, of each type and color.

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. See Section 01 61 16 Volatile Organic Compound (VOC) Content Restrictions regarding CalGreen requirements.
 - a. Comply at time of installation with Air Quality standards of:
 - 1) South Coast Air Quality Management District, SCAQMD 1113.
 - 2) California Air Resources Board (CARB).
 - 2. For accessibility markings see Part 3 Article "Installation".
 - 3. Conform to State of California, Department of Transportation (CALTRANS) Standard Specifications, Section 84, Traffic Control Markings, as amended and adopted by authorities having jurisdiction.
 - 4. Where reference is made to Standard Specifications, the following shall apply.
 - a. Perform off-site Work in public rights-of-way in accordance with requirements of authorities having jurisdiction. For conditions not indicated otherwise on Contract Drawings, conform to Standard Details adopted by authorities having jurisdiction.
 - b. Perform on-site Work as indicated and referenced on the Contract Drawings and as specified herein.
- B. Applicator Qualifications: Company regularly engaged in pavement marking, well-experienced in use of machine-applied painted stripes and other markings, with three years of verifiable experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver paint in containers of at least 5 gallons accompanied by batch certificate.
- B. Deliver glass beads in containers suitable for handling and strong enough to prevent loss during shipment accompanied by batch certificate.
- C. Store products in manufacturer's unopened packaging until ready for installation.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

- A. Do not install products under environmental conditions outside paint manufacturer's absolute limits.
 - 1. Do not apply marking paint when weather is foggy or rainy, or when ambient or pavement temperatures are below 40 degrees F., or when such conditions are anticipated within eight hours of application.
- B. Do not apply marking paint when wind velocity causes uncontrollable overspray or excessively rapid drying.
- C. Sequence and Schedule: Apply pavement markings after asphaltic concrete and portland cement concrete and interlocking concrete paving Work are complete and properly cured and, if applicable, sealer has been applied to asphaltic concrete and landscaping Work is complete.

PART 2 PRODUCTS

2.01 MATERIALS

- A. General: Provide standard factory-mixed, quick drying and non-bleeding colors, conforming to Standard Specifications, as amended and adopted by the AHJ, City, and County, as applicable.
- B. Line and Zone Marking Paint: Rapid Dry, Oil Base, VOC Compliant, MPI No. 97 Latex Traffic Marking Paint; color(s) as indicated.
 - 1. Parking Lots: Fast-dry type. If required by authorities having jurisdiction for Work in public rights-of-way, include reflective material in paint. Paint for marking curbs shall not require reflective material. See Color Schedule in Part 3.
 - 2. Accessibility Symbols: Blue shall conform to Color No. 15090, FED-STD-595C, (SAE AMS-STD-595).
 - 3. Substitutions: See Section 01 60 00 Product Requirements.
- C. Paint For Obliterating Existing Markings: FS TT-P-1952; black for bituminous pavements, gray for portland cement pavements.
- D. Reflective Glass Beads: FS TT-B-1325, Type I (low index of refraction), Gradation A (coarse, drop-on); with silicone or other suitable waterproofing coating to ensure free flow.
 - 1. Comply with CALTRANS State Specification No. 8010-51J-22, Type II, and CBC Section 11B-502.6 Identification.
- E. Temporary Marking Tape: Preformed, reflective, pressure sensitive adhesive tape in color(s) required; Contractor is responsible for selection of material of sufficient durability as to perform satisfactorily during period for which its use is required.
- F. Tactile Warning Surfaces: See Section 32 17 26.
- G. Raised Reflective Pavement Markers
 - 1. Specified Manufacturer: Pac-Tec, Inc., Heath, OH (800) 848-7025; local source Western Highway Products (800) 479-3783.
 - 2. Ray-O-Lite Raised Reflective Pavement Markers:
 - a. Molded optic grade Methyl Methacrylate conforming to ASTM D4802 with fill material consisting of thermosetting compound designed for impact and wear resistance.
 - b. Optical Performance: Reflective intensity of reflecting surface at 1/5 degree divergence angle shall be not less than the following when the incident light is parallel.

Horiz. Eng. Angle	Blue
0 Degrees	3.0
20 Degrees	1.5

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Clean surfaces thoroughly prior to installation.
 - 1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.
 - 2. Completely remove rubber deposits, existing paint markings, and other coatings adhering to the pavement, by scraping, wire brushing, sandblasting, mechanical abrasion, or approved chemicals.
- D. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.
- E. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.
 - 1. Lay out markings as shown on Drawings. Use guide lines, templates and forms for precise edges and spacings.
 - a. At off-site and on-site public rights-of-way, obtain review and approval of layout by authorities having jurisdiction.
- F. Temporary Pavement Markings: When required or directed by Architect, apply temporary markings of the color(s), width(s) and length(s) as indicated or directed.
 - 1. After temporary marking has served its purpose, remove temporary marking by carefully controlled sandblasting, approved grinding equipment, or other approved method so that surface to which the marking was applied will not be damaged.
 - 2. At Contractor's option, temporary marking tape may used in lieu of temporary painted marking; remove unsatisfactory tape and replace with painted markings at no additional cost to District.

3.03 INSTALLATION

- A. Regulatory Accessibility Requirements for Installation:
 - 1. Pavement markings for disability requirements shall meet requirements of California Building Code (CBC), Title 24, Part 2, Chapter 11B and ADA Accessibility Guidelines for Buildings and Facilities, per latest amendments.

- a. Accessible parking spaces serving a particular building or facility shall be located, and dispersed if serving more than one accessible entrance, on the shortest accessible route to an entrance or to multiple accessible entrances. CBC Sections 11B-208.3.1
- b. Accessible parking spaces in a parking facility not serving a particular building or facility shall be located on the shortest accessible route to an accessible pedestrian entrance of the parking facility. CBC Sections 11B-208.3.1
- c. Minimum number of required accessible parking spaces shall be provided in accordance with CBC Table 11B-208.2 for each parking facility provided.
- d. For every six or fraction of six accessible parking spaces, at least one shall be an accessible van parking space. CBC Section 11B-208.2.4
- e. Accessible parking spaces and access aisles shall comply with CBC Section 11B-502 and shall be dimensioned to the centerline of the marked lines as follows:
 - 1) Parking spaces and access aisles shall be marked according to CBC Figures 11B-502.2, 11B-502.3, and 11B-502.3.3.
 - (a) Their surfaces shall comply with CBC Section 11B-302 and shall be at the same level with slopes not steeper than 1:48 in any direction. CBC Section 11B-502.4.
 - Parking spaces shall be 9 x 18 feet minimum and van parking spaces shall be 12 x 18 feet minimum with an adjacent access aisle of 5 x 18 feet minimum.
 - (a) Access aisles shall be placed on either side of the parking spaces except be located on the passenger side for van parking spaces.
 - (b) Van parking spaces shall be permitted to be 9 x 18 feet minimum where the access aisle is 8 x 18 feet minimum.
 - 3) Access aisles shall be marked by a blue painted borderline around their perimeter.
 - (a) The area within the blue borderlines shall be marked with hatched lines a maximum of 36 inches on center in a color contrasting with that of the aisle surface, preferably blue or white.
 - (b) Access aisle markings may extend beyond the minimum required length. CBC Section 11B-502.3.3
 - 4) Access aisles (parking spaces as well- similar application) shall not overlap the vehicular way. CBC Section 11B-502.3.4
 - 5) A vertical clearance of 98 inches minimum shall be provided for accessible parking spaces, access aisles, and vehicular routes serving them. CBC Section 11B-502.5
- 2. At least one passenger loading zone shall be provided in every continuous 100 linear feet of loading zone space, or fraction thereof, complying with CBC Sections 11B-209 and 11B-503 as follows:
 - a. Vehicle pull-up spaces shall be 9 x 20 feet minimum.
 - 1) Access aisles shall be 5 x 20 feet minimum and shall be adjacent and parallel to the vehicular pull-up spaces.
 - 2) They shall be at the same level with slopes not steeper than 1:48 in any direction. CBC Section 11B-503.4
 - b. Access aisles for passenger drop-off and loading zone shall be marked with a painted borderline around their perimeter.

- The area within the borderlines shall be marked with hatched lines a maximum of 36 inches on center in a color contrasting with that of the aisle surface. CBC Section 11B-503.3
- c. A vertical clearance of 114 inches minimum shall be provided for vehicle pull-up spaces, access aisles, and a vehicular route serving them connecting a vehicular entrance and a vehicular exit. CBC Section 11B-503.5
- 3. Bus loading zones and bus stops shall comply with CBC Sections 11B-209 and 11B-810.2 as follows:
 - a. Boarding and alighting areas shall be of 8 x 5 feet minimum, with 8 feet measured perpendicular to the curb or vehicle roadway edge, and with 5 feet measured parallel to the vehicle roadway.
 - 1) Slopes in 8 foot direction shall be 1:48 maximum.
 - 2) Slopes in 5 foot direction shall be the same as that of the roadway, to the maximum extent practicable. CBC Figure 11B-810.2.2.
 - Bus shelters shall provide a minimum 30 x 48 inches clear floor or ground space (36 x 48 inches or 36 x 60 inches as applicable in an alcove), with slopes not steeper than 1:48 in any direction, entirely within the shelter complying with CBC Section 11B-305.
 - Bus shelters shall be connected by an accessible route complying with CBC Section 11B-402 to a boarding and alighting area complying with CBC Section 11B-810.2; CBC Figure 11B-810.3.
- 4. Electric Vehicle Charging Stations:
 - a. Where Electric Vehicle Charging Stations are provided, they shall be provided in accordance with CBC Section 11B-228.3, Table 11B-228.3.2.1 and CBC Section 11B-812 (see 11 11 36.13 Electric Vehicle Charging Station for additional requirements).
 - b. Accessibility requirements for Public Use or Common Use EVCS facilities:
 - Vehicle spaces and access aisles serving them shall comply with CBC Section 11B-302. Access aisles shall be at the same level as the vehicle space they serve. Changes in level, slopes exceeding 1:48, and detectable warnings shall not be permitted in vehicle spaces and access aisles. CBC Section 11B-8J2.3
 - 2) Vehicle spaces, access aisles serving them and vehicular routes serving them shall provide a vertical clearance of 98 inches minimum. CBC Section 11B-812.4
 - 3) Accessible routes between EVCS parking, equipment and the building or facility served shall be provided per CBC Section 11B-812.5
 - Vehicle spaces for van accessible, standard accessible, ambulatory and drive-up EVCS shall meet minimum length and width requirements per CBC Section 11B-812.6. All EVCS stalls shall be marked "EV Charging Only" per CBC Section 11B-812.9 and Figure 11B-812.9.
 - 5) Access aisles for van accessible and standard accessible EVCS shall meet minimum length and width requirements and be marked per CBC Section 11B-812.7 the color of the perimeter, hatch lines and "No Parking" letters shall contrast with the surface color (blue color required for use at non-EVCS accessible parking shall not be used).
 - 6) ISA Signs:

- (a) Where four or fewer total EVCS are provided, identification with an International Symbol of Accessibility (ISA) shall not be required.
 - (1) Where five to twenty-five total EVCS are provided, one van-accessible EVCS shall be identified with an ISA complying with section CBS Section 11B-703.7.2.1. The required standard accessible EVCS shall not be required to be marked with an ISA.
 - (2) Where twenty-six or more EVCS are provided, all required van-accessible and all required standard accessible EVCS shall be identified with an ISA.
 - (3) The required ISA identification sign shall be reflective with a minimum 70 square inches, shall be visible from the EVCS it serves. The sign shall be permanently posted either immediately adjacent to the vehicle space or within the projected vehicle space at the head end of the vehicle space. Signs identifying van accessible vehicle spaces shall contain the designation "Van Accessible". Signs shall be minimum 60 inches above the finish surface except that if the sign projects into a pedestrian circulation area, they shall be minimum 80 inches above finish surface CBC Section 11B-812.8
- 7) Ambulatory EVCS complying with CBS Section 11B-812.6.3 shall be required where 26 or more EVCS are provided. CBC table 11B-228.3.2.1
- B. General: Using proper masking, stencils and application equipment, apply marking paint at rate recommended by paint manufacturer or approximately one gallon per 150 square feet (equivalent to approximately one gallon for 450 lineal feet of 4-inch wide stripe), whichever is greater.
 - 1. Equipment shall be capable of operating at 125 psi air pressure, agitate paint constantly and hold exactly to the alignment.
 - 2. Equipment used for applying reflectorized striping shall be equipped with a bead dispenser capable of applying beads at the specified rate.
- C. Begin pavement marking as soon as practicable after surface has been cleaned and dried.
- D. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F.
- E. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.
- F. Comply with FHWA MUTCD manual (http://mutcd.fhwa.dot.gov) for details not shown.
- G. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.
- H. Apply uniformly painted markings of color(s), lengths, and widths as indicated on drawings true, sharp edges and ends.
 - 1. Apply paint in one coat only.
 - 2. Wet Film Thickness: 0.015 inch, minimum.
 - 3. Length Tolerance: Plus or minus 3 inches.
 - 4. Width Tolerance: Plus or minus 1/8 inch.

- I. Curbs: Paint full vertical face and first 6-inches of horizontal plane at top of curb or combination curb/paving. Provide minimum 2 coats paint.
 - 1. Provide stenciled text in the height, spacing and typeface as indicated on Drawings.
- J. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.
 - 1. Mark the International Symbol of Accessibility at indicated parking spaces.
 - a. Accessibility Logo: Provide minimum of 2 coats paint.
 - 1) Comply with CBC Figure 11B-703.7.2.1.
 - b. Stall Marking:
 - 1) Use single-line style striping between parking stalls, unless otherwise indicated.
 - 2) Comply with local agency regulatory requirements.
 - 3) Accessible Stalls: Comply with ADA Standards and local agency regulatory requirements.
 - (a) Painted lines and markings on pavement shall be minimum 3 inches wide, color as indicated on Drawings
 - (b) Tactile warning lines shall comply with CBC Section 11B-705.1.2.5 Hazardous Vehicular Areas.
 - (c) Tactile warning devices shall comply with CBC, see Section 32 17 26 -Tactile Warning Surfacing.
 - c. Hatching: Provide hatching in parking areas, including accessible parking stalls, as indicated on Contract Drawings or as required by Standard Details. Should Contract Drawings and Standard Details conflict, comply with the more stringent.
 - 2. Hand application by pneumatic spray is acceptable.
- K. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.
- L. Speed Bumps: Provide minimum 2 coats paint on raised portion.
- M. Recreational Areas: Provide minimum 2 coats paint.

3.04 DRYING, PROTECTION, AND REPLACEMENT

- A. Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked.
 - 1. Prevent construction activities over completed markings, except light vehicular and pedestrian traffic.
- B. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings.
- C. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer.
- D. Touch-up paint as required to provide clean, straight lines and full coverage of surfaces.
- E. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities.
- F. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method.

- G. Replace removed markings at no additional cost to District.
 - 1. Clean up all oil, paint splatters and other stains from surfaces in preparation for Substantial Completion review.

3.05 COLOR SCHEDULE

A. Parking and On-Site Roadways

Location	Color	Reflectance**
Driving lane striping	White	82%
Parking space striping	White	82%
Accessibile Parking, ISA, and zone markings	Blue No. 15090 per FED-STD-595C (SAE AMS-STD-595)	52%
Accessible loading and cross-hatching	A. White with Blue perimeter at Asphalt Paving.	82% / 52%
	B. Blue at Concrete Paving*	52%
12 inch high Text: "NO PARKING", "LOADING ZONE", and "FIRE LANE", etc.	White	82%
Firelanes / No Parking zone markings Special Use Markings	Red No. 31350 per FED-STD-595C (SAE AMS-STD-595)	52%
Loading zone markings	Orange Yellow No. 33538 per FED-STD-595C (SAE AMS-STD-595)	52%
Directional arrows	White	82%
Speed Bumps	Orange Yellow No. 33538 per FED-STD-595C (SAE AMS-STD-595)	52%
Black special-use pavement markings, if indicated on Drawings	Black No. 37038 per FED-STD-595C (SAE AMS-STD-595)	NA

*Contrasting color per CBC.

a. See also Division of the State Architect IR 11B-7.

**Daylight directional reflectance (without glass beads) , when tested in accordance with Federal Test Method Standard 141A, Method 612.

B. Electrical Vehicle Charging Station (EVCS):

Location	Color	Reflectance*
EVCS Parking space striping	Yellow No. 33655 per	52%
	FED-STD-595C (SAE	
	AMS-STD-595)	
12 inch high Text:	Yellow No. 33655 per	52%
"EV CHARGING ONLY" CBC 11B-812.9	FED-STD-595C (SAE	
	AMS-STD-595)	

EVCS Accessibile Parking, ISA, and zone markings. CBC Table 11B-228.3.2.1 1-4 EVCS Spaces: Provide space sized for van accessible use. Signage not required. CBC 11B-812.8.1 5-25 EVCS spaces: Provide one van and one standard accessible signage and ISA. >25 EVCS Spaces: Provide at each required accessible space.	Yellow No. 33655 per FED-STD-595C (SAE AMS-STD-595)	52%
Accessible loading and cross-hatching.	Yellow No. 33655 per	52%
	TED-STD-SSSC (SAL	
"EV CHARGING ONLY" CBC 11B-812.8	AMS-STD-595)	
"NO PARKING" CBC Figure 11B-812.9	Do not use blue.	

*Daylight directional reflectance (without glass beads) , when tested in accordance with Federal Test Method Standard 141A, Method 612.

END OF SECTION







ORNAMENTAL METAL PEDESTRIAN GATE - SECTION	1-1/2"=1'-0"	10	4
		\sim	Ĵ

GATE DETAILS REFERENCE NEW DETAILS 9&10/AS-1.0		SEE DETAILS
CAJON HIGH SCHOOL	04-118085	Stamp:
BUILDING 'F' - WOOD SHOP DUST COLLECTOR	DSA File #: 36-H7	CENSED ARCH
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT	Date: 05-12-2020	$= \left(\begin{pmatrix} * & 0 & 7 \\ * & 0 & 7 \\ No. \ C-21340 & * \end{pmatrix} \right)$
	Project #: 1-78-24	- (o, Exp. 10-31-21
3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684 4664 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92010 (760) 438 5899	ASK-1.2	C OF CALIFO



ORNAMENTAL METAL GATE - POST FOOTING 3/8"=1'-0" 26



GATE DETAILS REFERENCE NEW DETAILS 15&26/AS-1.0		SEE DETAILS
CAJON HIGH SCHOOL BUILDING 'F' - WOOD SHOP DUST COLLECTOR 1200 W. HILL DRIVE, SAN BERNARDINO, CA 92407 SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT	DSA APRI #: 04-118085 DSA FILE #: 36-H7 Date: 05-12-2020	Stamp:
S/12/2020 10:54 AM RUHNAUCLARKE.COM 3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684 4664 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92010 (760) 438 5899	1-78-24 Sheet # ASK-1.3	$- \underbrace{\begin{pmatrix} NO, C-2/340 \\ Exp. 10-31-21 \\ F. \\ OF CAL F \\ O$



RAMP DETAIL REFERENCE DETAIL 25/AS-1.1

CAJON HIGH SCHOOL BUILDING 'F' - WOOD SHOP DUST COLLECTOR 1200 W. HILL DRIVE, SAN BERNARDINO, CA 92407 SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT







CONSULTANT



KNA JOB No.: 203.458



ADDENDUM #1

OPENING THRU ROOF DECK (11/S-0.2)

1'-0"

CAJON HIGH SCHOOL WOOD SHOP DUST COLLECTOR 1200 W. HILL DR., SAN BERNARDINO, CA 92407	-	SA APRI #: 00-000000 SA File #: 00-00 2xte:	Stamp: CENSED ARCHING CENSER CLAPSING
SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT		12/18/2020	$\left(\left(* \left(\frac{2}{No. C-21340} \right) * \right) \right)$
RUHNAUCLARKE.COM 3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684 4664 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92010 (760) 438 5899	RUHNAU CLARKE ARCHITECTS	1-78-24 Steet #: SSK-1.1	OF CAL FOR

1'-0"

1'-0"



GENERAL

- 1. THESE STRUCTURAL DRAWINGS AND SPECIFICATIONS, INCLUDING ANY ADDENDA (COLLECTIVELY "THE PLANS") INCORPORATE ALL LEGAL AND INDUSTRY REQUIREMENTS AND STANDARDS INCLUDING WITHOUT LIMITATION THE FOLLOWING:
- THE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 1 (CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE), 2016 EDITION.
- THE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 2 (CALIFORNIA BUILDING CODE), 2016 EDITION.
- OTHER REGULATING AGENCIES WHICH MAY HAVE AUTHORITY OVER ANY PORTION OF THE WORK, INCLUDING THE STATE OF CALIFORNIA DIVISION OF INDUSTRIAL SAFETY, AND THOSE CODES AND STANDARDS LISTED IN THESE NOTES AND SPECIFICATIONS.
- THE FUNCTIONALITY STANDARDS SET FORTH IN TITLE 7 OF THE CALIFORNIA CIVIL CODE (THE \square RIGHT TO REPAIR ACT \square).
- THE MANUFACTURER'S REQUIREMENTS OR RECOMMENDATIONS FOR ANY INCORPORATED PRODUCTS.
- THE MOST CURRENT APPROVED ISSUES OF ANY NOTED SPECIFICATIONS, CODES AND STANDARDS, INCLUDING SUPPLEMENTS, UNLESS NOTED OTHERWISE.
- 2. THE PLANS REPRESENT ONLY THE FINISHED STRUCTURE, AND THEY ARE NOT INTENDED TO INDICATE OR REQUIRE ANY CONSTRUCTION MEANS. METHODS. TECHNIQUES, SEQUENCES OR PROCEDURES. IN PARTICULAR AND WITHOUT LIMITATION. THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR ANY AND ALL EXCAVATION, DEMOLITION, SHORING AND ERECTION PROCEDURES AND FOR ANY AND ALL SAFETY PROGRAMS AND PRECAUTIONS.
- 3. IN USING THE PLANS FOR BIDDING OR CONSTRUCTION PURPOSES, THE CONTRACTOR IS REQUIRED TO REVIEW ALL OF THE PROJECT'S CONSTRUCTION DOCUMENTS AS A WHOLE IN ORDER TO IDENTIFY ALL REQUIREMENTS THAT DIRECTLY OR INDIRECTLY AFFECT ITS PORTION OF THE STRUCTURAL WORK, EVEN REQUIREMENTS LOCATED IN SECTIONS DESIGNATED AS APPLICABLE TO OTHER TRADES. IN CASE OF CONFLICTS, THE CONTRACTOR SHALL EITHER OBTAIN DIRECTION FROM AN APPROPRIATE OWNER REPRESENTATIVE OR OTHERWISE APPLY THE MORE STRINGENT REQUIREMENT.
- 4. IN INTERPRETING THE PLANS. THE FOLLOWING GENERAL RULES APPLY:
- WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DRAWINGS. SPECIFIC NOTES AND DETAILS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
- WORK NOT PARTICULARLY SHOWN OR SPECIFIED SHALL BE THE SAME AS SIMILAR PARTS THAT ARE SHOWN OR SPECIFIED.
- SCALED DIMENSIONS AND GRAPHICALLY SHOWN LOCATIONS ARE TO BE CONSIDERED ONLY APPROXIMATE.
- 5. IN IMPLEMENTING THE PLANS, THE FOLLOWING GENERAL RULES APPLY:
- BECAUSE THE PLANS ARE INTENDED TO SET FORTH THE REQUIREMENTS FOR CONSTRUCTION IN ONLY AN INDUSTRY-STANDARD LEVEL OF QUALITY AND DETAIL, AND THEREFORE ARE INTENDED TO BE SUPPLEMENTED BY APPROPRIATE REQUESTS FOR CLARIFICATION AND INFORMATION, ERRORS AND OMISSIONS ARE TO BE EXPECTED AND ANTICIPATED: AND THE CONTRACTOR IS REQUIRED TO CAREFULLY REVIEW THE PLANS FOR ERRORS AND OMISSIONS AND TO BRING THESE ERRORS AND OMISSIONS TO THE ATTENTION OF AN APPROPRIATE OWNER REPRESENTATIVE IN A TIMELY MANNER AND ASSUMES THE RISK OF THE CONSEQUENCES OF FAILING TO DO SO BEFORE BIDDING OR OTHERWISE PROCEEDING.
- THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS PRIOR TO STARTING CONSTRUCTION, AND NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES OR INCONSISTENCIES.
- SUBMITTALS WILL BE REVIEWED BY THE STRUCTURAL ENGINEER, IF AT ALL, ONLY PURSUANT TO THE INDUSTRY-STANDARD PROTOCOL SET FORTH IN AIA DOCUMENT A201. AND IN NO EVENT WILL THE SUBMITTAL REVIEW PROCESS RELIEVE OR LESSEN THE SUBMITTING CONTRACTOR'S RESPONSIBILITY FOR AN INAPPROPRIATE SUBMITTAL.
- 7. IN NO EVENT WILL ANY SITE VISITS BY THE STRUCTURAL ENGINEER CONCERN CONSTRUCTION MEANS AND METHODS OR CONSTRUCTION SAFETY, AND ALL SUCH MATTERS SHALL REMAIN THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- 8. COPIES OF THE PLANS PROVIDED IN ANY ELECTRONIC FORM ARE SUBJECT TO THE SAME PROVISIONS AS THE OTHER INSTRUMENTS OF SERVICE PREPARED BY OR ON BEHALF OF STRUCTURAL ENGINEER FOR THE PROJECT, INCLUDING WITHOUT LIMITATION THE ENGINEER'S COMMON LAW, STATUTORY OR OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS. A RECIPIENT IS GRANTED AT MOST A TRANSFERABLE NONEXCLUSIVE LICENSE TO REUSE THE PLANS SOLELY FOR PROJECT PURPOSES: AND NO RECIPIENT IS AUTHORIZED TO USE OR TO ALLOW THE USE OF ALL OR ANY PORTION OF THESE PLANS FOR ANY OTHER PURPOSE, AND ANY USE FOR ANY OTHER PURPOSE WOULD CONSTITUTE ACTIONABLE PLAGIARISM. STRUCTURAL ENGINEER PROVIDES DOCUMENTS IN AN ELECTRONIC FORM ONLY IN ITS STANDARD FORMATS AND CONVENTIONS AND WITH NO GUARANTEE OF COMPATIBILITY WITH ANY RECIPIENT'S SOFTWARE OR HARDWARE AND ANY USE WITH OR CONVERSION TO OTHER FORMATS OR CONVENTIONS, OR THE USE WITH ANY PARTICULAR SOFTWARE OR HARDWARE, IS AT THE RECIPIENT'S SOLE RISK.

PROJECT DESIGN CRITERIA

- 1. WIND LOADS
 - RISK CATEGORY: II EXPOSURE CATEGORY: C
 - ULTIMATE DESIGN WIND SPEED (3-SECOND GUST), $V_{ULT} = 125$ MPH NOMINAL DESIGN WIND SPEED, $V_{ASD} = 97$ MPH VELOCITY PRESSURE EXPOSURE COEFFICIENT, $K_z = 0.85$ TOPOGRAPHIC FACTOR, $K_{7t} = 1.0$ WIND DIRECTIONALITY FACTOR, $K_D = 0.85$
- 2. EARTHQUAKE LOADS

CONCRETE

- 1. ALL PORTIONS OF WORK PERTAINING TO CONCRETE CONSTRUCTION SHALL CONFORM TO TITLE 24, PART 2, CHAPTER 19A.
- CONCRETE MIXES SHALL BE DESIGNED BY A QUALIFIED TESTING LABORATORY. MIX DESIGNS SHALL CONFORM TO ACI 318, SEC. 26.4, CBC SEC.1903A AND 1904A. MIX DESIGNS SHALL INCORPORATE THE FOLLOWING CRITERIA:
- MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD OF CONCRETE. MAXIMUM OF 7 SACKS OF CEMENT PER YARD OF CONCRETE.
- MAXIMUM WATER/CEMENT RATIO (BY WEIGHT) OF CONCRETE IN CONTACT WITH SOIL SHALL BE 0.45.
- MAXIMUM SLUMP SHALL NOT EXCEED $3^{\circ} \pm 1^{\circ}$ FOR FOOTINGS, SLABS ON GRADE, AND MASS CONCRETE; AND 4" ± 1" FOR OTHER CONCRETE. SLUMP LIMITATIONS NOTED SHALL APPLY TO CONCRETE MIX PRIOR TO THE ADDITION OF ANY WATER-REDUCING ADMIXTURES OR SUPER-PLASTICIZERS. MAXIMUM SLUMP MAY BE INCREASED TO 5 +/-1" FOR MIX INCLUDING WATER-REDUCING ADMIXTURES OR SUPER-PLASTICIZERS.
- CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CHLORIDE(S) SHALL NOT BE
- 3. SCHEDULE OF STRUCTURAL CONCRETE 28 DAY MINIMUM STRENGTHS AND TYPES: FOOTINGS, CAISSONS, GRADE BEAMS
- 4. PORTLAND CEMENT SHALL CONFORM TO ASTM C-150, TYPE II. CEMENT USED FOR CONCRETE IN CONTACT WITH SOIL SHALL CONFORM TO ASTM C-150, TYPE
- AGGREGATE FOR NORMALWEIGHT CONCRETE SHALL CONFORM TO ASTM C-33. COMBINED AGGREGATE GRADATION OF $\frac{3}{8}$ " MAXIMUM (PEA GRAVEL) SHALL NOT BE USED.
- 6. READY MIXED CONCRETE SHALL CONFORM TO ASTM C-94. 7. PLACEMENT OF CONCRETE SHALL CONFORM TO ACI 304. CLEAN AND ROUGHEN TO
- PLACED. 8. ALL REINFORCING BARS, ANCHOR BOLTS AND OTHER CONCRETE INSERTS SHALL
- BE SECURED IN POSITION PRIOR TO PLACING CONCRETE. 9. PROVIDE SLEEVES FOR PLUMBING AND ELECTRICAL OPENINGS IN CONCRETE BEFORE PLACING. DO NOT CUT ANY REINFORCING WHICH MAY CONFLICT. CORING IN CONCRETE IS NOT PERMITTED EXCEPT AS SHOWN. NOTIFY THE STRUCTURAL ENGINEER, IN ADVANCE, OF CONDITIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS
- 10. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCEMENT:
- CONCRETE EXPOSED TO EARTH OR WEATHER: #6 THROUGH #18 BARS ... #5 BARS, W31 OR D31 WIRE, AND SMALLER CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND: SLABS, WALLS, JOISTS: #14 AND #18 BARS #11 BAR AND SMALLER BEAMS, COLUMNS:
- PRIMARY REINFORCEMENT STIRRUPS, TIES, SPIRALS 11. CONDUITS OR PIPES SHALL NOT BE EMBEDDED WITHIN A SLAB, WALL, BEAM, OR COLUMN, UNLESS SPECIFICALLY DETAILED.
- 12. SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ALL MOLDS, GROOVES,
- 13. NON-SHRINK GROUT WHERE NOTED ON DRAWINGS SHALL BE A PRE-MIXED COMPOUND CONSISTING OF NON-METALLIC AGGREGATE, CEMENT, WATER REDUCING AND PLASTICIZING ADDITIVES, CAPABLE OF DEVELOPING A MINIMUM COMPRESSIVE STRENGTH OF 8,000 PSI AT 28 DAYS. WHERE APPLICATION THICKNESS EXCEEDS MANUFACTURER'S LIMITATIONS, EXTEND WITH $\frac{3}{6}$ " (GRAVEL) AGGREGATE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

REINFORCING STEEL

- 1. ALL PORTIONS OF WORK PERTAINING TO FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL CONFORM TO TITLE 24, PART 2, CHAPTER 19A.
- MAY BE GRADE 40. REINFORCING BARS THAT ARE TO BE WELDED SHALL CONFORM TO ASTM A-706, GRADE 60.
- WELDING OF REINFORCEMENT SHALL BE WITH LOW HYDROGEN ELECTRODES AND SHALL CONFORM TO STRUCTURAL WELDING CODE - REINFORCING STEEL. AWS D1.4, BY THE AMERICAN WELDING SOCIETY AND SEC. 1903A.8. WELDING RODS USED FOR THE WELDING OF REINFORCING SHALL BE E80XX. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS.
- 4. ALL REINFORCING BAR BENDS SHALL BE MADE COLD. ALL #5 OR LARGER REINFORCING BARS SHALL NOT BE RE-BENT.
- 5. FUSION WELDED REINFORCING STEEL ASSEMBLIES SHALL CONFORM TO SEC. 1903A.8. TIES/STIRRUP BARS IN FUSION WELDED ASSEMBLIES SHALL CONFORM TO ASTM A-706, AND LONGITUDINAL HOLDING WIRES SHALL CONFORM TO ASTM A-1064.
- 6. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185, AND SHALL BE LAPPED $1\frac{1}{2}$ SPACES AND 12" MINIMUM.
- 7. DOWELS BETWEEN FOOTINGS AND WALLS OR COLUMNS SHALL BE THE SAME GRADE, SIZE, SPACING AND NUMBER AS THE VERTICAL REINFORCEMENT, RESPECTIVELY.
- 8. REINFORCING SPLICES SHALL BE MADE AS INDICATED ON THE DRAWINGS. 9. ALL VERTICAL REINFORCING SHALL BE CONTINUOUS BETWEEN TWO DIAPHRAGM

LEVELS, UNLESS NOTED OTHERWISE.

PROJECT No.	:1-78-24
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145 PCF, f'c = 3,000 PSI

 λ " AMPLITUDE ALL CONCRETE SURFACES AGAINST WHICH CONCRETE IS TO BE

CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"

REVEALS, ORNAMENTS AND GROUNDS TO BE CAST IN CONCRETE.

REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60. EXCEPT #3 BARS

STRUCTURAL STEEL AND MISCELLANEOUS METAL

- 1. ALL PORTIONS OF WORK PERTAINING TO STRUCTURAL STEEL CONSTRUCTION SHALL CONFORM TO TITLE 24, PART 2, CHAPTER 22A.
- 2. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A-992, UNLESS NOTED OTHERWISE.
- 3. ROUND HOLLOW STRUCTURAL SECTION (HSS) SHALL CONFORM TO ASTM A-500, GRADE
- 4. SQUARE AND RECTANGULAR HOLLOW STRUCTURAL SECTIONS (HSS) SHALL CONFORM TO ASTM A-500, GRADE B.
- 5. CHANNELS, ANGLES AND PLATES SHALL CONFORM TO ASTM A-36, UNLESS NOTED OTHERWISE.
- 6. ALL BOLTS SHALL CONFORM TO THE FOLLOWING. UNLESS NOTED OTHERWISE: • ANCHOR BOLTS: ASTM F1554, GRADE 36
- TYPICAL STEEL CONNECTIONS: ASTM A-325N OR F1852PT (NON-SLIP-CRITICAL) MOMENT AND DRAG CONNECTIONS: ASTM A-325SC OR F1852PT (SLIP-CRITICAL) • MISCELLANEOUS CONNECTIONS NOT NOTED OTHERWISE: ASTM A-307 7. HIGH STRENGTH BOLTS SHALL CONFORM TO THE FOLLOWING, UNLESS NOTED
- OTHERWISE: JOINT ASSEMBLIES USING HIGH-STRENGTH BOLTS SHALL BE IN ACCORDANCE WITH
- SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR F1852PT TWIST OFF TYPE BOLTS, BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION. ALL HIGH STRENGTH BOLTS SHALL CONFORM TO ASTM A325 OR F1852PT TWIST OFF TYPE, NUTS SHALL CONFORM TO ASTM A-563, AND WASHERS SHALL CONFORM
- TO ASTM F-436. PAINT SHALL NOT BE PERMITTED ON CONTACT SURFACES UNLESS NOTED OTHERWISE. CONTACT SURFACES OF BOLTED PARTS SHALL BE DESCALED AND
- FREE OF DIRT, OIL, BURRS, PITS, AND OTHER DEFECTS WHICH PREVENT SOLID SEATING OF PARTS. • ALL HIGH STRENGTH BOLTS SHALL BE TIGHTENED TO THE SNUG TIGHT CONDITION. UNLESS IDENTIFIED ON THE PLANS AS SLIP-CRITICAL.
- SLIP-CRITICAL JOINT ASSEMBLIES SHALL BE FULLY PRE-TENSIONED BY TURN-OF-NUT TIGHTENING, CALIBRATED WRENCH TIGHTENING, INSTALLATION OF ALTERNATE DESIGN BOLTS OR BY DIRECT TENSION INDICATOR TIGHTENING.
- 8. ALL BOLTS CONNECTING STEEL FRAMING MEMBERS SHALL BE FULLY PRETENSIONED AND INSPECTED PER AISC.
- 9. STRUCTURAL STEEL IN SFRS LINES SHALL BE CONNECTED IN SLIP-CRITICAL JOINTS COMPLYING WITH AISC 341-10, SECTION D.2.2.
- 10. ANCHOR BOLTS SHALL BE HEX HEADED. BENT BAR ANCHORS SHALL NOT BE USED.
- 11. STRUCTURAL STEEL SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
- 12. ALL WELDING SHALL CONFORM TO THE STRUCTURAL WELDING CODE STEEL, AWS D1.1 AND SUPPLEMENT AWS D1.8, BY THE AMERICAN WELDING SOCIETY. WELDING RODS SHALL BE E70XX.
- 13. THE FILLER METAL FOR ALL WELDING SHALL HAVE A NOTCH TOUGHNESS OF NOT LESS THAN 20 FT-LBS AT 0 DEGREES F. AS MEASURED BY A STANDARD CHARPY V-NOTCH TEST, ASTM E23, IN ACCORDANCE WITH THE APPLICABLE FILLER METAL SPECIFICATION REFERENCED IN AWS D1.1 AND SEISMIC SUPPLEMENT AWS D1.8.
- 14. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS.
- 15. ALL WELDS NOT SPECIFIED SHALL BE CONTINUOUS FILLET WELDS. SIZE OF WELDS SHALL BE BASED ON AWS D1.1 FOR THICKER PART JOINED. 16. BOLT HOLES SHALL BE $\frac{1}{16}$ " LARGER IN DIAMETER THAN NOMINAL SIZE OF BOLT USED,
- UNLESS NOTED OTHERWISE. BOLT HOLES AT COLUMN BASEPLATES MAY BE 3/6" MAXIMUM LARGER IN DIAMETER THAN NOMINAL SIZE OF ANCHOR BOLT USED, UNLESS NOTED OTHERWISE. 17. DO NOT PAINT STRUCTURAL STEEL SURFACES THAT ARE TO RECEIVE SPRAY-APPLIED
- FIREPROOFING OR TO BE ENCASED IN CONCRETE OR MASONRY.
- 18. ALL STRUCTURAL STEEL AND MISCELLANEOUS METAL ITEMS, INCLUDING CONNECTORS, EXPOSED TO THE WEATHER SHALL BE HOT-DIPPED GALVANIZED, AFTER FABRICATION.
- 19. STRUCTURAL STEEL SHALL BE DELIVERED TO THE JOB SITE FREE OF EXCESSIVE RUST, MILL SCALE, GREASE, ETC.

20. OPENINGS SHALL NOT BE PLACED IN STEEL MEMBERS UNLESS SPECIFICALLY DETAILED.

FOUNDATION

- 1. ALL PORTIONS OF WORK PERTAINING TO EXCAVATIONS, FOUNDATIONS AND RETAINING WALLS SHALL CONFORM TO TITLE 24, PART 2, CHAPTER 18A.
- 2. THE FOUNDATION DESIGN IS BASED ON 2016 CALIFORNIA BUILDING CODE TABLE 1086A.2 PRESUMPTIVE LOAD-BEARING VALUES.
- 3. AN ALLOWABLE SOIL BEARING PRESSURE OF 1500 PSF WAS USED FOR DESIGN. BOTTOM OF FOOTINGS SHALL BE 12" MINIMUM BELOW LOWEST ADJACENT FINAL GRADE AND BEAR ON APPROVED NATURAL GRADE OR COMPACTED FILL. CLASS OF MATERIALS: CLASS 5
- 4. SEE SPECIFICATIONS FOR EARTHWORK OPERATIONS.
- 5. THE CONTRACTOR SHALL PROVIDE FOR DE-WATERING OF EXCAVATIONS FROM EITHER SURFACE WATER, GROUND WATER OR SEEPAGE.
- 6. THE CONTRACTOR SHALL PROVIDE FOR THE DESIGN, APPROVALS, PERMITS, INSTALLATION AND MONITORING OF ALL CRIBBING, SHEATHING AND SHORING REQUIRED TO SAFELY RETAIN TEMPORARY EXCAVATIONS.
- 7. EXCAVATIONS FOR FOOTINGS SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACING CONCRETE AND REINFORCING. THE CONTRACTOR SHALL NOTIFY THE GEOTECHNICAL ENGINEER WHEN EXCAVATIONS ARE READY FOR INSPECTION. THE GEOTECHNICAL ENGINEER SHALL SUBMIT A LETTER OF COMPLIANCE TO THE OWNER.
- 8. ALL EXCAVATIONS SHALL BE PROPERLY BACKFILLED. DO NOT PLACE BACKFILL BEHIND RETAINING WALLS BEFORE CONCRETE HAS ATTAINED FULL DESIGN STRENGTH. THE CONTRACTOR SHALL BRACE OR PROTECT ALL BUILDING AND PIT WALLS BELOW GRADE FROM LATERAL LOADS UNTIL ATTACHING FLOORS ARE COMPLETELY IN PLACE AND HAVE ATTAINED FULL DESIGN STRENGTH. THE CONTRACTOR SHALL PROVIDE FOR DESIGN, PERMITS AND INSTALLATION AND REMOVAL OF SUCH BRACING.
- 9. FOOTING BACKFILL AND UTILITY TRENCH BACKFILL WITHIN BUILDING AREA SHALL BE MECHANICALLY COMPACTED IN LAYERS, TO THE APPROVAL OF THE GEOTECHNICAL ENGINEER. FLOODING WILL NOT BE PERMITTED.
- 10. ALL ABANDONED FOOTINGS, UTILITIES, ETC., THAT INTERFERE WITH NEW CONSTRUCTION, SHALL BE REMOVED.

FRAMING

11. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT SHOULD ANY BURIED STRUCTURES, SUCH AS CESSPOOLS, CISTERNS, FOUNDATIONS, ETC., BE FOUND.

COLD-FORMED STEEL FRAMING

- ALL PORTIONS OF WORK PERTAINING TO COLD-FORMED STEEL CONSTRUCTION SHALL CONFORM TO TITLE 24, PART 2, CHAPTER 22A.
- . ALL LIGHT GAUGE METAL FRAMING SHALL BE GALVANIZED AND SHALL CONFORM TO ASTM A-653 SS, GRADE 50, CLASS 1. WITH A MINIMUM YIELD STRENGTH OF 50 KSI FOR 16 GAUGE AND HEAVIER FRAMING, AND ASTM A-653 SS, GRADE 33, WITH A MINIMUM YIELD STRENGTH OF 33 KSI FOR 18 GAUGE AND LIGHTER
- DIMENSIONS, PROPERTIES AND TYPES NOTED ARE BASED ON METAL STUDS AND TRACKS BY STEEL STUD MANUFACTURERS ASSOCIATION, ICC NO. ESR-3064P,
- UNLESS NOTED OTHERWISE. ALL STUDS AT JAMBS OF DOOR AND WINDOW OPENINGS SHALL BE 16 GAUGE.
- UNLESS NOTED OTHERWISE. WELDING SHALL BE IN ACCORDANCE WITH THE STRUCTURAL WELDING CODE -
- SHEET STEEL, AWS D1.3, BY THE AMERICAN WELDING SOCIETY. . ALL SHEET METAL SCREWS SHALL PROTRUDE 3 EXPOSED THREADS MINIMUM
- THROUGH BASE METAL FRAMING. 7. ALL METAL STUDS SHALL HAVE STIFFENED FLANGES.
- 8. SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR SIZE AND GAUGE OF STUDS.

- COMPANY INC., OR DEWALT, UNO.

- PURPOSE.
- PROJECT INSPECTOR. 5. TEST QUANTITY OF POST-INSTALLED ANCHORS AS NOTED BELOW:
- **APPLICATION**

SILL PLATES STRUCTURAL NON-STRUCTURAL (EQUIP. ANCHORAGE, ETC.)

- RESUME INITIAL TESTING FREQUENCY.
- SPRING LOADING DEVICE.
- POST-INSTALLED ANCHORS:

8. TEST LOADS (1)(2)(3)

TORQUE TEST VALUES – EXPANSION ANCHORS NORMAL WEIGHT CONCRETE			
ANCHOR DIAMETER (INCH)	ANCHOR DEPTH (INCHES)	TORQUE (FT–LBF)	
3%8	2	25	
1/2	2	40	
	31⁄4	40	
5,	31/8	60	
78	4	60	
3⁄4	33⁄4	110	
	43/4	110	

)	TEST HILTI,	VALUES INC. (I	AR CC
)	TEST	VALUES	AR

``		
(3)	VERIFY (ICC ES	TORQUE SR-3037)

TORQUE
ANCHOR DIAMET (INCH)
3%8
1/2
5%
3⁄4

U

(2) TEST VALUES ARE BASED ON CARBON STEEL ANCHORS.

TORQI
ANCHOR DIAMETI (INCH)
3%8
4.

5⁄8	
3⁄4	

(3) VERIFY TORQUE VALUES WITH MANUFACTURER FOR HILTI KWIK HUS-EZ SCREW ANCHORS (ICC ESR-3027) OR DEWALT SCREW-BOLT+SCREW ANCHOR (ICC ESR-3889)

6¾

RU	N	A	U

3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684 4664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92010 (760) 438 5899

POST-INSTALLED ANCHORS

1. ACCEPTABLE EQUIVALENT MANUFACTURERS OF POST-INSTALLED EXPANSION ANCHORS AND SCREW ANCHORS SHALL BE HILTI INC., SIMPSON STRONG-TIE

. TESTS FOR POST-INSTALLED ANCHORS IN HARDENED CONCRETE SHALL CONFORM TO TITLE 24, PART 2, CHAPTER 19A, SECTION 1910A.5.

3. POST-INSTALLED ANCHOR INSTALLATION SHALL BE INSPECTED BY A SPECIAL INSPECTOR SPECIFICALLY APPROVED BY THE ENFORCEMENT AGENCY FOR THAT

4. POST-INSTALLED ANCHOR TESTING SHALL BE DONE IN THE PRESENCE OF THE

<u>QUANTITY</u>

10% OF BOLTS 100% OF BOLTS 50% OF BOLTS

6. IF ANY ANCHOR FAILS TESTING, TEST ALL ANCHORS OF THE SAME CATEGORY NOT PREVIOUSLY TESTED UNTIL TWENTY (20) CONSECUTIVE ANCHORS PASS, THEN

TORQUE TESTING SHALL BE APPLIED BY CALIBRATED WRENCH. TENSION TESTING (WHERE INDICATED) SHALL BE APPLIED BY HYDRAULIC JACK OR CALIBRATED

8. THE FOLLOWING CRITERIA SHALL APPLY FOR THE ACCEPTANCE OF INSTALLED

A. TORQUE WRENCH METHOD: THE APPLICABLE TEST TORQUE MUST BE ATTAINED WITHIN ONE-HALF (%) TURN OF THE NUT. SLEEVE ANCHORS $\frac{3}{4}$ INCH DIAMETER OR LESS MUST ATTAIN THE SPECIFIED TEST TORQUE WITHIN ONE-QUARTER ($\frac{1}{4}$) TURN OF THE NUT, AND THREADED ANCHORS MUST ATTAIN THE SPECIFIED TEST TORQUE WITHIN ONE-QUARTER ($\frac{1}{2}$) TURN OF THE SCREW AFTER INITIAL SEATING OF THE SCREW HEAD.

B. HYDRAULIC RAM METHOD: (FOR TENSION TESTING WHERE INDICATED) ANCHORS SHALL MAINTAIN THE TENSION TEST LOAD FOR A MINIMUM OF 15 SECONDS AND SHALL EXHIBIT NO DISCERNABLE MOVEMENT DURING THE TENSION TEST. (AN EXAMPLE OF DISCERNABLE MOVEMENT WOULD BE LOOSENING OF THE WASHER UNDER THE NUT).

TEST \	VALUES -	EXPANSION	ANCHORS

RE BASED ON KWIK BOLT TZ (KB-TZ) EXPANSION ANCHORS BY EVALUATION REPORT NUMBER ESR-1917). (2) TEST VALUES ARE BASED ON CARBON STEEL ANCHORS.

> VALUES WITH MANUFACTURER FOR SIMPSON STRONG-BOLT 2 OR DEWALT POWER-STUD+SD2 (ICC ESR-2502)

TEST VALUES –	EXPANSION	ANCHORS
GROUT-FILL		

ER	ANCHOR DEPTH (INCHES)	TORQUE (FT–LBF)
	2	15
	2	25
	31⁄4	25
	31/8	35
	4	35
	33⁄4	70
	43⁄4	70

JES ARE BASED ON KWIK BOLT TZ (KB–TZ) EXPANSION ANCHORS BY (ICC EVALUATION REPORT NUMBER ESR-3785).

(3) VERIFY TORQUE VALUES WITH MANUFACTURER FOR SIMPSON WEDGE-ALL (ICC ESR-1396) OR DEWALT POWER-STUD+SD1 (ICC ESR-2966)

UE T NC	EST VALUES – SCREW DRMAL WEIGHT CONCRE	ANCHORS TE
ſER	ANCHOR DEPTH (INCHES)	TORQUE (FT–LBF)
	2¾	50
	31/2	50
	33⁄4	65
	4½	65
	4½	100
	6	100
	6	150

(1) TEST VALUES ARE BASED ON TITEN HD SCREW ANCHORS BY SIMPSON STRONG-TIE. (ICC EVALUATION REPORT NUMBER ESR-2713).

150

Tel (949) 462-3200, Fax (949) 462-3201

KNA JOB NO: 203,458

\sim		
A	NCHORS AND/OR DOWELS INSTALLED WITH ADHESIVE	1
1.	ANCHORS AND/OR DOWELS SHALL BE INSTALLED WITH ADHESIVE ONLY WHERE INDICATED ON DRAWINGS.	
2.	ANCHORS AND/OR DOWELS SHALL BE INSTALLED IN CONCRETE USING ONE OF THE FOLLOWING PRODUCTS IN ACCORDANCE WITH THE APPLICABLE ICC/IAPMO REPORT:	
	 HILTI HIT-HY 200 ADHESIVE SIMPSON SET-XP ADHESIVE DEWALT PURE110+ ADHESIVE ICC NO. ESR-3298 	
3.	ANCHORS AND/OR DOWELS SHALL BE INSTALLED IN GROUTED MASONRY USING ONE OF THE FOLLOWING PRODUCTS IN ACCORDANCE WITH THE APPLICABLE ICC REPORT:	
	 HILTI HIT-HY 200 ADHESIVE SIMPSON SET-XP ADHESIVE ICC NO. ESR-3963 IAPMO NO. ER-265 	
4.	ADHESIVE SYSTEMS OTHER THAN THOSE SPECIFIED SHALL BE SUBMITTED AS A SUBSTITUTION, AND ARE SUBJECT TO THE REVIEW AND APPROVAL OF THE ENFORCEMENT AGENCY, THE ARCHITECT, AND THE STRUCTURAL ENGINEER.	
5.	HOLES SHALL BE DRILLED WITH NON-REBAR-CUTTING DRILL BITS.	
6.	HOLES SHALL BE CLEAN OF CONCRETE DUST AND DEBRIS USING A STEEL WIRE BRUSH AND OIL—FREE COMPRESSED AIR. HOLES SHALL ALSO BE FREE OF STANDING WATER.	
7.	PROJECT INSPECTOR SHALL VERIFY INSTALLATION OF ANCHORS OR DOWELS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, INCLUDING CLEANLINESS OF DRILL HOLES AND PROPER EMBEDMENT.	

- 8. ANCHORS SET IN CONCRETE AND GROUTED MASONRY SHALL BE TESTED TO 2 TIMES THE ASD ALLOWABLE TENSION LOAD, 1.25 TIMES THE LRFD STRENGTH CAPACITY. OR 80% OF THE YIELD STRENGTH OF THE BOLT FOR THE SPECIFIC LOCATION OF THE ANCHOR TO BE TESTED, WHICHEVER IS LESS. TORQUE TESTING IS NOT PERMITTED. SEE DETAILS FOR TEST LOADS.
- 9. ADHESIVE ANCHORS INSTALLED IN HORIZONTAL TO VERTICALLY OVERHEAD ORIENTATION TO SUPPORT SUSTAINED TENSION LOADS SHALL BE DONE BY A CERTIFIED ADHESIVE ANCHOR INSTALLER (AAI) AS CERTIFIED THROUGH ACI/CRSI (ACI 318-14 17.8.2.2). PROOF OF CURENT CERTIFICATION SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF INSTALLATION. 10. ADHESIVE ANCHORS MUST BE INSTALLED IN CONCRETE AGED A MINIMUM OF 21

GENCY APPROVAL e No: 00-00 A#00-0000

AGENCY APPROVAL File No: ##### A###-#

RUHNAU C L A R K E ARCHITECTS

1-78-24
MOUNTING : <u>SURFACE</u> A.I.C. RATING : <u>10,000</u>	EXISTING PANEL 5SS 208 / 120 VOLTS, 3 PHASE, 4 WIRE
	Volt-Amps Ltg Rec Misc Wire Len VD Ckt Ckt A B C Ckt VD Len Wire Ø AN Ø BN Ø CN Ltg Rec Misc (ft) % Brk No A B C Ckt VD Len Wire
RECEPTACLES CONTROL CIRCUIT CONTROL CIRCUIT	1000 #12 Cu - 20/1 1 - 2 20/1 - #12 Cu 180 #12 Cu - 20/1 3 - 4 20/1 - #12 Cu 180 #12 Cu - 20/1 5 - 6 20/1 - #12 Cu
UNIT VENT. FAN	180 #12 Cu - 20/1 0 20/1 - #12 Cu 520 #12 Cu - 20/1 7 8 15/1 - #12 Cu 260 #12 Cu - 15/1 9 10 20/1 - #12 Cu
1/3 HP EXH FAN 1/3 HP EXH FAN	864 #12 Cu - 20/1 11 + 12 15/1 - #12 Cu 864 #12 Cu - 20/1 13 + 14 20/1 - #12 Cu
UNIT VENT FAN UNIT VENT FAN	520 #12 Cu - 20/1 15 - #12 Cu 520 #12 Cu - 20/1 17 - #12 Cu - #12 Cu
SPARE SPARE	
SPARE SPACE	- 20/1 23 - 4 20/1 - #12 Cu - 25 + 26 -
SPACESPACE	28 28 29 30 20/1 #12 Cu
PANEL CALCULATION	
CONNECTED LOAD	CONNECTED BALANCED LINE CURRENT = 40.5 A LIGHTING LOAD @ 125%: - VA OTHER LCL @ 125%: - VA CONNECTED RECEPTACLE LOAD: - VA
DEMAND LOAD	FIRST 10,000 VA @ 100%: - VA REMAINDER @ 50%: - VA CONNECTED KITC. LOAD @ Q'TY: - VA KITC. LOAD @ DEMAND FACTOR: - VA OTHER NON LCL LOAD @ 100%: - VA LARGEST MOTOR @ 25%: - VA
OTES: EXISTING LOAD/CONDITION TO REMAIN UNC NEW LOAD, PROIVDE NEW CIRCUIT BREAKE	DEMAND LOAD: 4,664 VA DEMAND BALANCED LINE CURRENT = 40.5 A HANGED R SAME TYPE CHARATERISTIC AND AIC RATING AS EXISTING
MOUNTING : FLUSH	PANEL 2SS(SECT 1)
A.I.C. RATING : <u>35K MIN</u>	Volt-Amps
	Ø AN Ø BN Ø CN Ltg Rec Misc Size (ft) % Brk No A B C No Brk % (ft) Size 1000
EXISTING LOAD	
	1000 - 20/1 5 - 6 20/1 - 1000 - 20/1 7 - 8 20/1 -
EXISTING LOAD	- 20/1 9 + 10 20/1 - 1000 - 20/1 11 - 12 20/1 -
EXISTING LOAD	Image: 1000 - 20/1 13 + 14 20/1 - 1000 - 20/1 15 + 16 20/1 -
EXISTING LOAD EXISTING LOAD	1000 - 20/1 17 - 18 20/1 - 1000 - 20/1 19 - 20 20/1 -
EXISTING LOAD EXISTING LOAD	1000 - 20/1 21 - 22 20/1 - 1000 - 20/1 23 - 24 20/1 -
SPARE SPARE	1000 - 20/1 25 - 26 20/1 - 1000 - 20/1 27 - 28 20/1 - #12 C
SPARE SPACE	1000 - 20/1 29 - 30 20/1 - #12 C
SPACE SPACE	
SPACE SPACE	
SPACE	
PANEL CALCULATION	Ø AN CONNECTED LOAD ⁻ 9 800 V/A
CONNECTED LOAD	CONNECTED BALANCED LINE CURRENT = 81.5 A
	LIGHTING LOAD @ 125%: - VA
	CONNECTED RECEPTACLE LOAD: - VA
	FIRST 10,000 VA @ 100%: - VA REMAINDER @ 50%: - VA
DEMAND LOAD	CONNECTED KITC. LOAD @ Q'TY: - VA
	KITC. LOAD @ DEMAND FACTOR: - VA OTHER NON LCL LOAD @ 100%: - VA
	LARGEST MOTOR @ 25%: - VA DEMAND LOAD: 9.800 VA
	DEMAND BALANCED LINE CURRENT = 81.5 A
	OF SECTIONS 1 AND 2
	TO MAIN
	480/277V, 3ø, 4W

 REVISION No.
 DATE
 DESCRIPTION

 REVISION No.
 DATE
 DESCRIPTION

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 DATE
 DESCRIPTION

PROJECT No. : 1-78-24

ISSUE No.___ ISSUE No.___ ISSUE No.___ ISSUE No.___

CHECKED BY: ____ DESCRIPTION____ ___ DESCRIPTION____ ____ DESCRIPTION___ __ DATE____ __ DATE____ __ DATE____ __ DATE____

-											7		
					MAIN	MLO							MOUNTING : FLUSH
					BUS:	225A						A	I.C. RATING : 14.000
													<u></u>
			/olt-Amn	\$						ш	-		
Rec	Ltg	ØAN	ØBN	ØCN	-	DE	SCRIPTION			VOT		LO	DESC
		180			CONTROL CI	RCUIT				1	-	2	EXIST LIGHTS - AUTO SHO
					SPARE					1	-	1	EXIST LIGHTS - AUTO SHO
				528	1/6 HP PUMP					1	1	1	EXIST. LIGHTS - AUTO SHO
		696			1/4 HP FAN					1	1	1	SPARE
			1400		UNIT VENT F	AN				1	1	1	SPARE
				864	1/4 HP FAN					1	1	1	SPARE
		540			FLUSH VALVE	ES				1	1	1	EXIST. UNIT HEATER - ELE
			600		RM F7 RECEI	PTACLES				1	1	1	EXIST. UNIT HEATER MET
				400	RM F7 RECEI	PTACLES				1		1	EXIST. UNIT HEATER MET
		864			SPARE					1	1	1	SPARE
			1200		HAND DRYEF	र				1	1		SPARE
				1200	HAND DRYEF	र				1	1	1	SPARE
					SPACE					1		÷	
					SPACE	~~~~~	~~~~~	\sim	\sim			1	EXIST. EXST. FAN PAINT B
				600	DOOR ENTRY	SYSTEM - V	NOOD SHOP			1	17	1	
		ØBN	h	\cdots	- ACN	un	·····	\sim	\cdots	\dots			
		4,760	VA		5,156	VA	14,	580	VA			3	EXIST WATER HEATER
					HIG	H LINE CUI	RRENT (ØC)	= 43	Α				
		-	VA		-	VA	. ,	_	VA		-	1	SPACE
		_	\/Δ		_			_	VΔ			1	SPACE
									VA		-	1	SPACE
		-	VA		-	VA		-	VA				PANEL CA
		-	VA		-	VA		-	VA				
		-	VA		-	VA		-	VA		-		CONNEC
		-	VA		-	VA		-	VA			\vdash	
		-	VA		-	VA		-	VA				
		-	VA		-	VA		-	VA				
		-	VA		-	VA		-	VA				
		4,760	VA		5,156	VA	14,	580	VA				
					HIG	H LINE CUI	RRENT (ØC)	= 43	Α				
											4		DEMAN

	N N	Volt-Amps										
DESCRIPTION	ØAN	ØBN	ØCN			IVIISC	Siz					
1 EXIST. LIGHTS - AUTO SHOP	3600											
1 EXIST. LIGHTS - AUTO SHOP		3400										
1 EXIST. LIGHTS - AUTO SHOP			3800									
1 SPARE												
1 SPARE												
1 SPARE												
1 EXIST. UNIT HEATER - ELECTRONICS	4000											
1 EXIST. UNIT HEATER METAL		8000										
1 EXIST. UNIT HEATER METAL			8000									
1 SPARE												
1 SPARE												
1 SPARE												
	300											
1 EXIST. EXST. FAN PAINT BOOTH		300										
			300]								
3 EXIST WATER HEATER												
				1								
1 SPACE												
1 SPACE												
1 SPACE												
PANEL CALCULATION												
					CO	NNEC	TEL					
CONNECTED LOAD							C					
		LIGHTING LOAD										
		OTHER LCL										
		CONNECTED RECEPTACI										
		FIRST 10,000 VA (
		REMAINDER										
DEMAND LOAD		CONNECTED KITC. LOAD										
		KITC. LOAD @ DEMAND F										
		OTHER NON LCL LOAD (
		LARGEST MOTOR										
						DEM	AND					

1 EXISTING LOAD/CONDITION TO REMAIN UNCHANGED 2 NEW LOAD, PROVIDE NEW CIRCUIT BREAKER AS INDICATED, SAME TYPE, VOLTAGE AND CHA **3 EXISTING LOAD NOT IN USE**

MOUNTING : FLUSH

A.I.C. RATING : 35K MIN

~	Lta	١	/olt-Amp	s	DESCRIPTION							
C	Lig	Ø AN	Ø BN	ØCN			DESCRIPTI	UN		(
		1000			EXISTING LO	DAD						
_			1000		EXISTING LO	DAD						
_				1000	EXISTING LO							
_		1000	4000		EXISTING L							
_			1000	1000								
+		1000		1000								
+		1000	1000									
+			1000	1000								
+		900		1000	EXISTING							
+			900		EXISTING							
				900	SPARE	0,12						
		900			SPARE							
			864		AIR FILTER							
				864	AIR FILTER							
					SPACE							
					SPACE							
					SPACE							
					SPACE							
		<u></u>			SPACE							
					SPACE							
		ØBN			ØC	N						
		9,764	VA		9,764	4 VA		29,328	VA			
					HIGH	I LINE C	URRENT (Ø	A) = 81.7	Α			
		-	VA		-	VA		-	VA			
		-	VA		-	VA		-	VA			
		-	VA		-	VA		-	VA			
		-	VA		-	VA		-	VA			
		-	VA		-	VA		-	VA			
		-	VA		-	VA		-	VA			
		-	VA		-	VA		-	VA			
		-	VA		-	VA		-	VA			
		-	VA		-	VA		_	VA			
		9.764	VA		9.764	1 VA		29.328	VA			
		-1			HIGH		URRENT (Ø	$(\Delta) = 81.7$	Δ			
					The				^			
								1				
								/				

MAIN: 300A

벁	DESCRIPTION	١	/olt-Amp	S	Lta	Doo	Mico				
2	DESCRIPTION	ØAN	ØBN	ØCN	Lig	Rec	IVIISC				
	MITER SAW	1176						#			
	MITER SAW		1176					#			
	DRILL PRESS			1176				#			
	DRILL PRESS	1176						#			
	EDGE SANDER		1800					#			
	SPARE			1000							
	BAND SAW	1800						#			
	BAND SAW		1800					#			
	DESK SHOP BOT 120V			1000				#			
	SPACE										
	SPACE										
	SCROLL SAW			1176				#			
	SPARE	900									
	SPARE		900								
	SPARE			900							
	SPARE	900									
	SPARE		900								
	SPARE			900							
	SPACE										
	SPACE										
	SPACE										
	PANEL CALCULATION										
	CONNECTED LOAD	CONNECT									
					LIC	GHTIN	G LO	4			
		OTHER LC									
		CONNECTED RECEPTAG									
		FIRST 10 000 V									
		REMAINDE									
	DEMAND LOAD	CONNECTED KITC. LOA									
		KITC. LOAD @ DEMANE									
		OTHER NON LCL LOA									
		LARGEST MOTO									
		DEMA									
NC)TE:	I						_			

1 PROVIDE 200A 3 POLE RATED CONTACTOR MECHAICALLY HELD WITH 120V COIL CONNECTED TO DUST COLLECTOR ON/OFF CONTROL CIRCUIT CONTACTOR MOUNTED IN SEPARATE COMPARTMENT ABOVE PANEL, AND SHALL ENERGIZE PANEL SECTION 2 ONLY UPON ACTIVATION OF DUST COLLECTION SYSTEM.



3775 TENTH STREET, RIVERSIDE CALIFORNIA 92501 (951) 684 4664 / 5751 PALMER WAY, SUITE C, CARLSBAD CALIFORNIA 92010 (760) 438 5899

								DEMAND BALANCE	D LINE CURRENT = 161.7 A		HIGH LINE CURREI	NT (ØB) = 169.2 A
								DEMAND LOAD:	42,850 VA	46,900 VA	44,700 VA	134,450 VA
	R SAME TYPE CHARATERISTIC AND AIC RATING AS EXIS	TING					LARG	EST MOTOR @ 25%:	- VA - VA	- VA - VA	- VA - VA	- VA - VA
ON TO REMAIN UNCH	IANGED						KIIC. LOAD (- VA - V/A	- VA	- VA	- VA
						DEMAND LOAD	CONNECTED	KIIC. LOAD @ Q'TY:	- VA	- VA	- VA	- VA
	DEMA	ND BALANCED LINE CURRENT = 40.5 A		HIGH LINE CURREI	NT (ØC) = 43 A			REMAINDER @ 50%:	- VA	- VA	- VA	- VA
	DEMAND LOAI	D: 4,664 VA	4,760 VA	5,156 VA	14,580 VA		FIRST	T 10,000 VA @ 100%:	- VA	- VA	- VA	- VA
	LARGEST MOTOR @ 259	- VA	- VA	- VA - VA			CONNECTED	RECEPTACLE LOAD:	- VA	- VA	- VA	- VA
	OTHER NON LCL LOAD @ 1009	6: - VA	- VA	- VA	- VA		(OTHER LCL @ 125%:	- VA	- VA	- VA	- VA
	KITC. LOAD @ DEMAND FACTOR	R: - VA	- VA	- VA	- VA		LIGH	HING LOAD @ 125%:	- VA	- VA	- VA	- VA
D LOAD	CONNECTED KITC. LOAD @ Q'T	Υ: - VA	- VA	- VA	- VA				ED LINE CURRENT = 161.7 A		HIGH LINE CURREI	NT (ØB) = 169.2 A
	REMAINDER @ 509	6: - VA	- VA	- VA	- VA	CONNECTED LOAD		CONNECTED LOAD:	42,850 VA	46,900 VA	44,700 VA	134,450 VA
	FIRST 10,000 VA @ 1009	6: - VA	- VA	- VA	- VA	PANEL CALCULATION			Ø AN	Ø RN	ØCN	
	CONNECTED RECEPTACLE LOAI	D: - VA	- VA	- VA	- VA							
	OTHER LCL @ 1259	6: - VA	- VA	- VA	- VA						SPACE	
	LIGHTING LOAD @ 1259	ώ: - VA	- VA	- VA	- VA						SPACE	
	CONNE	CTED BALANCED LINE CURRENT = 40.5 A		HIGH LINE CURREI	NT (ØC) = 43 A			3	35 36 3	3100)	
	CONNECTED LOAI	D: 4,664 VA	4,760 VA	5,156 VA	14,580 VA	3 EXIST WATER HEATER			33 + + 34 / -	3100	EXIST AIR COMPRESSOR	
		ØAN	ØBN	mach			300	40 /		3100		
		- 29 - 4 30 20/1 - #12 Cu 2	600	DOOR ENTRY SYSTEM - WOOI	D SHOP		300		$\frac{27}{29}$ $\frac{28}{30}$ $\frac{3}{3}$ $\frac{7}{3}$	18000	0	
				SPACE			300	15		18000		
		- 20/1 23 24 20/1 - #12 Cu			1	1 SPARE		- 20/1		40000		
		- 20/1 21 + 22 20/1 - #12 Cu 2	1200		1	1 SPARE		- 20/1			SPARE	
			864	SPARE	1	1 SPARE		- 20/1	19 + 20 100/			
	520 #12 Cu	- 20/1 17 + 18 20/1 - #12 Cu 1	400	RM F7 RECEPTACLES	1	1 EXIST. UNIT HEATER METAL	8000	- 40/1	17 18 20/1 -	4000	EXIST UNIT HEATER - ELE	ECTRONICS
	520 #12 Cu	- 20/1 15 - 16 20/1 - #12 Cu	600	RM F7 RECEPTACLES	1	1 EXIST. UNIT HEATER METAL	8000	- 40/1		8000	EXIST UNIT HEATER - WO	OD SHOP
	864 #12 Cu	- 20/1 13 + 14 20/1 - #12 Cu	540	FLUSH VALVES	1	1 EXIST. UNIT HEATER - ELECTRONICS	4000	- 40/1		8000	EXIST UNIT HEATER - WO	OD SHOP
	864 #12 Cu	- 20/1 11 + 12 15/1 - #12 Cu	864	1/4 HP FAN		1 SPARE		- 40/1	9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3000		
	220 #12 Cu	- 20/1 / 8 15/1 - #12 Cu	b9b 1400		1			- 40/1		2850	EXIST. LIGHTS - WOOD SH	HOP
	180 #12 Cu	- 20/1 5 6 20/1 - #12 Cu	528			1 EXIST. LIGHTS - AUTO SHOP	3800	- 20/1	5 6 20/1 -	4050) EXIST. LIGHTS - AUTO SH	OP
	180 #12 Cu	- 20/1 3 4 20/1 -		SPARE	1	1 EXIST. LIGHTS - AUTO SHOP	3400	- 20/1	3 4 20/1 -	3100	EXIST. LIGHTS - BOYS R/F	2
	1000 #12 Cu	- 20/1 1 + 2 20/1 - #12 Cu	180	CONTROL CIRCUIT	1	1 EXIST. LIGHTS - AUTO SHOP	3600	- 20/1		3000	EXIST. LIGHTS - AUTO SH	OP
CRIPTION	Volt-Amps Ø AN Ø BN Ø CN Ltg Rec Misc Wire Le Size (ft	n VD Ckt Ckt A B C Ckt Ckt VD Len Wire Misc Red	Ltg Volt-Amps	DESCR	PTION		Volt-Amps ØANØBNØCN Ltg	Misc Wire Len VD Ckt	Ckt A B C Ckt Ckt VD Len Wire Misc	Ltg Volt-Amps	DES	CRIPTION
		2087120 VOLTS, 3 PHASE, 4 WIRE		BOS: <u>225A</u>		A.I.C. RATING : <u>14,000</u>		4807277	VOLTS, 3 PHASE, 4 WIRE		BUS: 225A	_
									171122 20(2)			_

MAIN: 300A PANEL 2SS(SECT 2) NOTE 1 BUS: _____400A 208 / 120 VOLTS, 3 PHASE, 4 WIRE Wire Len VD Ckt Ckt ABC Ckt Ckt VD Len Wire Volt-Amps Misc Rec Ltg DESCRIPTION ØAN ØBN ØCN No Brk 903 903 #12 Cu TABLE SAW

 903
 TABLE SAW

 903
 903

 903
 TABLE SAW

 903
 TABLE SAW

 903
 JOINTER

 1373
 JOINTER

 1373
 JOINTER

 1373
 SHAPER

 1373
 SHOP BOT (120V)

 903
 903

 903
 DRUM SANDER

 20/1 51 + 52 #12 Cu 20/1 53 54 #12 Cu #12 Cu #12 Cu 20/1 55 + 56 20 20/1 57 58 20/1 59 60 20 #12 Cu ______#12 Cu ______#12 Cu 61 62 / 63 64 20/1 20/1 65 66 20 / #12 Cu 20/1 67 68 20/1 69 70 / 903 DRUM SANDER #12 Cu 20/1 71 + 72 20 903 3700 20/1 73 + 74 20/1 75 + 76 40 / 3700 PLANNER 20/1 77 + 78 / #8 Cu 79 + 80 / _____
 81
 82

 83
 84
 SPACE -SPACE ØAN ØCN ØBN TED LOAD: 16,010 VA 15,358 VA 14,837 VA 46,205 VA CONNECTED BALANCED LINE CURRENT = 128.3 A HIGH LINE CURRENT (ØA) = 133.4 A D @ 125%: - VA - VA - VA - VA L @ 125%: - VA - VA - VA VA CLE LOAD: - VA - VA - VA - VA /A @ 100%: - VA - VA - VA - VA ER @ 50%: - VA - VA - VA - \/A AD @ Q'TY: - VA - VA - VA - VA D FACTOR: - VA - VA - VA VA D @ 100%: - VA - VA - VA - VA OR @ 25%: - VA - VA - VA VA 46,205 VA 16,010 VA 15,358 VA AND LOAD: 14,837 VA DEMAND BALANCED LINE CURRENT = 128.3 A HIGH LINE CURRENT (ØA) = 133.4 A

)150A (E)TRANSFORMER "P–1GG" 750KVA 4160–208/120V, 3ø, 4W		
 150AT 3P		
 PANEL 5SS		



CAJON HIGH SCHOOL WOOD SHOP DUST COLLECTOR PANEL SCHEDULE 1200 W. Hill Dr., San Bernardino, CA 92407 San Bernardino City Unified School District



<u>ENGINEERS, INC.</u> ch Drive 92618 ıx (949) 753–1992 nbengrs.com **#18192**

AGENCY APPROVAL File No: ##### A###-######

RUHNAU C L A R K E ARCHITECTS

E0.3

1-78-24

