HMC DESIGN FOR GOOD Architects

January 30, 2026

HMC Architects Project No. 3431 010100
DSA File and Application No. 39-50 / 02-123780
PTN: 68585-296

ADDENDUM NO. 1

Samuel M. Gantner Elementary School – Site Work
Lodi, California

HMC Architects

1. ALL WORKMANSHIP, MATERIALS, APPLIANCES AND EQUIPMENT which may be included in the following items shall be the same relative quantity as described for similar work set forth in the original or main specifications of which these Addendum items shall be considered a part.

2. ADDENDUM SECTIONS (included with this Addendum)

   The following modify or supplement the issued bid documents. NONE

3. ADDENDUM DRAWINGS (included with this Addendum)

   The following modify or supplement the issued bid documents.

   REPLACE all drawing sheets.

4. PROJECT MANUAL

   NONE

5. DRAWINGS

A. DELETE Design Development drawings in their entirety and ADD DSA Submittal Documents in their entirety as included with this addendum.

4. REQUEST FOR QUALIFICATIONS

A. V – Submittal Format, Section C – Contents, TAB 4 – Respondent Information – Section H:

1. REVISE required General Building Contract License to "A or B License."

B. Appendix A:

1. Project Description: REVISE to read: "Construction of a new elementary school campus, Increment 1 – site features including paving, hardscape, landscape and irrigation; fencing, playgrounds, parking, and site lighting. Also included in scope are Increment 2 site and building low voltage work and shade structures."

6. BID QUESTIONS

A. Tab 4 – Respondent Information: (Section H) states, "respondent must hold a general building contractor license (B License)." Since this project is predominantly site work, would it be possible to modify this section to be an A or B license?

Response: Either an A or B license is acceptable for this project. Please see above.

B. Survey Scope of Work – INC 1: Are you looking for rough/finish grades, utility layout, site lights?

Response: Please review updated drawings and RFQ documents for requirements to include in proposal. Coordinate with proposing general contractor as required.

C. PLA / CWTA: Is this project subject to a Project Labor Agreement (PLA) or CWTA?

Response: This project is not subject to a PLA or CWTA.

* * * END OF ADDENDUM * * *

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LODI UNIFIED SCHOOL DISTRICT

SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

2801 W. VINE STREET
LODI, CA 95242

AGENCY APPROVAL:

REVIEWING AGENCIES STAMP HERE

LODI USD

HMC Architects
DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916.368.7990 / www.hmcarchitects.com

LICENSED ARCHITECT
JENNIFER PEARSON HUANG
C-35691
REN. 05/31/25
STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

OWNER
LODI UNIFIED SCHOOL DISTRICT
CONSULTANT 1 ADDRESS CONSULTANT 1 ADDRESS
CONSULTANT 1 PHONE

CIVIL
MCR ENGINEERING
1242 DUPONT COURT MANTECA, CA 95336
209.239.6229

LANDSCAPE
MTW GROUP
2707 K STREET, SUITE 201 SACRAMENTO, CA 95816
916.369.3990

ELECTRICAL
OPTIMIZED ENERGY & FACILITES CONSULTING, INC
5734 LONETREE BLVD ROCKLIN, CA 95765
916.626.5518

STRUCTURAL
RW CONSULTING ENGINEERS
1450 HARBOUR BLVD SUITE F WEST SACRAMENTO, CA 95691
916.369.3990

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
COVER SHEET

DSA SUBMITTAL

DATE: **2025-12-09** | CLIENT PROJ NO:

SHEET:

G0.10.1

Autodesk Docs://3431010000 LODI USD SAMUEL M. GANTNER ES R24/3431010000-A-LUSD-GANTNER ES-SITE.rvt
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PLEASE RECYCLE

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GENERAL NOTES

1. CONSTRUCTION DOCUMENTS DESCRIBE THE PRODUCTS, SYSTEMS, QUANTITIES, CONFIGURATION, AND PERFORMANCE SPECIFICATIONS THAT DELIVER THE OVERALL DESIGN INTENT OF THE PROJECT.
2. THE CONSTRUCTION DOCUMENT DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ONE SHALL BE AS BINDING AS IF REQUIRED BY BOTH.
3. PERFORMANCE BY THE CONSTRUCTION TEAM SHALL BE CONSISTENT WITH THE CONSTRUCTION DRAWINGS AND SPECIFICATIONS AS NECESSARY TO DELIVER THE INDICATED RESULTS OF THE DESIGN INTENT.
4. VERIFY ALL DIMENSIONS, LOCATIONS OF EXISTING UTILITIES, AND CONDITIONS ON THE JOB SITE PRIOR TO THE START OF WORK OR PORTIONS OF THE WORK. NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES BETWEEN THE ACTUAL FIELD CONDITIONS AND THE CONSTRUCTION DOCUMENTS. EXISTING CONDITIONS ARE INDICATED AS A RESULT OF FIELD OBSERVATIONS, INFORMATION SHOWN ON AVAILABLE DOCUMENTS AND FIELD CONDITIONS AT THE TIME OF PREPARATION.
5. ALL MATERIALS AND WORKMANSHIP SHALL COMPLY WITH ALL GOVERNING CODES, ORDINANCES, REGULATIONS AND LAWS.
6. THE DESIGN ADEQUACY AND SAFETY OF ERECTION BRACING, SHORING, TEMPORARY SUPPORTS AND SCAFFOLDING IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
7. WHERE ANY CONFLICT OCCURS BETWEEN THE REQUIREMENTS OF LAWS, CODES, ORDINANCES, RULES AND REGULATIONS, THE MOST STRINGENT SHALL GOVERN.
8. IN NO CASE SHALL WORKING DIMENSIONS BE SCALED FROM PLANS, SECTIONS OR DETAILS ON THE DRAWINGS.
9. DETAILS MARKED 'TYPICAL' SHALL APPLY IN ALL CASES UNLESS SPECIFICALLY NOTED OTHERWISE.
10. ENACT ALL MEASURES TO PROTECT AND SAFEGUARD ALL EXISTING ELEMENTS TO REMAIN FROM BEING DAMAGED. REPLACE OR REPAIR EXISTING ELEMENTS DAMAGED BY THE EXECUTION OF THIS CONTRACT TO EQUAL OR BETTER CONDITION.
11. PRIOR TO THE START OF WORK THE CONTRACTOR SHALL COORDINATE BETWEEN THE REQUIREMENTS OF ALL DISCIPLINES HEREIN AND BETWEEN THE REQUIREMENTS OF ALL DRAWINGS AND SPECIFICATIONS IN ORDER THAT ALL ITEMS SATISFACTORILY RELATE TO ONE ANOTHER. NOTIFY ARCHITECT IMMEDIATELY REGARDING ANY ITEMS THAT CANNOT BE COORDINATED.
12. CONTRACTOR SHALL EXCERCISE EXTREME CAUTION IN EXCAVATING AND TRENCHING ON THIS SITE TO AVOID EXISTING DUCTS, PIPING, CONDUIT, ETC. AND TO PREVENT HAZARD TO PERSONNEL AND/OR TO EXISTING UNDERGROUND UTILITIES OR STRUCTURES. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT SHOULD SUCH UNIDENTIFIED CONDITIONS BE DISCOVERED. THESE DRAWINGS AND SPECIFICATIONS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
13. CUTTING, BORING, SAWCUTTING OR DRILLING THROUGH THE EXISTING OR NEW STRUCTURAL ELEMENTS SHALL NOT TO BE STARTED UNTIL THE DETAILS HAVE BEEN REVIEWED AND APPROVED BY THE ARCHITECT, AND STRUCTURAL ENGINEER OF RECORD.
14. ALL WORK SHALL CONFORM TO 2022 EDITION TITLE 24, CALIFORNIA CODE OF REGULATION (CCR)
15. THE LIMIT OF WORK LINE SHOWS THESE DRAWINGS IS AN APPROXIMATE LIMIT OF WORK ONLY. REFER TO CONSULTANT DRAWINGS FOR ADDITIONAL WORK, INCLUDING BUT NOT LIMITED TO INSTALLATION OF CONDUIT, MANHOLES, PULLBOXES, ETC WHICH ARE TO BE PART OF THIS WORK, ALTHOUGH OCCURING OUTSIDE OF SHOWN LIMIT OF WORK LINES.
16. GRADING PLANS, DRAINAGE IMPROVEMENTS, ROAD AND ACCESS REQUIREMENTS AND ENVIRONMENTAL HEALTH CONSIDERATIONS SHALL COMPLY WITH ALL LOCAL ORDINANCES.
17. SAFETY DURING CONSTRUCTION SHALL COMPLY WITH CFC CHAPTER 33.
18. CONTRACTOR IS TO REVIEW AND COMPLY WITH ALL REQUIREMENTS AND MITIGATION MEASURES SET FORTH IN BOTH THE ENVIRONMENTAL IMPACT REPORT (ADDENDUM TO THE ENVIRONMENTAL IMPACT REPORT | SCH NO. 2002071120 INCLUDING ATTACHED BIOLOGICAL RESOURCES TECHNICAL REPORT.
19. NO DUMPING OR PLACING OF ANY DIRT OR DEBRIS SHALL BE ALLOWED OUTSIDE OF THE CONTRACTORS LIMIT OF WORK AREA.
20. FABRICATION AND INSTALLATION OF DEFERRED SUBMITTAL ITEMS SHALL NOT BE STARTED UNTIL CONTRACTOR'S DRAWINGS, SPECIFICATIONS, AND ENGINEERING CALCULATIONS FOR THE ACTUAL SYSTEMS TO BE INSTALLED HAVE BEEN ACCEPTED AND SIGNED BY THE ARCHITECT OR STRUCTURAL ENGINEER AND APPROVED BY THE DSA. LIST DEFERRED SUBMITTAL ITEMS FOR THIS PROJECT.
21. CHANGE TO THE APPROVED DRAWINGS AND SPECIFICATIONS SHALL BE MADE BY ADDENDA OR CONSTRUCTION CHANGE DOCUMENT (CCD) APPROVED BY DSA, AS REQUIRED BY SECTION 4-338, PART 1, TITLE 24 CCR.
22. A "DSA CERTIFIED" PROJECT INSPECTOR EMPLOYED BY THE DISTRICT (OWNER) AND APPROVED BY DSA SHALL PROVIDE CONTINUOUS INSPECTION OF WORK. THE DUTIES OF THE INSPECTOR ARE DEFINED IN SECTION 4-342, PART 1, TITLE 24, CCR. INSPECTOR TO BE CLASS 1.
23. A DSA ACCEPTED TESTING LABORATORY DIRECTLY EMPLOYED BY THE DISTRICT (OWNER) SHALL CONDUCT ALL THE REQUIRED TESTS AND INSPECTIONS FOR THE PROJECT. THE REPORTS SHALL BE SUBMITTED TO ARCHITECT OF RECORD, STRUCTURAL ENGINEER OF RECORD, OWNER, INSPECTOR OR RECORD, AND THE DSA FIELD ENGINEER. THE REPORTS OF ANY FAILURES OF TESTS AND INSPECTIONS ARE TO BE SUBMITTED TO DSA DISTRICT STRUCTURAL ENGINEER.
24. THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS THAT THE WORK OF THE ALTERATION, REHABILITATION, OR RECONSTRUCTION IS TO BE IN ACCORDANCE WITH TITLE 24, CCR. SHOULD ANY EXISTING CONDITIONS SUCH AS DETERIORATION OR NON-COMPLYING CONSTRUCTION BE DISCOVERED WHICH IS NOT COVERED BY THE DSA APPROVED CONTRACT DOCUMENTS WHEREIN THE FINISHED WORK WILL NOT COMPLY WITH TITLE 24, CCR,, A CONSTRUCTION CHANGE DOCUMENT (CCD), OR A SEPARATE SET OF PLANS AND SPECIFICATIONS DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY DSA BEFORE PROCEEDING WITH THE WORK. (SECTION 4-317(C), PART 1, TITLE 24, CCR)

ACCEPTANCE TESTING REQUIREMENTS

THE CALIFORNIA ENERGY CODE SECTION 10-103 REQUIRES ACCEPTANCE TESTING ON ALL NEWLY INSTALLED LIGHTING CONTROLS, MECHANICAL SYSTEMS, ENVELOPES, AND PROCESS EQUIPMENT AFTER INSTALLATION AND BEFORE PROJECT COMPLETION. AN ACCEPTANCE TEST IS A FUNCTIONAL PERFORMANCE TEST TO HELP ENSURE THAT NEWLY INSTALLED EQUIPMENT IS OPERATING AND IN COMPLIANCE WITH ENERGY CODE.

LIGHTING CONTROLS ACCEPTANCE TESTS MUST BE PERFORMED BY A CERTIFIED LIGHTING CONTROLS ACCEPTANCE TEST TECHNICIAN (ATT).

MECHANICAL SYSTEM ACCEPTANCE TEST MUST BE PERFORMED BY A CERTIFIED MECHANICAL ATT FOR PROJECTS SUBMITTED ON OR AFTER OCTOBER 1, 2021.

A LISTING OF CERTIFIED ATTs CAN BE FOUND AT: HTTPS://WWW ENERGY.CA.GOV/PROGRAMS-AND-TOPICS/PROGRAMS/ACCEPTANCE-TEST-TECHNICIAN- CERTIFICATION-PROVIDER-PROGAM/ACCEPTANCE

THE ACCEPTANCE TESTING PROCEDURES MUST BE REPEATED. AND DEFICIENCIES MUST BE CORRECTED BY THE BUILDER OR INSTALLING CONTRACTOR UNTIL THE CONSTUCTION/ INSTALLATION OF THE SPECIFIED SYSTEMS CONFORM AND PASS THE REQUIRED ACCEPTANCE CRITERIA.

PROJECT INSPECTORS WILL BE COLLECTING THE FORMS TO CONFIRM THAT THE REQUIRED ACCEPTANCE TESTS HAVE BEEN COMPLETED.

CODES

PARTIAL LIST OF APPLICABLE CODES

2022	CALIFORNIA ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R.
2022	CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R. (2021 INTERNATIONAL BUILDING CODE VOLUMES 1 & 2 AND 2022 CALIFORNIA AMENDMENTS)
2022	CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R. (2020 NATIONAL ELECTRICAL CODE AND 2022 CALIFORNIA AMENDMENTS)
2022	CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24 C.C.R. (2021 UNIFORM MECHANICAL CODE AND 2022 CALIFORNIA AMENDMENTS)
2022	CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24 C.C.R. (2021 UNIFORM PLUMBING CODE AND 2022 CALIFORNIA AMENDMENTS)
2022	CALIFORNIA ENERGY CODE (CEC), PART 6, TITLE 24 C.C.R.
2022	CALIFORNIA HISTORICAL BUILDING CODE (CHBC), PART 8, TITLE 24 C.C.R.
2022	CALIFORNIA FIRE CODE, PART 9, TITLE 24 C.C.R. (2021 INTERNATIONAL FIRE CODE AND 2022 CALIFORNIA AMENDMENTS)
2022	CALIFORNIA EXISTING BUILDING CODE (CEBC), PART 10, TITLE 24 C.C.R. (2021 INTERNATIONAL EXISTING CODE AND 2022 CALIFORNIA AMENDMENTS)
2022	CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN), PART 11, TITLE 24 C.C.R.
2022	CALIFORNIA REFERENCED STANDARDS, PART 12,TITLE 24 C.C.R.
TITLE 19	C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.
2019	ASME A17.1/B44-19 SAFETY CODE FOR ELEVATORS AND ESCALATORS
2020	ASME 18.1 - SAFETY STANDARD FOR PLATFORM LIFTS AND STAIRWAY CHAIR LIFTS

PARTIAL LIST OF APPLICABLE STANDARDS

NFPA 13	STANDARD FOR AUTOMATIC FIRE SPRINKLER SYSTEMS (CA AMENDED)	2022 ED.
NFPA 14	STANDARD FOR STANDPIPE AND HOSE SYSTEMS (CA AMENDED)	2019 ED.
NFPA 17	STANDARD FOR DRY CHEMICAL EXTINGUISHING SYSTEMS	2021 ED.
NFPA 17A	STANDARD FOR WET CHEMICAL EXTINGUISHING SYSTEMS	2021 ED.
NFPA 20	STANDARD FOR STATIONARY PUMPS FOR FIRE PROTECTION	2019 ED.
NFPA 22	STANDARD FOR WATER TANKS FOR PRIVATE FIRE PROTECTION	2018 ED.
NFPA 24	STANDARD FOR THE INSTALLATION OF PRIVATE FIRE MAINS AND THEIR APPURTENANCES (CA AMENDED)	2019 ED.
NFPA 72	NATIONAL FIRE ALARM & SIGNALING CODE (CA AMENDED)	2022 ED.
NFPA 80	STANDARD FOR FIRE DOORS AND OTHER OPENING PROTECTIVES	2019 ED.
NFPA 2001	STANDARD ON CLEAN AGENT FIRE EXTINGUISHING SYSTEMS (CA AMENDED)	2018 ED.
UL 300	STANDARD FOR FIRE TESTING OF FIRE EXTINGUISHING SYSTEMS FOR PROTECTION OF COMMERCIAL COOKING EQUIPMENT	2005 (R2014)
UL 464	AUDIBLE SIGNAL APPLIANCES FOR FIRE ALARM AND SIGNALING SYSTEMS, INCLUDING ACCESSORIES	2003 ED.
UL 521	STANDARD FOR HEAT DETECTORS FOR FIRE PROTECTIVE SIGNALING SYSTEMS	1999 ED. (R2005)
UL 1971	STANDARD FOR SIGNALING DEVICES FOR THE HEARING IMPAIRED	2002 ED. (R2018)
ICC 300	STANDARD FOR BLEACHERS, FOLDING AND TELESCOPING SEATING AND GRANDSTANDS	2017 ED.

FOR A COMPLETE LIST OF APPLICABLE NFPA STANDARDS REFER TO 2022 CBC (SFM) CHAPTER 35 AND CALIFORNIA FIRE CODE CHAPTER 80.
SEE CALIFORNIA BUILDING CODE, CHAPTER 35 FOR STATE OF CALIFORNIA AMENDMENTS TO NFPA STANDARDS.

STATEMENT OF GENERAL CONFORMANCE

(X) THE DRAWINGS OR SHEETS LISTED ON THE INDEX SHEET WITH AN (*)
( ) THIS DRAWING PAGE OF SPECIFICATIONS/CALCULATIONS

HAVE BEEN PREPARED BY OTHER DESIGN PROFESSIONALS OR CONSULTANTS WHO ARE LICENSED AND/OR AUTHORIZED TO PREPARE SUCH DRAWINGS IN THIS STATE. IT HAS BEEN EXAMINED BY ME FOR:

1) DESIGN INTENT AND APPEARS TO MEET THE APPROPRIATE REQUIREMENTS OF TITLE 24, CALIFORNIA CODE OF REGULATIONS AND THE PROJECT SPECIFICATIONS PREPARED BY ME, AND
2) COORDINATION WITH MY PLANS AND SPECIFICATIONS AND IS ACCEPTABLE FOR INCORPORATION INTO THE CONSTRUCTION OF THIS PROJECT.

THE STATEMENT OF GENERAL CONFORMANCE "SHALL NOT BE CONSTRUED AS RELIEVING ME OF MY RIGHTS, DUTIES, AND RESPONSIBILITIES UNDER SECTIONS 17302 AND 81138 OF THE EDUCATION CODE AND SECTIONS 4-336, 4-341 AND 4-344" OF TITLE 24, PART 1. (TITLE 24, PART 1, SECTION 4-317 (B))

ALL DRAWINGS OR SHEETS LISTED ON THE SHEET INDEX WITH AN (*) IS/ARE IN GENERAL CONFORMANCE WITH THE PROJECT DESIGN AND HAS/HAVE BEEN COORDINATED WITH THE PROJECT PLANS AND SPECIFICATIONS.

SIGNATURE
ARCHITECT OR ENGINEER DESIGNATED TO BE IN GENERAL RESPONSIBLE CHARGE

12.09.2025
DATE

JENNIFER HUANG
PRINT NAME

C35691
LICENSE NUMBER

05.31.2027
EXPIRATION DATE

PROJECT DESCRIPTION

GENERAL DESCRIPTION OF WORK

CONSTRUCTION OF A NEW ELEMENTARY SCHOOL CAMPUS.

INC 1 - SITE FEATURES INCLUDING PAVING, HARDSCAPE, LANDSCAPE AND IRRIGATION; FENCING, PLAYGROUNDS, PARKING AND SITE LIGHTING, TRASH ENCLOSURE WITH PC SHADE STRUCTURE

INC 2 - CONSTRUCTION OF NEW CAMPUS BUILDINGS

PROJECT DATA

PROJECT ADDRESS

2801 W VINE STREET
LODI, CA 95242

PROJECT INFORMATION

TYPE OF CONSTRUCTION: **TYPE 2-B, TYPE 5-B**

OCCUPANCY: **A-3, B, E**

AUTOMATIC FIRE SPRINKLER SYSTEM: **YES**

NUMBER OF STORIES: **1**

CA CLIMATE ZONE: **12**

DEFERRED APPROVAL

1. NONE

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Grand total: 74	

SYMBOL LEGEND

TN / PN
NORTH ARROW
TICK INDICATES PLAN NORTH
ARROW INDICATES TRUE NORTH

1 / AX.XX
ELEVATION CALLOUT (TYPICAL FOR EXTERIOR)
LOCATION ON SHEET
SHEET WHERE ELEVATION IS DRAWN

A1 / A2 / A3 / A4 / AX.XX
ELEVATION CALLOUT (TYPICAL FOR INTERIOR)
LOCATION ON SHEET
SHEET WHERE ELEVATION IS DRAWN

18/AX.XX
ELEVATION CALLOUT - ALT. (FOR EXTERIOR AND INTERIOR)
LOCATION & SHEET WHERE ELEVATION IS DRAWN

SIM / 1 / AX.XX
SECTION CALLOUT
INDICATES A SIMILAR CONDITION
LOCATION ON SHEET
SHEET WHERE SECTION IS DRAWN

SIM / 1 / AX.XX
DETAIL CALLOUT
INDICATES A SIMILAR CONDITION
LOCATION ON SHEET
SHEET WHERE SECTION IS DRAWN

FIRST FLOOR / +0' - 0"
CONTROL OR DATUM POINT
NAME OF ELEVATION (IF APPLICABLE)
ELEVATION ABOVE FINISHED FLOOR

0 / 0
GRID BUBBLE
EXISTING BUILDING GRID SYMBOL
GRID NUMBER
NEW BUILDING GRID SYMBOL

101A
DOOR CALLOUT
DOOR NUMBER

FA
INTERIOR FINISH CALLOUT
MATERIAL FINISH TYPE (SEE FINISH SCHEDULE)

09-WF1
WINDOW CALLOUT
WINDOW NUMBER (SEE WINDOW SCHEDULE)

AS6A / AS4A / 55 1FB
WALL TYPE CALLOUT
WALL TYPE MARK - SEE A10.11
WALL STC RATING
WALL FIRE RATING TYPE

X / X
MATCHLINE REFERENCE
LOCATION ON SHEET
SHEET WHERE PLAN IS DRAWN

?
KEYNOTE
KEYNOTE NUMBER (SEE LEGEND ON SHEET)

ROOM EXITING INFORMATION
AREA (SQ FT)
OCCUPANT LOAD (AREA DIVIDED BY LOAD FACTOR)
OCCUPANT LOAD FACTOR (REFER TO TABLE 1004.5)
OCCUPANCY TYPE
NUMBER OF EXITS REQUIRED (REFER TO TABLE 1006.2.1)

WI999 / L / WD / HT / DP
WIC CASEWORK TAG
MANUFACTURER REFERENCE AND MODEL NUMBER
LOCK
CABINET DEPTH
CABINET HEIGHT
CABINET WIDTH

SHEET NUMBER SYSTEM

DISCIPLINE	SHEET TYPE	BUILDING LETTER, SEGMENT, (USER DEFINED)
G GENERAL	0 CODE ANALYSIS, NOTES	USED ONLY IF REQUIRED IF NOT COLUMN IS OMITTED
C CIVIL	1 SITE PLAN	
L LANDSCAPE	2 FLOOR PLAN	
A ARCHITECTURE	3 CEILING PLAN	
I INTERIORS	4 ROOF PLAN	
Q EQUIPMENT	5 EXTERIOR ELEVATIONS	
S STRUCTURAL	6 SECTIONS	
P PLUMBING	7 ENLARGED PLANS	
M MECHANICAL	8 INTERIOR ELEVATIONS	
E ELECTRICAL	9 SCHEDULES	
FA FIRE ALARM	10 DETAILS	
T TELECOM		
AV AV EQUIPMENT		
K KITCHEN		
FP FIRE PROTECTION		

A A 1 . 1 1 A . A

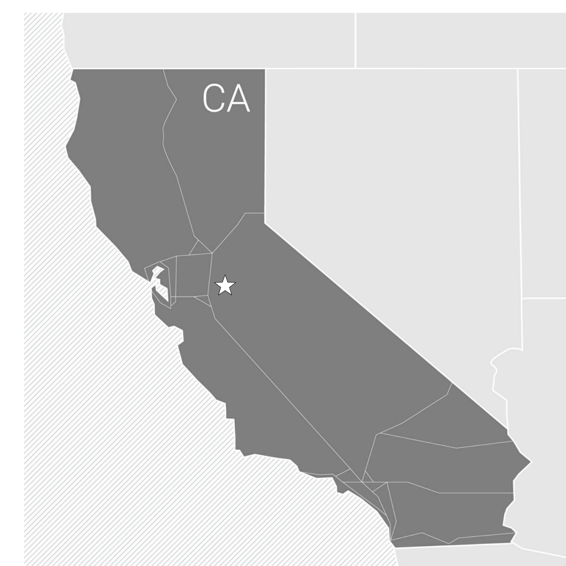
SERIES ORDER
SHEET TYPE
DISCIPLINE
SEGMENT (IF APPLICABLE)
BUILDING LETTER (IF APPLICABLE)
FLOOR LEVEL OR SEQUENTIAL ORDER
USER DEFINED (IF APPLICABLE)

ABBREVIATIONS

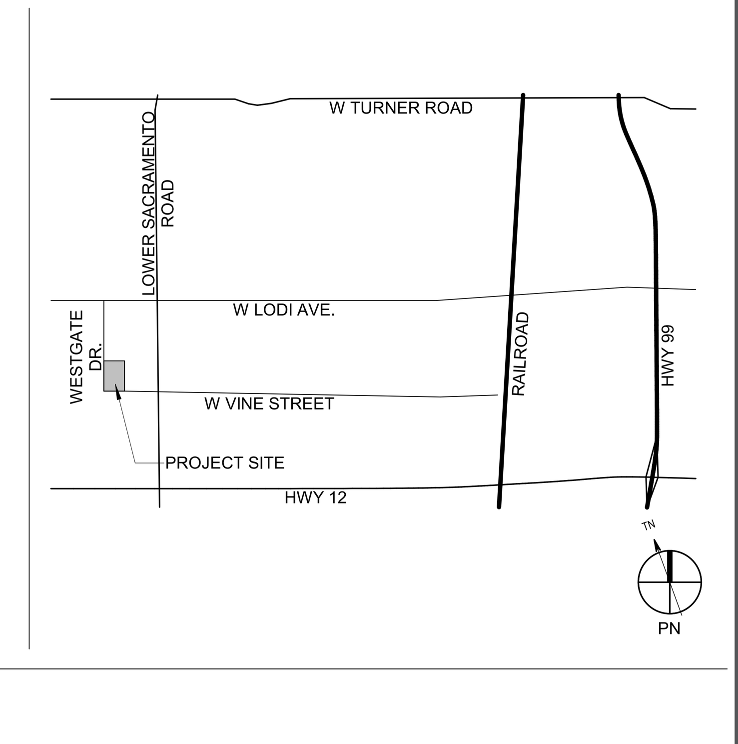
(E)	EXISTING
AB	ANCHOR BOLT
AC PAVING	ASPHALTIC CONCRETE PAVING
ACC	ACCESS/ACCESSIBLE
ACP	ACOUSTICAL CEILING PANEL
ACT	ACOUSTICAL CEILING TILE
ADJ	ADJACENT/ADJUSTABLE
AFF	ABOVE FINISH FLOOR
AGG	AGGREGATE
AHU	AIR HANDLING UNIT
ARCH	ARCHITECTURAL
ATT	ATTENUATION
AUTO	AUTOMATIC
BD	BOARD
BLCG	BLOCKING
BLDG	BUILDING
BUR	BUILT UP ROOFING
CABT	CABINET
CF	CUBIC FEET
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CFOI	CONTRACTOR FURNISHED, OWNER INSTALLED
CG	CORNER GUARD
CJ	CONTROL JOINT
CL	CENTER LINE
CLF	CHAIN LINK FENCE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COL	COLUMN
COMP	COMPRESSION / COMPOSITE
CF	CUBIC FEET
COORD	COORDINATE
CORR	CORRUGATED
CT	CERAMIC TILE
CTSK	COUNTER SKUNK
CW	CURTAINWALL
DEPR	DEPRESSED / DEPRESSION
DF	DRINKING FOUNTAIN
DIM	DIMENSION
DISP	DISPENSER
DS	DOWNSPOUT
DTL	DETAIL
DW	DISHWASHER
DWG	DRAWING
E/W	EACH WAY
EIFS SYSTEM	EXTERIOR INSULATION FINISH
EJ	EXPANSION JOINT
ELEC	ELECTRICAL
ELEV	ELEVATION / ELEVATOR
ENCL	ENCLOSE / ENCLOSURE
EOS	EDGE OF SLAB
EP	ELECTRICAL PANEL
EQ	EQUAL
ESC	EXCUTCHEON
EWC	ELECTRIC WATER COOLER
EXP	EXPOSED
FA	FIRE ALARM
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER W/ CABINET
FF	FINISH FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FSH	FLAT HEAD SCREW
FIN	FINISH
FLR	FLOOR
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FP	FIREPROOFING
FR	FIRE RATED
FRG	FIRE RATED GLASS
FRP	FIBERGLASS REINFORCED PLASTIC
FRT	FIRE RETARDANT TREATED
FS	FINISH SURFACE
FTG	FOOTING
GB	GRAB BAR
GFRC	GLASS FIBER REINFORCED CONCRETE
GL	GLASS TYPE
GLB	GLUE LAMINATED BEAM
GYP BD	GYPSUM BOARD
GYP PLAS	GYPSUM PLASTIC
HB	HOSE BIBB
HD	HEAVY DUTY
HDR	HEADER
HDWR	HARDWARE
HGT	HEIGHT
HM	HOLLOW METAL
HP	HIGH POINT
HSS	HOLLOW STEEL SECTION
ID	INSIDE DIAMTER
INT	INTERIOR
INV	INVERT
LANDS	LANDSCAPE
LAV	LAVATORY
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LP	LOW POINT
LT WT	LIGHT WEIGHT
LVR	LOUVER
MACH	MACHINE
MB	MACHINE BOLT
MDF	MEDIUM DENSITY FIBERBOARD
MDO	MEDIUM DENSITY OVERLAY
MECH	MECHANICAL
MED	MEDIUM
MEMB	MEMBRANE
MFR	MANUFACTURER
MH	MANHOLE
MO	MASONRY OPENING
MTD	MOUNTED
MTL	METAL
NIC	NOT IN CONTRACT
NR	NON RATED
NRC	NOISE REDUCTION COEFFICIENT
NTS	NOT TO SCALE
O/	OVER
O/A	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMTER
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OFVI	OWNER FURNISHED, VENDOR INSTALLED
OH	OPPOSITE HAND
OPER	OPERABLE
OPNG	OPENING
ORD	OVERFLOW ROOF DRAIN
P/L	PROPERTY LINE
PA	PUBLIC ADDRESS
PAF	POWDER ACTUATED FASTENER PAVING
PCC	PORTLAND CEMENT CONCRETE PAVING
PED	PEDESTRIAN
PERF	PERFORATED
PERIM	PERIMETER
PERP	PERPENDICULAR
PH	PANIC HARDWARE
PIV	POST INDICATOR VALVE
PL	PLATE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLUMB	PLUMBING
PNL	PANEL
PNT	PAINT / PAINTED
POC	POINT OF CONNECTION
POLY ISO	POLYISOCYANURATE
PREFIN	PREFINISHED
PREP	PREP / PREPARATION
PTC	POST TENSIONED CONCRETE
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
PTS	PNEUMATIC TUBE STATION / SYSTEM
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
QT	QUARRY TILE
R	RADIUS, RISER
RB	RESILIENT BASE
RD	ROOF DRAIN
RECEPT	ECEPTACLE
REF	REFERENCE
REFL	REFLECT(ED), (IVE)
REFL	REFLECT(ED), (IVE)
REFR	REFRIGERATOR
REINF	REINFORCE/REINFORCED/ REINFORCEMENT
REM	REMOVE
RH	ROUND HEAD
RHS	ROUND HEAD SCREW
RO	ROUGH OPENING
ROW	RIGHT OF WAY
SCH	SCHEDULE (FOR PIPE)
SCHED	SCHEDULE / SCHEDULING
SD	STORM DRAIN / SOAP DISPENSER
SECT	SECTION
SG	SAFETY GLASS
SHT	SHEET
SHTG	SHEATHING
SMS	SHEET METAL SCREW
SND	SANITARY NAPKIN DISPOSAL
SOV	SHUT OFF VALVE
SPEC	SPECIFICATIONS
SS	STAINLESS STEEL
STC	SOUND TRAMISSION CLASS
STL	STEEL
STSMS SCREW	SELF TAPPING SHEET METAL
SUSP	SUSPENDED
SV	SHEET VINYL
SYM	SYMMETRICAL
T	TREAD
T&B	TOP AND BOTTOM
TO	TOP OF
TOC	TOP OF CURB / CONCRETE
TOP	TOP OF PARAPET
TOS	TOP OF STEEL
TOW	TOP OF WALL
TPD	TOILET PAPER DISPENSER
TS	TACKABLE SURFACE
U/C	UNDER CABINET (OR COUNTER
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
VAC	VACUUM
VB	VAPOR BARRIER
VCT	VINYL COMPOSITION TILE
VIF	VERIFY IN FIELD
VTR	VENT THROUGH ROOF
VWC	VINYL WALL COVERING
W/	WITH
W/O	WITHOUT
WB	WOOD BASE
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WGT	WEIGHT
WH	WATER HEATER
WP	WATERPROOFING/WALL PROTECTION
WR	WATER RESISTANT
WRGB	WATER RESISTANT GYPSUM BOARD
WS	WOOD SCREW
WSCT	WAINSCOT
WWF	WELDED WIRE FABRIC

NOTE:
OTHER ABBREVIATIONS USED ON THESE DRAWINGS ARE CONSIDERED STANDARDS IN THE BUILDING INDUSTRY. CONTACT ARCHITECT FOR NECESSARY CLARIFICATION.

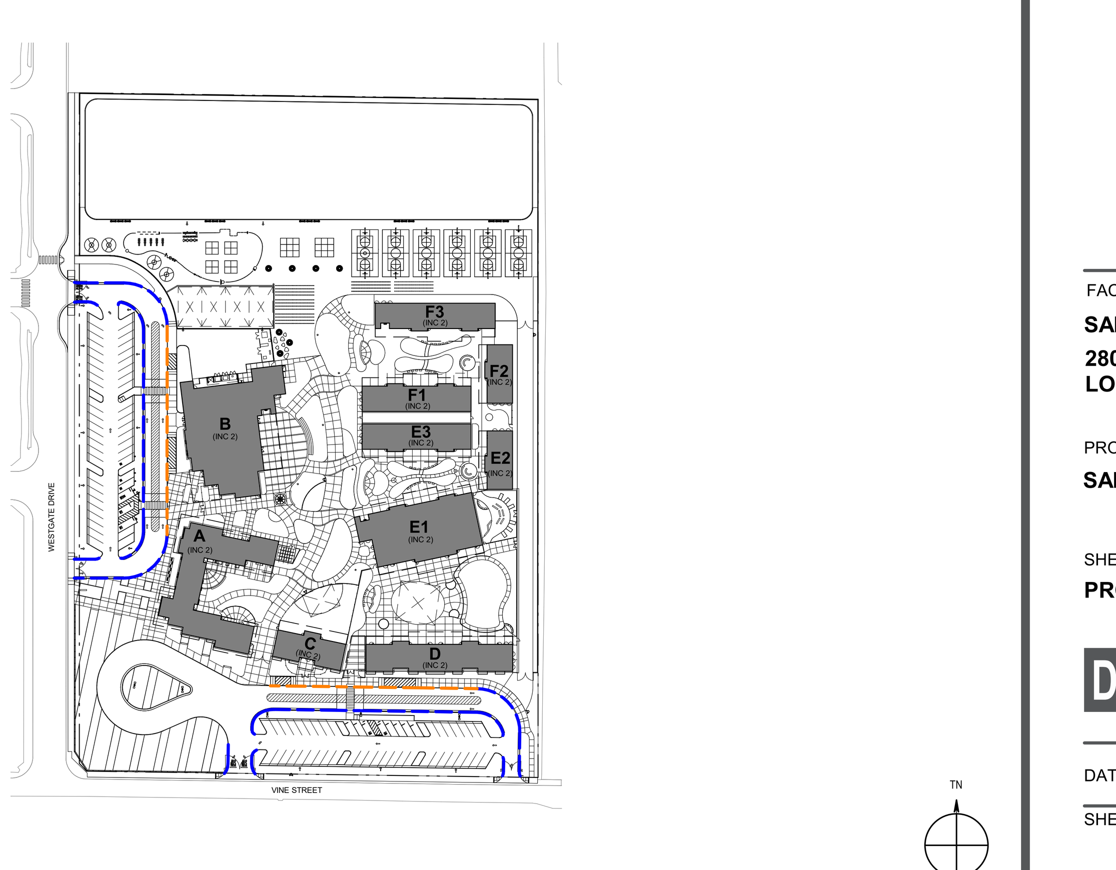
STATE MAP



VICINITY MAP



OVERALL SITE PLAN



AGENCY APPROVAL:

LODI USD

HMC Architects DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

LICENSED ARCHITECT
JENNIFER PEARSON HUANG
C-35691
REN. 05/31/25
STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
PROJECT DATA SHEET

DSA SUBMITTAL

DATE: **12/09/2025** CLIENT PROJ NO:

SHEET:
G0.11.1

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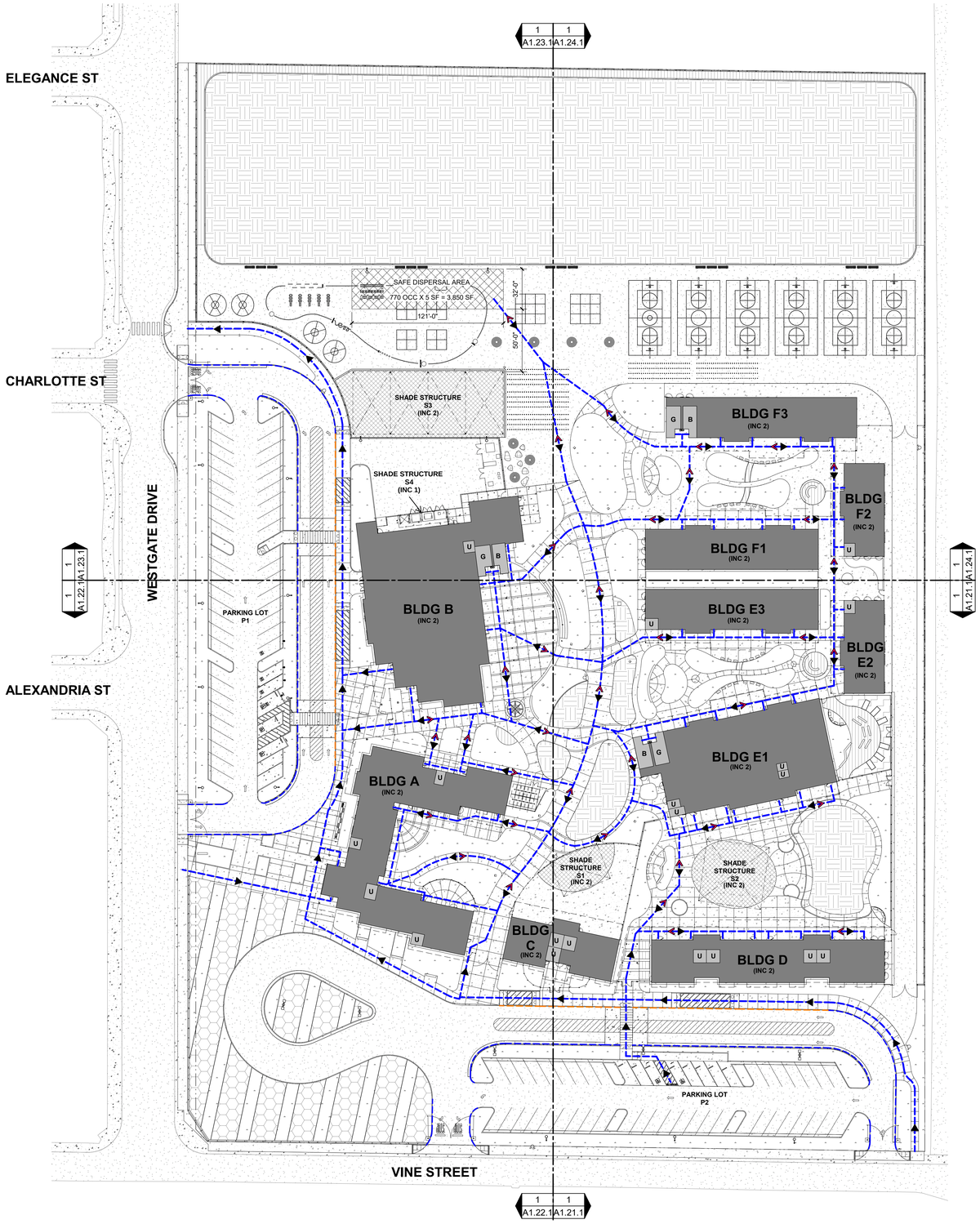

BUILDING DATA (INC 2)

	OCCUPANT TYPE	CONST. TYPE	SPRINKLER SYSTEM	ALLOWABLE AREA S1	ALLOWABLE HEIGHT	ALLOWABLE NO. OF STORIES
BLDG A	B, E NON-SEPERATED	II-B	YES	58,000 SF	75'-0"	4
BLDG B	A-3	II-B	YES	38,000 SF	75'-0"	3
BLDG C, D	E	II-B	YES	58,000 SF	75'-0"	4
BLDG E1, E2, E3, F1, F2,F3	E	II-B	YES	58,000 SF	75'-0"	4
SHADE STRUCTURE S1	E	V-B	NO	9,500 SF	60'-0"	1
SHADE STRUCTURE S2	E	V-B	NO	9,500 SF	60'-0"	1
SHADE STRUCTURE S3	E	V-B	NO	9,500 SF	60'-0"	1
SHADE STRUCTURE S4	U	V-B	NO	5,500 SF	40'-0"	1

LEGEND

- PROPERTY LINE
- ASSUMED PROPERTY LINE
- ACCESIBLE PATH OF TRAVEL
- PATH OF TRAVEL TO AREA OF SAFE DISPERSAL
- NEW BUILDING
- ACCESSIBLE RESTROOM
- U — UNISEX RESTROOM
- G — GIRLS RESTROOM
- B — BOYS RESTROOM
- S — STAFF RESTROOM

PARKING TABULATION

PARKING STALLS

PARKING LOT P1	50
PARKING LOT P2	50
TOTAL PARKING STALLS	100

PER CBC TABLE 11B-208.2
ACCESSIBLE PARKING STALLS = 4 (REQUIRED) / 4 (PROVIDED)

ACC. VAN = 1 (REQUIRED) / 2 (PROVIDED)

ELECTRIC VEHICLE CHARGING STATIONS
CAL GREEN TABLE 5.106.5.3.1

EV CAPABLE SPACES = 17 (REQUIRED) / 17 (PROVIDED)

EV CAPABLE SPACES W/ EVSE = 4 (REQUIRED) / 4* (PROVIDED)

* INCLUDES 1 VAN ACCESSIBLE CHARGING STALL

BIKE PARKING TABULATION

CAL GREEN 5.106.4.2.1
STUDENT BYCICLE PARKING:
(4, 2 BIKE RACKS PER BUILDING AT 4 BUILDINGS)

32 REQUIRED
40 PROVIDED

CAL GREEN 5.106.4.2.2
STAFF BICYCLE PARKING:
(2 PER BUILDING AT 4 BUILDINGS)

8 REQUIRED
8 PROVIDED

PATH OF TRAVEL STATEMENT

PATH OF TRAVEL, TECHNICAL REQUIREMENTS FOR ACCESSIBLE ROUTE:

ACCESSIBLE PATH OF TRAVEL AS INDICATED ON PLAN IS A BARRIER-FREE ACCESS ROUTE WITHOUT ABRUPT LEVEL CHANGES EXCEEDING 1/2" IF BEVELED AT 1:2 MAXIMUM SLOPE OR VERTICAL LEVEL CHANGES NOT EXCEEDING 1/4" MAXIMUM AND AT LEAST 48" IN WIDTH. SURFACE IS STABLE, FIRM, AND SLIP-RESISTANT. CROSS-SLOPE SHALL NOT BE STEEBER THAN 1:48 AND SLOPE IN THE DIRECTION OF TRAVEL SHALL NO BE STEEPER THAN 1:20. ACCESSIBLE PATH OF TRAVEL SHALL BE MAINTAINED FREE OF OVERHANGING OBSTRUCTIONS TO 80" MINIMUM AND FREE OF OBJECTS PROTRUDING MORE THAN 4" FROM THE WALL. ABOVE 27" AND LES THAN 80" ABOVE THE FLOOR. ARCHITECTS SHALL VERIFY THAT THERE ARE NO BARRIERS IN THE BATH OF TRAVEL.

DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE STATEMENT:

THE P.O.T. IDENTIFIED IN THESE CONSTRUCTION DOCUMENTS MEETS THE REQUIREMENTS OF THE CURRENT APPLICABLE CALIFORNIA BUILDING CODE (CBC) ACCESSIBILITY PROVISIONS FOR PATH OF TRAVEL REQUIREMENTS FOR ALTERATIONS, ADDITIONS, AND STRUCTURAL REPAIRS. AS PART OF THE DESIGN OF THIS PROJECT, THE P.O.T. WAS EXAMINED AND ANY ELEMENTS COMPONENTS, OR PORTIONS OF THE P.O.T THAT WERE DETERMINED TO BE NON-COMPLIANT WITH THE CBC HAVE BEEN IDENTIFIED AND THE CORRECTIVE WORK NECESSARY TO BRING THEM INTO COMPLIANCE HAS BEEN INCLUDED WITHIN THE SCOPE OF THIS PROJECTS WORK THROUGH DETAIL, DRAWINGS, AND SPECIFICATIONSINCORPORATED INTO THESE CONSTRUCTION DOCUMENTS. ANY NON-COMPLIANT ELEMENTS OR PORTIONS OF THE P.O.T. THAT WILL NIT BE CORRECTED BY THIS PROJECT BASED ON VALUATION THRESHOLD LIMITATIONS OR A FINDING OF UNREASONABLE HARDSHIP ARE INDICATED BASED IN THESE CONSTRUCTION DOCUMENTS.

DURING CONSTRUCTION, IF P.O.T. ITEMS WITHIN THE SCOPE OF THE PROJECT REPRESENTED AS CBC COMPLIANT ARE FOUND TO BE NON-CONFORMING BEYOND REASONABLE CONSRUCTION TOLERANCES, THE ITEMS SHALL BE BROUGHT INTO COMPLIANCE WITH THE CBC AS A PART OF THIS PROJECT BY MEANS OF A CONSTRUCTION CHANGE DOCUMENT.

CODE SITE PLAN 1
1" = 40'-0"

AGENCY APPROVAL:

LODI USD

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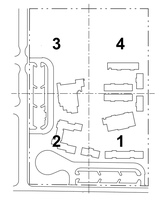
LICENSED ARCHITECT JENNIFER PEARSON-HANG C-35691 REN. 05/31/25 STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
CODE SITE PLAN

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

G1.11.1

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DSA 810

FIRE & LIFE SAFETY SITE CONDITIONS SUBMITTAL

Division of the State Architect (DSA) documents referenced within this publication are available on the DSA Forms or DSA Publications webpages.

To facilitate the Division of the State Architect's (DSA) fire and life safety plan review of project site conditions, DSA requires the design professional to provide the following information at time of project submittal for projects consisting of construction of a new campus, construction of new building(s), additions to existing buildings, and for site alternate design means for fire department emergency vehicle access, and fire suppression water supply.

Information associated with compliance items 1 through 3 below is to be provided for all project types indicated above. Information associated with items 4 through 7 is to be completed when an alternate means is utilized. Acknowledgement by the school district and signature from the Local Fire Authority (LFA) is only required when an alternate design means is being requested.

The Project Information and Fire & Life Safety Information sections are to be completed for all projects and imaged onto the fire access site plan. When an alternate design/means is proposed, all sections on pages 1 and 2 are to be completed and imaged on the fire access site plan.

For additional information refer to the instructions at the end of this form and DSA Policy PL 09-01: Fire Flow for Buildings.

PROJECT INFORMATION	
School District/Owner:	Lodi Unified School District
Project Name/School:	Samuel M. Gantner Elementary School
Project Address:	2801 W Vine Street

FIRE & LIFE SAFETY INFORMATION				
1.	Has a fire hydrant flow test been performed within the past 12 months? *(If yes, provide a copy of the test data.)*	Yes ☑		No ☐
2.	Was the fire hydrant water flow test performed as part of this LFA review?	Yes ☐		No ☑
3.	Is the project located within a designated fire hazard severity zone (FHSZ) as established by Cal-Fire? *(If yes, indicate FHSZ classification below.)*	Yes ☐		No ☑
	Refer to the following website for FHSZ locations: Fire Hazard Severity Zones in State Responsibility Area	Moderate ☐	High ☐	Very High ☐
	Wildland Interface Area (WIFA) *(If any designations are checked, project design must meet the requirements of CBC Chapter 7A.)*			WIFA ☐

CONDITION MEANS AND METHODS RESOLUTION		ALTERNATE ACCEPTED			
		Yes	No	N/A	N/R
4.	Emergency vehicle access roadways do not meet CFC requirements.				
4a.	**Acceptable Alternate:** Emergency vehicle and personnel access as proposed by the project architect is acceptable for providing fire suppression and protection of life and property.				
5.	**Fire Hydrants:** Number and spacing does not meet CFC requirements.				
5a.	**Acceptable Alternate:** Number of fire hydrants and spacing as proposed by the project architect is acceptable for fire suppression and protection of life and property.				
6.	**Fire Hydrants:** Water flow and pressure are less than CFC minimum.				
6a.	**Acceptable Alternate:** The available flow and pressure is acceptable for providing fire suppression and protection of life and property.				
7.	Location of fire department connection(s) serving fire sprinkler systems or standpipe systems does not meet CFC requirements.				
7a.	**Acceptable Alternate:** The location of fire department connection serving the fire sprinkler system and/or standpipe system is acceptable for providing fire suppression and protection of life and property.				

School District Acceptance of Acceptable Design Alternates

By signing this form, the school district acknowledges and accepts the proposed design as an alternative to California Building Code (CBC) and California Fire Code (CFC) minimum requirements, as indicated by one or more of the conditions indicated at items 4a, 5a, 6a or 7a, for providing fire and life safety protection of life and property.

Accepted by: _____ Title: _____

Signature: _____ Date: _____

LOCAL FIRE AUTHORITY (LFA) INFORMATION	
LFA Agency Name:	
LFA Review Official:	
Title:	Work Phone:
Work Email:	

LFA Reviewer's Signature: _____ Date: _____

CITY OF LODI
FIRE DEPARTMENT
210 WEST ELM STREET
LODI, CALIFORNIA 95240

Est. 1907

October 10, 2025

Attn: Amberly Kidder, Marc Karim
Lodi Unified School District
880 N. Guild Ave. Lodi, CA 95240

RE: HYDRANT FLOW TEST 2801 W. VINE ST. LODI

Dear Amberly and Marc:

On Thursday October 08, 2025, Lodi Fire Dept. Engine 2034, conducted a hydrant flow test on hydrant # N1190, located at 2801 W. Vine St. and hydrant # N1057, located on the south west corner of Westgate Dr. and La Jolla Wy.

The test was completed at the request of Marc Karim, Lead Construction Specialist.

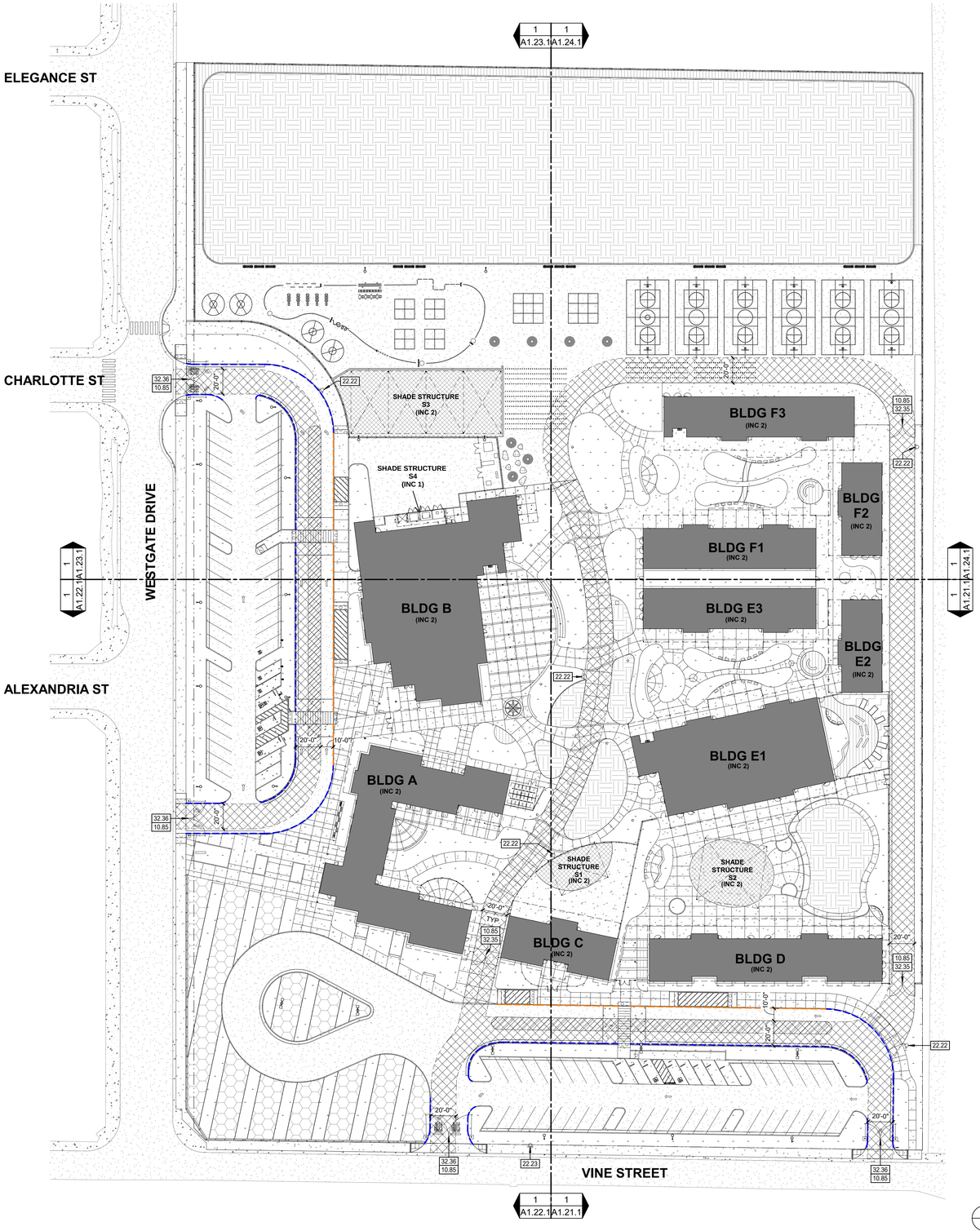
Results are as follows:

Hydrant # N1190	Hydrant # N1057
Static Pressure – 70	Static Pressure - 72
Residual Pressure – 44	Residual Pressure - 48
GPM – 1237 with 2 1/2" diameter orifice	GPM – 1293 with 2 1/2" diameter orifice

Thank you.

Ryan Smart
Fire Marshal
City of Lodi Fire Department
210 W. Elm St.
Lodi, CA 95240
rsmart@lodi.gov

FIRE ADMINISTRATION (209) 333-6755
FIRE PREVENTION (209) 333-6739
FAX (209) 333-6844



LOCAL FIRE AUTHORITY SITE PLAN 1
1" = 40'-0"

LEGEND

- PROPERTY LINE
- MATCHLINE
- PAINTED FIRE LANE NO PARKING
- FIRE HYDRANT
- NEW BUILDING (INC 2)
- PHASE 1 FIRE LANE
- CONCRETE, SEE CIVIL
- ASPHALT, SEE CIVIL
- GRASS, SEE LANDSCAPE
- ARTIFICIAL TURF, SEE LANDSCAPE
- PLANTING, SEE LANDSCAPE
- GRAVEL, SEE LANDSCAPE
- DECOMPOSED GRAVEL, SEE LANDSCAPE
- CHAINLINK FENCE
- DECORATE METAL FENCING

KEYNOTES

10.85	KNOX LOCK
22.22	FIRE HYDRANT | SEE CIVIL
22.23	EXISTING FIRE HYDRANT
32.35	GATE, 20'-0" MIN. CLEAR
32.36	SWING ARM BARRIER GATE - DOUBLE

AGENCY APPROVAL:

LODI USD

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LICENSED ARCHITECT JENNIFER PEARSON HWANG C-35691 REN. 05/31/25 STATE OF CALIFORNIA

ISSUE

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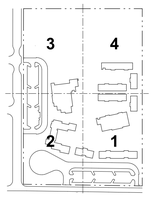
KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
LOCAL FIRE AUTHORITY SITE ACCESS PLAN

DSA SUBMITTAL

DATE: **12/09/2025** CLIENT PROJ NO:

SHEET:

G1.51.1

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GENERAL NOTES:

1. THE CONTRACTOR SHALL EXERCISE DUE CAUTION AND SHALL CAREFULLY PRESERVE BENCH MARKS, REFERENCE POINTS AND ALL SURVEY STAKES, AND SHALL BEAR ALL EXPENSE FOR REPLACEMENT AND/OR ERRORS CAUSED BY THEIR UNNECESSARY LOSS OR DISTURBANCE. ALL CENTERLINE AND/OR SURVEY MONUMENTS SHALL BE PRESERVED OR RESET AT THE END OF CONSTRUCTION.

2. UNLESS OTHERWISE STATED, ALL STATIONS INDICATED ON THE IMPROVEMENT PLANS ARE REFERENCED TO THE CENTERLINE OF THE STREET. ALL STATIONS OFF CENTER ARE PERPENDICULAR TO OR RADIALLY OPPOSITE CENTERLINE STATIONS, UNLESS OTHERWISE NOTED.

3. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY FIELD CHANGES MADE WITHOUT WRITTEN AUTHORIZATION FROM THE CITY ENGINEER.

4. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAG MAN OTHER DEVICES NECESSARY FOR PUBLIC SAFETY IN ACCORDANCE WITH THE CURRENT OR ISSUE OF "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" PUBLISHED BY THE U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION.

5. THE OFFICE OF THE CITY ENGINEER SHALL BE NOTIFIED AT LEAST 24 HOURS IN ADVANCE OF ANY WORK.

6. LODI ELECTRIC, P. G. & E., TELEPHONE AND CABLE TV UNDERGROUND WORK SHALL BE BE COMPLETED PRIOR TO CONSTRUCTION OF THE CURB, GUTTER, SIDEWALK AND PAVING.

7. THE CITY OF LODI AND ASSOCIATED UTILITY COMPANY AND RESIDENCES TO BE AFFECTED SHALL BE NOTIFIED IMMEDIATELY UPON ANY UTILITY SERVICE DISRUPTION OTHER THAN SPECIFIED ON THESE IMPROVEMENT PLANS AND A 24 HOUR NOTICE SHALL BE GIVEN FOR ANY PLANNED DISRUPTION.

8. THE CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE CITY OF DEPARTMENT OF PUBLIC WORKS OR ANY OTHER APPLICABLE AGENCIES PRIOR TO LODI, COMMENCEMENT OF WORK WITHIN EXISTING RIGHT-OF-WAY OR EASEMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS AND LICENSES REQUIRED FOR THE CONSTRUCTION AND COMPLETION OF THE PROJECT.

9. STREET SIGNS, TRAFFIC CONTROL SIGNS, AND PAVEMENT MARKINGS SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR AT LOCATIONS ESTABLISHED BY THE ENGINEER.

10. ASPHALT CONCRETE SHALL BE PLACED ONLY WHEN THE ATMOSPHERIC TEMPERATURE IS ABOVE 50°F.

11. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF THE REMOVAL OR RELOCATION OF ALL EXISTING UTILITIES WITH RESPECTIVE UTILITY COMPANIES.

12. RURAL DRIVEWAY IMPACTED DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL STATE.

13. DRAWING NUMBERS SHOWN ON THE PLANS REFER TO DRAWINGS CONTAINED IN THE CITY OF LODI STANDARD SPECIFICATIONS, THUS: (I.E. STD PLAN 121).

14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING IMPROVEMENTS FROM DAMAGE. COST OF REPLACING EXISTING IMPROVEMENTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEMS REQUIRING REMOVAL AND REPLACEMENT OF EXISTING IMPROVEMENTS.

15. WHENEVER PAVEMENT IS BROKEN OR CUT IN THE INSTALLATION OF THE WORK COVERED BY THESE SPECIFICATIONS, THE PAVEMENT SHALL BE REPLACED, AFTER PROPER BACKFILLING, WITH PAVEMENT MATERIALS EQUAL TO OR BETTER THAN THE MATERIALS USED IN THE ORIGINAL PAVING. THE FINISHED PAVEMENT SHALL BE SUBJECT TO THE APPROVAL OF THE CITY ENGINEER, OR CALTRANS, WHERE APPLICABLE.

16. PAYMENT FOR PAVEMENT WILL BE MADE ONLY FOR AREAS SHOWN ON THE PLANS. REPLACEMENT OF PAVEMENT WHICH IS BROKEN OR CUT DURING THE INSTALLATION OF THE WORK COVERED BY THESE SPECIFICATIONS, AND WHICH LIES OUTSIDE OF SAID AREAS, SHALL BE INDICATED IN THE CONTRACTOR'S UNIT PRICE FOR PAVEMENT, AND NO ADDITIONAL PAYMENT SHALL BE MADE FOR SUCH WORK.

17. WE CALL YOUR ATTENTION TO TITLE 8 CALIFORNIA ADMINISTRATION CODE SECTION 1540 (A) (1) OF THE CONSTRUCTION SAFETY ORDERS ISSUED BY THE OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD PURSUANT TO THE CALIFORNIA OCCUPATIONS SAFETY AND HEALTH ACT OF 1973 AS AMENDED WHICH STATES: (1) PRIOR TO OPENING AN EXCAVATION EFFORT SHALL BE MADE TO DETERMINE WHETHER UNDERGROUND INSTALLATIONS; I.E. SEWER, WATER, FUEL, ELECTRICAL LINES, ETC., WILL BE ENCOUNTERED AND IF SO, WHERE SUCH UNDERGROUND INSTALLATIONS ARE LOCATED. WHEN THE EXCAVATION APPROACHES THE APPROXIMATE LOCATION OF SUCH INSTALLATION, THE EXACT LOCATION SHALL BE DETERMINED BY CAREFUL PROBING OR HAND DIGGING; AND, WHEN IT IS UNCOVERED, ADEQUATE PROTECTION SHALL BE PROVIDED FOR THE EXISTING INSTALLATION. ALL KNOWN OWNERS OF UNDERGROUND FACILITIES IN THE AREA CONCERNED SHALL BE ADVISED OF PROPOSED WORK AT LEAST 48 HOURS PRIOR TO THE START OF ACTUAL EXCAVATION.

18. ALL TRENCHES ON MAJOR AND COLLECTOR STREETS AND CROSS TRENCHES ON ALL STREETS SHALL BE PAVED WITH TEMPORARY PAVING THE SAME DAY THE PAVEMENT CUT IS MADE.

19. APPROPRIATE DUST CONTROL SHALL BE PROVIDED, AT THE CONTRACTOR'S EXPENSE TO MINIMIZE ANY DUST NUISANCE AND SHALL BE IN ACCORDANCE WITH SECTION 10 OF CALTRANS STANDARD SPECIFICATIONS AND THE REQUIREMENTS OF THE CITY OF LODI.

20. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER, PRIOR TO FINAL ACCEPTANCE, AS-BUILT DRAWINGS OF ALL IMPROVEMENTS REPRESENTED BY THE PROJECT PLANS AND SPECIFICATIONS.

21. AFTER CONSTRUCTION OF ALL IMPROVEMENTS, THE ENGINEER SHALL SUBMIT ONE SET OF REPRODUCIBLE PLANS. FINAL INVERT ELEVATIONS FOR SEWER AND STORM DRAIN LINES THAT ARE TO BE EXTENDED FOR FUTURE CONSTRUCTION SHALL ALSO BE SHOWN ON THE "AS-BUILT" PLANS ALL AS PROVIDED TO THE ENGINEER BY THE CONTRACTOR.

22. THE CONTRACTOR SHALL NOTIFY M.C.R. ENGINEERING AT LEAST 48 HOURS PRIOR TO BACKFILLNG OF ANY PIPE WHICH STUBS TO A FUTURE PHASE OF CONSTRUCTION FOR INVERT VERIFICATION. TOLERANCE SHALL BE IN ACCORDANCE WITH THE CITY OF LODI STANDARD SPECIFICATIONS.

23. REGULATING DISCHARGES OF STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY FROM SOIL DISTURBANCES OF ONE (1) ACRE OR MORE, A NOTICE OF INTENT (NOI) TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT TO DISCHARGE STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY MUST BE FILED ON THE STATE'S WEBSITE:HTTPS://SMARTS.WATERBOARDS.CA.GOV/SMARTS/FACES/SWSMARTSLOGIN.JSP , AND APPROPRIATE PERMIT REGISTRATION DOCUMENTS PAID. PRIOR TO COMMENCEMENT OF CONSTRUCTION A WDID # SHALL BE ISSUED BY THE STATE WATERBOARD. IN ADDITION, AT THE CONCLUSION OF THE PROJECT A NOTICE OF TERMINATION MUST ALSO BE FILED. IF MAILING, SEND TO ADDRESS BELOW:
   STATE WATER RESOURCES CONTROL BOARD
   P.O. BOX 100 SACRAMENTO, CA 95812-0100
   ATTN: STORM WATER PERMITTING SECTION
   IF YOU HAVE ANY QUESTIONS CALL WATER QUALITY CONTROL ENGINEER, CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, CENTRAL VALLEY REGION AT (916) 464-3291

24. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) ORDER AS MODIFIED BY NO. 2010-004-DWQ. THE CONTRACTOR SHALL IMPLEMENT AND MONITOR A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH THE SWRCB REGULATIONS.

25. BENCHMARK: CITY OF LODI BENCHMARK NUMBER 699
   ELEVATION: 56.50 (NAVD 88)
   DESCRIPTION: BRASS DISK 3.2' S/ CL OF CURB RETURN, TOP OF CURB.
   LOCATION: SW CORNER OF TURNER ROAD AND N SACRAMENTO STREET.

26. DEVELOPER SHALL, AT ITS OWN EXPENSE, HIRE A GEOTECHNICAL ENGINEER TO OVERSEE AND TEST THE COMPACTION EFFORTS OF THE JOINT TRENCH FOR THE PROJECT. A FINAL COMPACTION REPORT SHALL BE STAMPED AND SIGNED BY THE GEOTECHNICAL ENGINEER AND SUBMITTED TO THE CITY PRIOR TO THE FINAL INSPECTION.

27. ONE DENSITY AND WATER CONTENT TEST SHALL BE PERFORMED FOR EVERY 6- TO12-INCH THICK COMPACTED LIFT FOR EVERY 50 TO 100 LINEAR FEET OF UTILITY TRENCH BACKFILL. IF COMPACTION TESTS WITH A NUCLEAR GAUGE ARE NOT ABLE TO BE PERFORMED DUE TO THE PRESENCE OF SHALLOW UTILITY LINES OR BACKFILL, THEN FULL-TIME OBSERVATION OF THE JOINT UTILITY TRENCH BACKFILL OPERATION SHALL BE PERFORMED BY THE TESTING AGENCY. COMPACTION OF THE UTILITY TRENCH BACKFILL SHALL BE BY MECHANICAL MEANS SUCH AS BY A WHACKER, VIBRAPLATE, POGO STICK, OR SIMILAR TYPE OF EQUIPMENT. BACKFILL SHALL BE PLACED IN LOOSE LIFTS NO THICKER THAN 8 INCHES. EACH LIFT OF COMPACTED BACKFILL SHALL BE TESTED, EVALUATED, AND REWORKED, AS NECESSARY, UNTIL APPROVED BY THE TESTING AGENCY PRIOR TO PLACEMENT OF ADDITIONAL LIFTS. SHOULD THE RESULTS OF THE IN-PLACE DENSITY TESTS INDICATE THE SPECIFIED COMPACTION REQUIREMENTS HAVE NOT BEEN MET, THE AREA REPRESENTED BY THE TEST SHALL BE REWORKED AND RETESTED AS REQUIRED UNTIL THE SPECIFIED RELATIVE COMPACTION REQUIREMENTS ARE ACHIEVED.

GRADING NOTES:

1. EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY OF LODI CONSTRUCTION SPECIFICATIONS. ALL FILL AREAS SHALL BE TESTED AS REQUIRED BY THE CITY OF LODI AND SHALL BE PAID FOR BY THE CONTRACTOR.

2. THE CITY SHALL NOT BE RESPONSIBLE FOR COST OF INITIAL TEST FOR MOISTURE DENSITY CURVE. IF THE FIRST TEST FAILS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COST OF ALL SUBSEQUENT CURVES AND TESTS.

3. THE CONTRACTOR SHALL REVIEW SITE PRIOR TO BIDDING. ALL VEGETATION AND DELETERIOUS MATERIALS, INCLUDING ROOTS (SEE SOILS REPORT) SHALL BE REMOVED FROM THE SITE AT THE EXPENSE OF THE CONTRACTOR AND SHALL BE INCLUDED IN THE LUMP SUM CLEARING COST.

4. THE CONTRACTOR SHALL PRESERVE ALL STAKES AND POINTS SET FOR LINES, GRADES OR MEASUREMENT OF THE WORK IN THEIR PROPER PLACES UNTIL AUTHORIZED TO REMOVE THEM BY THE ENGINEER. ALL EXPENSES INCURRED IN REPLACING STAKES THAT HAVE BEEN REMOVED WITHOUT PROPER AUTHORITY SHALL BE PAID FOR BY THE GENERAL CONTRACTOR.

5. ALL EXISTING WELLS AND SEPTIC TANKS SHALL BE REMOVED AND/OR ABANDONED PER THE REQUIREMENTS OF THE SAN JOAQUIN LOCAL HEALTH DISTRICT AND THE CITY OF LODI. THIS WORK SHALL BE INCLUDED IN THE LUMP SUM CLEARING COST.

6. PERFORM SUBGRADE COMPACTION PRIOR TO FILL PLACEMENT, FOLLOWING CUTTING OPERATIONS, AND IN AREAS LEFT AT GRADE AS FOLLOWS:
   A.) SCARIFY TO A DEPTH OF AT LEAST 12 INCHES.
   B.) MOISTURE CONDITION SOIL TO AT LEAST 2 PERCENTAGE POINTS ABOVE THE OPTIMUM MOISTURE CONTENT
   C.) COMPACT THE SUBGRADE TO AT LEAST 90 PERCENT RELATIVE COMPACTION. COMPACT THE UPPER 12 INCHES OF FINISH PAVEMENT SUBGRADE TO AT LEAST 95 PERCENT RELATIVE COMPACTION PRIOR TO AGGREGATE BASE PLACEMENT.

STORM DRAIN NOTES:

1. ALL STORM DRAIN CONSTRUCTION, MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF LODI PUBLIC IMPROVEMENT DESIGN STANDARDS, CONSTRUCTION SPECIFICATIONS AND STANDARD PLANS.
   A.) PVC -ASTM D3034 SDR 35
   B.) REINFORCED CONCRETE PIPE - ASTM C76

2. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAG MEN OR OTHER DEVICES NECESSARY FOR PUBLIC SAFETY.

3. THE CONTRACTOR SHALL PROVIDE ALL SHORING, BRACING, SLOPING OR OTHER PROVISIONS NECESSARY TO PROTECT WORKMAN FOR ALL AREAS TO BE EXCAVATED TO A DEPTH OF 5 FEET OR MORE. SAID PROTECTION TO BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF LODI DEPARTMENT OF PUBLIC WORKS, AND STATE REGULATIONS.

4. ALL MANHOLE RIMS TO BE ADJUSTED TO FINISH GRADE AFTER STREET PAVING, UNLESS OTHERWISE NOTED. COST FOR RAISING FACILITIES TO BE INCLUDED IN UNIT PRICES FOR MANHOLES.

5. THE CONTRACTOR SHALL EXPOSE ALL EXISTING STORM DRAIN PIPES, WHERE A CONNECTION IS TO BE MADE, AND NOTIFY THE ENGINEER IF THERE IS A DISCREPANCY BETWEEN THE SIGNED PLANS AND THE EXISTING FIELD CONDITION PRIOR TO THE START OF CONSTRUCTION.

6. CONTRACTOR TO BE RESPONSIBLE FOR ALL TESTING OF STORM DRAIN FACILITIES IN ACCORDANCE WITH THE CITY OF LODI PUBLIC IMPROVEMENT DESIGN STANDARDS, CONSTRUCTION SPECIFICATIONS AND STANDARD PLANS.

7. ALL STORM DRAIN LINES SHALL BE CLEANED OF ALL SAND AND DEBRIS PRIOR TO ACCEPTANCE BY THE CITY OF LODI.

8. ALL STORM DRAIN INLETS SHALL BE LABELED "NO DUMPING-DRAINS TO RIVER" USING THERMOPLASTIC STENCILS AS PER STD PLAN 307.

SANITARY SEWER NOTES:

1. ALL SANITARY SEWER CONSTRUCTION, MATERIALS, AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF LODI PUBLIC IMPROVEMENT DESIGN STANDARDS, CONSTRUCTION SPECIFICATIONS AND STANDARD PLANS.
   A.) PVC SEWER PIPE & FITTINGS - ASTM D3034 SDR35, F-679, PS 46, DUCTILE IRON PIPE - ASTM A746
   B.) PVC LATERALS: ASTM D3034 SDR 35, DUCTILE IRON PIPE - ASTM D1869

2. THE CONTRACTOR SHALL PROVIDE ALL SHORING, BRACING, SLOPING OR OTHER PROVISIONS NECESSARY TO PROTECT WORKMEN FOR ALL AREAS TO BE EXCAVATED TO A DEPTH OF 5' OR MORE. SAID PROTECTION TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF LODI DEPARTMENT OF PUBLIC WORKS, AND STATE REGULATIONS.

3. THE CONTRACTOR SHALL EXPOSE ALL EXISTING SANITARY SEWER PIPES WHERE CONNECTION IS TO BE MADE, SO THAT THE ENGINEER CAN VERIFY EXISTING FLOW LINES AND LOCATIONS BEFORE START OF CONSTRUCTION.

4. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAG MEN, OR OTHER DEVICES NECESSARY FOR PUBLIC SAFETY.

5. ALL SANITARY SEWER LATERALS SHALL BE EXTENDED TO 12" MIN - 24" MAX. PAST THE PROPERTY LINE (AS DIMENSIONED ON "LOT UTILITY LAYOUT" DETAIL) AND PLUGGED (SEE STD. PLAN 507).

6. ALL TESTING REQUIRED BY THE CITY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, INCLUDING THE TELEVISING OF ALL SEWER LINES.

7. MANHOLE CASTINGS AND COVERS SHALL BE ADJUSTED TO FINISH GRADES BY THE PAVING CONTRACTOR AFTER STREET IMPROVEMENTS ARE COMPLETED. COST FOR ADJUSTING FACILITIES TO BE INCLUDED IN THE UNIT PRICE FOR MANHOLES AND CLEANOUTS.

8. CONTRACTOR SHALL INSTALL A "TRACE WIRE" ON ALL FORCE MAINS.

WATER NOTES:

1. ALL WATER CONSTRUCTION, MATERIALS, AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF LODI PUBLIC IMPROVEMENT DESIGN STANDARDS, CONSTRUCTION SPECIFICATIONS AND STANDARD PLANS.
   A.) PVC - AWWA C900, DR18 (CLASS 150)

2. THE CONTRACTOR SHALL EXPOSE EXISTING WATER LINES TO VERIFY EXISTING ELEVATION AND LOCATION PRIOR TO START OF CONSTRUCTION.

3. ALL WATER LINES SHALL BE TESTED AND DISINFECTED IN CONFORMANCE WITH THE REQUIREMENTS OF THE CITY OF LODI AND THE AMERICAN WATER WORKS ASSOCIATION (AWWA) STANDARDS, SECTION C-651. WATER LINE TESTING SHALL INCLUDE: HYDROSTATIC PRESSURE TESTING PER CITY OF LODI CONSTRUCTION SPECIFICATIONS AND BACTERIOLOGICAL TEST PER CITY OF LODI CONSTRUCTION SPECIFICATION SECTION AND AWWA C651. AFTER FINAL FLUSHING AND BEFORE THE NEW WATER MAIN IS CONNECTED TO THE DISTRIBUTION SYSTEM, TWO CONSECUTIVE SETS OF ACCEPTABLE SAMPLES, TAKEN 24 HOURS APART, SHALL BE COLLECTED FROM THE NEW MAIN. SAMPLES SHALL BE COLLECTED AT SITES AS DIRECTED BY CITY. (AT LEAST ONE SET OF SAMPLES SHALL BE COLLECTED EVERY 1000 FEET OF THE NEW WATER MAIN, PLUS ONE SET FROM EACH END OF THE LINE AND AT LEAST ONE SET FROM EACH BRANCH). ALL SAMPLES SHALL BE TESTED FOR BACTERIOLOGICAL QUALITY, AND SHALL SHOW THE ABSENCE OF COLOFORM ORGANISMS. A STANDARD HETEROTROPHIC PLATE COUNT MAY BE REQUIRED AT THE OPTION OF THE CITY ENGINEER. SAMPLES SHALL BE TAKEN FROM WATER THAT HAS STOOD IN THE NEW MAIN FOR AT LEAST 24 HOURS AFTER FINAL FLUSHING HAS BEEN COMPLETED. IF THE INITIAL DISINFECTION FAILS TO PRODUCE SATISFACTORY BACTERIOLOGICAL SAMPLES, THE MAIN SHALL BE REFLUSHED AND RESAMPLED DAILY FROM THE SAME POINT(S) UNTIL TWO CONSECUTIVE SAMPLES ARE NEGATIVE FOR COLOFORM ORGANISMS. THE CITY OF LODI SHALL PAY FOR THE INITIAL BACTERIOLOGICAL TESTS. THE CONTRACTOR SHALL PAY FOR ALL TESTING NECESSITATED BY FAILURE OF THE INITIAL TEST(S). IF TRENCH WATER HAS ENTERED THE NEW MAIN DURING CONSTRUCTION OR, IF IN THE OPINION OF THE CITY OF LODI, EXCESSIVE QUANTITIES OF DIRT OR DEBRIS HAVE ENTERED THE NEW MAIN, BACTERIOLOGICAL SAMPLES SHALL BE TAKEN AT INTERVALS OF APPROXIMATELY 200 FEET AND SHALL BE IDENTIFIED BY LOCATION. THE CONTRACTOR SHALL INSTALL ADDITIONAL WATER SERVICE TAPS AND SAMPLING STATIONS AS REQUIRED. THE CONTRACTOR SHALL ALSO REMOVE SAMPLING STATIONS AND SERVICES UPON SATISFACTORY COMPLETION OF TESTING. THE CONTRACTOR SHALL PAY FOR TESTING OF THE CONTAMINATED AREAS. CONTRACT PRICE SHALL INCLUDE FULL COMPENSATION FOR FURNISHING ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, AND INCIDENTALS, AND FOR DOING ALL OF THE WORK INVOLVED IN TESTING AND DISINFECT ION OF THE WATER MAINS.

4. CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAG MEN, OR OTHER DEVICES NECESSARY FOR PUBLIC SAFETY.

5. WATER LINES SHALL BE A MINIMUM OF 10 FEET OUTSIDE OF PIPE TO OUTSIDE OF PIPE FROM SEWER MAINS. CROSSINGS SHALL MEET STATE HEALTH STANDARDS.

6. ALL VALVE BOXES TO BE ADJUSTED TO FINISH GRADE AFTER STREET PAVING. COST FOR RAISING FACILITIES TO BE INCLUDED IN UNIT PRICES FOR VALVES.

7. THE CONTRACTOR SHALL PROVIDE ALL SHORING, BRACING, SLOPING OR OTHER PROVISIONS NECESSARY TO PROTECT WORKMEN FOR ALL AREAS TO BE EXCAVATED TO A DEPTH OF 5' OR MORE. SAID PROTECTION TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF LODI DEPARTMENT OF PUBLIC WORKS, AND STATE REGULATIONS.

8. ALL CONNECTIONS TO EXISTING CITY FACILITIES SHALL BE MADE IN THE PRESENCE OF THE CITY ENGINEER, OR HIS APPOINTED REPRESENTATIVE.

9. REQUESTS FOR CITY VALVE OPERATIONS SHALL BE MADE PER THE CITY OF LODI CONSTRUCTION SPECIFICATIONS.

10. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COST OF REPAIRING ANY DAMAGE TO THE SYSTEM UNTIL ACCEPTANCE BY THE CITY COUNCIL.

POLLUTION AND DUST CONTROL:

PRIOR TO ISSUANCE OF BUILDING PERMITS FOR PROJECT, APPLICANT/CONTRACTOR SHALL DEMONSTRATE COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT (SJVAPCD) REGULATION VIII & MUST OBTAIN AN APPROVED DUST CONTROL PLAN.

1. THE CONTRACTOR SHALL PROVIDE EVIDENCE OF COMPLIANCE WITH THE SAN JOAQUIN VALLEY AIR POLLUTION DISTRICT (SJVAPCD) REGULATIONS AND REQUIREMENTS (FUGITIVE PM 10, IRS ETC.)

2. THE CONTRACTOR SHALL KEEP THE WORK SITE FREE AND CLEAR OF RUBBISH AND DEBRIS.

3. THE CONTRACTOR SHALL EXERCISE CARE TO PRESERVE AND PROTECT NATURAL HABITAT ADJACENT TO THE PROJECT SITE.

4. THE CONTRACTOR SHALL NOT DISCHARGE SMOKE, DUST, OR ANY OTHER AIR CONTAMINANTS INTO THE ATMOSPHERE IN SUCH A QUANTITY AS WILL VIOLATE THE REGULATIONS OF ANY LEGALLY CONSTITUTED AUTHORITY.

5. THE CONTRACTOR SHALL KEEP ALL AREAS GENERATING DUST WITHIN THE LIMITS OF THE PROJECT WELL WATERED DURING THE TERM OF THIS CONTRACT. THIS INCLUDES BUT IS NOT LIMITED TO ACCESS RAMPS, THE HAUL ROADS, THE EMBANKMENT FILL AREA, AND ANY OTHER AREAS THAT MAY GENERATE DUST AS A RESULT OF CONTRACTOR'S OPERATIONS. THE CONTRACTOR SHALL PROVIDE DUST CONTROL MEASURES DURING EVENINGS, WEEKENDS, AND HOLIDAYS WHEN REQUESTED BY THE DISTRICT AT NO ADDITIONAL COST TO THE DISTRICT.

6. THE CONTRACTOR(S) SHALL KEEP ALL PUBLIC ROADWAYS ADJACENT TO THE PROJECT SITE FREE AND CLEAR OF MUD AND SILT DURING THE TERM OF THIS CONTRACT. THIS INCLUDES MUD CAUSED BY RAIN OR BY THE CONTRACTOR(S) WATERING PROCEDURES FOR DUST CONTROL.

7. THROUGHOUT ALL PHASES OF CONSTRUCTION, INCLUDING SUSPENSION OF WORK, AND UNTIL FINAL ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL KEEP THE PREMISES OCCUPIED BY HIM IN A CLEAN AND ORDERLY CONDITION, DISPOSING OF REFUSE AND LITTER IN A MANNER SATISFACTORY TO THE CITY OF LODI.

CITY OF LODI GENERAL NOTES:

1. WORK SHALL CONFORM TO CITY OF LODI PUBLIC IMPROVEMENT DESIGN STANDARDS. CONSTRUCTION SPECIFICATIONS AND STANDARD PLANS UNLESS SPECIFICALLY SHOW OTHERWISE ON THESE PLANS.

2. STANDARD PLANS APPLICABLE TO THIS PROJECT INCLUDE: 123, 132A, 132B, 132E, 135, 301, 304, 309, 310, 314, 402, 405, 408, 409, 413, 501A, 501B, 501C, 506

3. CONSTRUCTION STAKING FOR CURB AND GUTTER, WASTE WATER LINES, STORM DRAINS WATER LINES, STREET CENTERLINES, PAVING EDGES AND OTHER PUBLIC FACILITIES AS DIRECTED BY THE CITY SHALL BE DONE BY A REGISTERED CIVIL ENGINEER OR LICENSED LAND SURVEYOR.

4. CENTERLINE AND PROPERTY LINE DATA SHALL BE OBTAINED FROM THE PLAT AND LEGAL FOR THIS PROJECT.

5. EXISTING UNDERGROUND UTILITIES SHALL BE PROTECTED. UTILITY AGENCIES SHALL BE NOTIFIED AND ALLOWED TO MARK THEIR UTILITIES IN THE FIELD AT LEAST 48 HOURS BEFORE EXCAVATION. COMPLETENESS AND ACCURACY OF EXISTING UTILITY LOCATIONS SHOWN IN THESE PLANS ARE NOT GUARANTEED. CALL "USA" (800) 227-2600.

6. STREET AND LOT ROUGH GRADING SHALL BE DONE BEFORE UNDERGROUND WORK.

7. UNDERGROUND UTILITIES IN THE STREET AND SIDEWALK AREA SHALL BE INSTALLED BEFORE CONSTRUCTION OF CURB, GUTTER OR SIDEWALK. THESE UTILITIES INCLUDE SERVICES, FIRE HYDRANT LATERALS, STREET LIGHT CONDUIT, ELECTRIC, GAS, CABLE TV AND TELEPHONE LINES.

8. EXCAVATION SAFETY REQUIREMENTS INCLUDE SUBMITTING A CAL OSHA PERMIT OR LETTER OF NOTIFICATION TO THE CITY BEFORE COMMENCING EXCAVATIONS OVER FIVE FEET DEEP. REFER TO CITY CONSTRUCTION SPECIFICATION 6-19.4 "EXCAVATION SAFETY" FOR ADDITIONAL REQUIREMENTS.

9. ALL TESTING FOR LEAKAGE OR OVER DEFLECTION SHALL BE WITNESSED BY A CITY INSPECTOR.

10. BALLING AND CLEANING OF STORM DRAIN AND SANITARY SEWERS SHALL BE DONE BEFORE INTERIOR VIDEO INSPECTION. UTILITIES SHALL BE KEPT CLEAN UNTIL CITY ACCEPTANCE.

11. STREET LIGHT SYSTEM SHOWN ON THESE PLANS IS FOR REFERENCE ONLY. THE SYSTEM SHALL BE INSTALLED ACCORDING TO CITY ELECTRIC UTILITY DEPARTMENT PLANS.

12. BENCH MARK MONUMENTS FURNISHED BY THE CITY SHALL BE INSTALLED AT LOCATIONS SHOWN OR AS DIRECTED BY THE CITY ENGINEER.

13. TV LOGS OF EXISTING MAINS WILL BE PREPARED BY THE CITY OF LODI UPON REQUEST OF THE CONTRACTOR PRIOR TO CONSTRUCTION. REPLACEMENT OF ANY UNDERGROUND MAINS DAMAGED DURING CONSTRUCTION OF THE PROJECT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

14. R-VALUE TESTS SHALL BE TAKEN AFTER GRADING TO VERIFY ADEQUACY OF STRUCTURAL SECTION. SECTIONS SHOWN ARE BASED ON THE R-VALUES SHOWN ON THE PLANS AND ARE FOR BIDDING PURPOSES ONLY.

15. A PRE-CONSTRUCTION MEETING SHALL BE SCHEDULED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER, CITY INSPECTOR AND ALL UTILITY AGENCIES AT LEAST ONE WEEK PRIOR TO THE DATE OF THE MEETING. THE CONTRACTOR'S JOB SUPERINTENDENT AND ALL MAJOR SUB-CONTRACTORS SHALL ATTEND.

16. BEDDING FOR ALL PIPE LINES SHALL CONFORM TO CITY OF LODI STANDARD PLAN 501-A, 501-B AND 501-C UNLESS OTHERWISE SHOWN.

17. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY FOR OIL PERSONS AND PROPERTY; THAT HIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.

18. WATER USED IN ANY PHASE OF CONSTRUCTION, SUCH AS BACKFILL COMPACTION, DUST CONTROL, TESTING OR OTHER WORK HEREIN REQUIRED, SHALL BE INCLUDED IN THE UNIT PRICE OR LUMP SUM BID FOR THE RESPECTIVE ITEM OF CONSTRUCTION OR ITEMS OF WORK.

19. AC MIX DESIGN SHALL BE SUBMITTED BY THE CONTRACTOR TO THE CITY FOR APPROVAL AT LEAST 30 DAYS BEFORE PAVING.

20. PROJECT SURVEYOR SHALL SET ALL SURVEY CONTROLS AND CONSTRUCTION STAKES AS NECESSARY FOR COMPLETION OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PRESERVATION OF ALL SURVEY AND CONSTRUCTION STAKES. SURVEY AND CONSTRUCTION STAKES THAT ARE LOST OR DESTROYED DUE TO CONTRACTOR'S NEGLIGENCE WILL BE SET BY THE PROJECT SURVEYOR AT THE CONTRACTORS EXPENSE.

21. CONTRACTOR SHALL GIVE ENGINEER A MINIMUM OF 48 HOURS NOTICE WHEN REQUESTING CONSTRUCTION STAKING.

22. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO KEEP DUST TO A MINIMUM COST TO BE INCLUDED IN OTHER ITEMS OF WORK.

23. CONTRACTOR SHALL SUPPLY AND INSTALL STREET SIGN POSTS AND STREET NAME SIGNS, REGULATORY SIGNS PER STANDARD PLAN NO.119 AND 142 AND AS NOTED ON PLANS. CONTRACTOR TO CONTACT PUBLIC WORKS INSPECTOR FOR STREET BLOCK NUMBERS.

24. REMOVAL OF PAVEMENT AT ENDS OF EXISTING STREETS TO PROVIDE PROPERTY TRANSITIONS MAY BE REQUIRED IN EXCESS OF 2 FEET AS DIRECTED BY CITY IMMEDIATELY PRIOR TO PAVING.

25. TRAFFIC CONTROL PER CALTRANS TRAFFIC CONTROL MANUAL (LATEST EDITION). NO OPEN TRENCHES EXCEPT AT THE TIME OF WORK. USE STEEL PLATES OR BACKFILL WITH A.C. CAP.

26. A PROJECT IDENTIFICATION SIGN SHALL BE INSTALLED AS SHOWN ON THE PLANS, PRIOR TO GRADING. SEE SHEET 15 FOR LOCATION.

27. CONTRACTOR IS TO VERIFY THE DEPTH AND/OR LOCATION IN THE FIELD OF ALL EXISTING UTILITIES BEFORE THE START OF CONSTRUCTION.

28. STREET PAVING: THE FINAL COMPACTED MIXTURE SHALL BE A MINIMUM OF 93% RELATIVE TO MAXIMUM THEORETICAL SPECIFIC GRAVITY (ATSM-D-2041 RICE SPECIFIC GRAVITY); IF COMPACTION LS BETWEEN 90 & 93% THEN THE CITY OF LODI SHALL BE COMPENSATED FOR THE FUTURE INCREASED MAINTENANCE CASTS. IF COMPACTION IS 89.9% OR LESS THE ASPHALT SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE CITY ENGINEER.

29. THE DEVELOPER IS RESPONSIBLE FOR REPLACEMENT OF MISSING AND DAMAGED FILTER SCREENS UNTIL ONE YEAR AFTER THE SUBDIVISION/PROJECT IS ACCEPTED. A ROUTINE MAINTENANCE SCHEDULE IS TO BE MALNTALNED. FILTER SCREENS SHALL BE SECURED TO THE CATCH BASINS DURING THIS PERIOD.

30. ADDITIONAL R-VALUE TESTS SHALL BE TAKEN AFTER CONSTRUCTION OF UNDERGROUND AS REQUIRED BY THE PUBLIC WORKS INSPECTOR DUE TO INCONSISTENCIES IN THE SOIL TYPES, TO VERIFY ADEQUACY OF STRUCTURAL SECTIONS SHOWN AN THE PLANS.

31. IT IS THE RESPONSIBILITY OF THE PROPERTY OWNER /DEVELOPER TO DETERMINE IF A NPDES PERMIT FOR DISCHARGE OF STORM WATER RUNOFF IS REQUIRED AND TO OBTAIN COVERAGE PRIOR TO CONSTRUCTION. INFORMATION REGARDING REQUIREMENTS AND APPLICATION PROCEDURE CAN BE OBTAINED FROM THE REGIONAL WATER CONTROL BOARD, CENTRAL VALLEY REGION AT (916) 255-3000.

32. HANDICAP RAMPS WILL BE CONSTRUCTED TYPE-V PER A.D.A., "WITH NO LIP". STANDARD PLAN 132. A,B,C & D.

33. TRAFFIC FLOW AND ACCESS ENTRYWAY SHALL NOT BE OBSTRUCTED AT ANY TIME.

34. WASTE WATER GENERATED BY CONCRETE WORK TO BE CAPTURED AND VACUUMED PRIOR TO ENTERING CITY STORM DRAIN SYSTEM.

35. THE CONTRACTOR SHALL PERFORM AT HIS EXPENSE ALL TESTS SPECIFIED OR REQUIRED BY THE CITY OF LODI QUALITY ASSURANCE PROGRAM TO ASSURE THAT CONSTRUCTION PROJECTS ARE IN CONFORMANCE WITH THE CITY OF LODI CONSTRUCTION SPECIFICATIONS. THE CONTRACTOR SHALL FURNISH ALL FACILITIES, LABOR AND MATERIALS REASONABLY REQUIRED FOR PERFORMING SAFE AND CONVENIENT TESTS AS ARE REQUIRED BY THE QUALITY ASSURANCE PROGRAM AND CONSTRUCTION SPECIFICATIONS; RESULTS OF THE TESTING PROCEDURES WILL BE PRESENTED TO THE CITY OF LODI PUBLIC WORKS INSPECTOR IN A TIMELY FASHION SO AS NOT TO DELAY THE CONTINUATION OF WORK. ANY SUCH DELAY SHALL SOLELY BE THE RESPONSIBILITY OF THE CONTRACTOR. ALL COMPLETION OF CONSTRUCTION, A FINAL REPORT CONTAINING ALL TEST RESULTS PRESENTED IN AN ORDERLY MANNER SHALL BE PROVIDED PRIOR TO FINAL ACCEPTANCE OF THE PROJECT. A COPY OF THE QUALITY ASSURANCE PROGRAM IS ON FILE IN THE CITY OF LODI PUBLIC WORKS DEPARTMENT.

36. THE CONTRACTOR MAY, AT HIS OWN EXPENSE, CONDUCT TELEVIDEO INSPECTION OF THE STORM DRAIN AND SANITARY SEWER LINES. THE CONTRACTOR SHALL PROVIDE THE PUBLIC WORKS DEPARTMENT WITH A COPY OF THE VIDEO AND REPORT, IN A FORM ACCEPTABLE TO THE PUBLIC WORKS DEPARTMENT, FOR REVIEW AND APPROVAL PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.

37. STREETS ADJACENT TO THE PROJECT SITE SHALL BE SWEPT AS NEEDED TO REMOVE SILT WHICH MAY HAVE ACCUMULATED FROM CONSTRUCTION ACTIVITIES.

38. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FINISH WORK DUE TO DISRUPTION OF PAVEMENT AT THE COMPLETION OF SOILS ENGINEERS COMPACTION TESTING FOR NEW PAVING/STREETS.

39. AC MIX DESIGN SHALL HAVE BEEN COMPLETED WITHIN SIX MONTHS OF SUBMITTAL TO THE CITY OF LODI. THE AC MIX DESIGN SHALL INDICATE THE PERCENTAGE PASSING EACH SIEVE SIZE, PERCENT ASPHALT RECOMMENDED, PERCENT VOIDS, STABILITY AND MAXIMUM THEORETICAL UNIT WEIGHT AT EACH ASPHALT CONTENT USED TO ARRIVE AT THE RECOMMENDED OPTIMUM BULLMEN CONTENT (OBC). THE OBC SHALL BE SELECTED TO MEET ALL THE REQUIREMENTS OF SECTION 39 AND PRODUCE AIR VOIDS IN THE COMPACTED MIXTURE AT 3 TO 5%.

40. THE CONTRACTOR SHALL SUBMIT A MIX DESIGN FOR APPROVAL 30 DAYS PRIOR TO PAVING. THE CONTRACTOR SHALL ALSO FURNISH WITH THE ASPHALT CONCRETE MIX DESIGN A LIST OF HIS SOURCES OF MATERIALS TOGETHER WITH A CERTIFICATE OF COMPLIANCE, INDICATING THAT MATERIALS TO BE INCORPORATED IN THE WORK FULFILL THE REQUIREMENTS OF THESE SPECIFICATIONS. THE CERTIFICATE OF COMPLIANCE SHALL BE SIGNED BY THE MATERIAL SUPPLIER OR HIS REPRESENTATIVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE REQUIRED ASPHALT CONCRETE MIX DESIGN.

41. UTILITY PIPE HORIZONTAL AND VERTICAL CLEARANCES SHALL COMPLY WITH STATE HEALTH STANDARDS AND CITY OF LODI STANDARD PLANS 415 A-B.

42. CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM SAN JOAQUIN COUNTY FOR ANY TEMPORARY OR PERMANENT WORK TO BE DONE IN COUNTY RIGHT-OF-WAY.

43. DEVELOPER SHALL, AT ITS OWN EXPENSE, HIRE A GEOTECHNICAL ENGINEER TO OVERSEE AND TEST THE COMPACTION EFFORTS OF THE JOINT TRENCH FOR THE PROJECT. A FINAL COMPACTION REPORT SHALL BE STAMPED AND SIGNED BY THE GEOTECHNICAL ENGINEER AND SUBMITTED TO THE CITY PRIOR TO THE FINAL INSPECTION.

44. ONE DENSITY AND WATER CONTENT TEST SHALL BE PERFORMED FOR EVERY 6- TO12-INCH THICK COMPACTED LIFT FOR EVERY 50 TO 100 LINEAR FEET OF UTILITY TRENCH BACKFILL. IF COMPACTION TESTS WITH A NUCLEAR GAUGE ARE NOT ABLE TO BE PERFORMED DUE TO THE PRESENCE OF SHALLOW UTILITY LINES OR BACKFILL, THEN FULL-TIME OBSERVATION OF THE JOINT UTILITY TRENCH BACKFILL OPERATION SHALL BE PERFORMED BY THE TESTING AGENCY. COMPACTION OF THE UTILITY TRENCH BACKFILL SHALL BE BY MECHANICAL MEANS SUCH AS BY A WHACKER, VIBRAPLATE, POGO STICK, OR SIMILAR TYPE OF EQUIPMENT. BACKFILL SHALL BE PLACED IN LOOSE LIFTS NO THICKER THAN 8 INCHES. EACH LIFT OF COMPACTED BACKFILL SHALL BE TESTED, EVALUATED, AND REWORKED, AS NECESSARY, UNTIL APPROVED BY THE TESTING AGENCY PRIOR TO PLACEMENT OF ADDITIONAL LIFTS. SHOULD THE RESULTS OF THE IN-PLACE DENSITY TESTS INDICATE THE SPECIFIED COMPACTION REQUIREMENTS HAVE NOT BEEN MET, THE AREA REPRESENTED BY THE TEST SHALL BE REWORKED AND RETESTED AS REQUIRED UNTIL THE SPECIFIED RELATIVE COMPACTION REQUIREMENTS ARE ACHIEVED.

REQUIRED CONTRACTOR SUBMITTALS:

1. ASPHALT MIX DESIGN
2. PIPE MATERIALS AND TRENCH SECTION TO BE USED (WHEN ALTERNATIVES ARE ALLOWED)
3. ANY OTHER ITEM OF WORK WHERE ALTERNATIVES ARE ALLOWED OR THE CONTRACTOR WISHES TO DO THE WORK IN A FASHION OTHER THAN AS SHOWN ON THE PLANS OR AS REQUIRED BY THE CITY.
4. TRAFFIC CONTROL PLANS TO BE APPROVED BY THE CITY TRAFFIC ENGINEER.
5. ELECTRICAL & MECHANICAL EQUIPMENT.

SURVEY MONUMENT PRESERVATION NOTES:

1. ALL EXISTING SURVEY MONUMENTS ARE TO BE PRESERVED PER CALIFORNIA SENATE BILL 1467.

2. AS REQUIRED BY THE PROFFESSIONAL LAND SURVEYORS' ACT (BUISINESS AND PROFESSIONALS CODE §§ 8700-8805) SECTION 8771; PRIOR TO THE START OF CONSTRUCTION, ALL SURVEY MONUMENTS, WITHIN THE PROJECT LIMITS THAT HAVE THE POSSIBILITY OF BEING DAMAGED OR DESTROYED DURING CONSTRUCTION, MUST BE LOCATED AND REFERENCED BY A LICENSED LAND SURVEYOR. IF ANY OF THESE SURVEY MONUMENTS ARE DESTROYED, DAMAGED, OR COVERED OVER DURING THE COURSE OF CONSTRUCTION, A NEW MONUMENT AND MONUMENT BOX MUST THEN BE SET IN ITS PLACE, AT THE ORIGINAL LOCATION, BY A LECENSED LAND SURVEYOR, AND ANOTHER CORNER RECORD OR RECORD OF SURVEY FILED WITH THE COUNTY SURVEYOR.

JOINT TRENCH NOTES:

DEVELOPER SHALL, AT ITS OWN EXPENSE, HIRE A GEOTECHNICAL ENGINEER TO OVERSEE AND TEST THE COMPACTION EFFORTS OF THE JOINT TRENCH FOR THE PROJECT. A FINAL COMPACTION SHALL BE STAMPED AND SIGNED BY THE GEOTECHNICAL ENGINEER AND SUBMITTED TO THE CITY PRIOR TO THE FINAL INSPECTION.

ONE DENSITY AND WATER CONTENT SHALL BE PERFORMED FOR EVERY 6 TO 12 INCH THICK COMPACTED LIFT FOR EVERY 50 TO 100 LINEAR FEET OF UTILITY TRENCH BACKFILL. IF COMPACTION TESTS WITH A NUCLEAR GAUGE ARE NOT ABLE TO BE PERFORMED DUE TO THE PRESENCE OF SHALLOW UTILITY LINES OR BACKFILL, THEN FULL-TIME OBSERVATION OF THE JOINT UTILITY TRENCH BACKFILL OPERATION SHALL BE PERFORMED BY THE TESTING AGENCY. COMPACTION OF THE UTILITY TRENCH BACKFILL SHALL BE BY MECHANICAL MEANS SUCH AS BY A WHACKER, VIBRAPLATE, POGO STICK, OR SIMILAR TYPE OF EQUIPMENT. BACKFILL SHALL BE PLACED IN LOOSE LIFTS NOT THICKER THAN 8 INCHES. EACH LIFT OF COMPACTED BACKFILL SHALL BE TESTED, EVALUATED, AND REWORKED, AS NECESSARY, UNTIL APPROVED BY THE TESTING AGENCY PRIOR TO PLACEMENT OF ADDITIONAL LIFTS. SHOULD THE RESULTS OF THE IN-PLACE DENSITY TESTS INDICATE THE SPECIFIED COMPACTION REQUIREMENTS HAVE NOT BEEN MET, THE AREA REPRESENTED BY THE TEST SHALL BE REWORKED AND RETESTED AS REQUIRED UNTIL THE SPECIFIED RELATIVE COMPACTION REQUIREMENTS ARE ACHIEVED.

LEGEND

ITEM	EXISTING	PROPOSED
WATER VALVE		
AIR RELEASE VALVE		
BLOWOFF		
FIRE HYDRANT		
WATER METER	W	W
SEWER MANHOLE	S	S
STORM MANHOLE	SD	SD
DRAIN INLET		
CURB INLET		
CLEANOUT		
SEWER MANHOLE NUMBER	EX1	1
STORM MANHOLE NUMBER	EX1	1
WATER LINE	EX W	8"W
SANITARY SEWER	EX S	6"SS
STORM DRAIN	EX SD	12"SD
TYPICAL ELECTROLIER		
TYPICAL LUMINAIRE		
ELECTRICAL VAULT	E	E
SURVEY MONUMENT		
UTILITY POLE		
SIGNAGE		
ELEVATION	40.50TC 40.00P	40.50TC 40.00P
DIRECTION OF FLOW	2.00 %	2.00 %
ORIGINAL GROUND	× 40.59	N/A
BARBED WIRE FENCE		
WOOD FENCE		
RETAINING WALL		
MASONRY WALL		
CURB, GUTTER & SIDEWALK		
TYPICAL RETURN WITH HANDICAP RAMP		

WDID#

OFF-SITE IMPROVEMENTS PROPOSED PER PUBLIC IMPROVEMENT PLAN SET XXXXX

ABBREVIATION LIST

@	AT	NTS	NOT TO SCALE
AB	AGGREGATE BASE	OG	ORIGINAL GROUND / GRADE
AC	ASPHALT CONCRETE	(P)	PROPOSED
ADA	AMERICAN DISABILITIES ACT	P	PAVEMENT
BC	BEGINNING OF CURVE	P.A.E.	PRIVATE ACCESS EASEMENT
BDRY	BOUNDARY	PIV	POST INDICATOR VALVE
BSL	BUILDING SET BACKLINE	PL	PROPERTY LINE
BVC	BEGIN VERTICAL CURVE	PP	POWER POLE
BW	BOTTOM WALL	PRC	POINT OF REVERSE CURVATURE
C & G	CURB AND GUTTER	PT	POINT
CB	CATCH BASIN	PUE	PUBLIC UTILITY EASEMENT
CI	CURB INLET	PVC	POLYVINYL CHLORIDE PIPE
CIP	CAST IN PLACE PIPE	R	RADIUS
CL	CENTER LINE	RBW	RETAINING BOTTOM OF WALL
CO	CLEAN OUT	RCP	REINFORCED CONCRETE PIPE
CONC	CONCRETE	RET	RETURN
COL, C.O.L.	CITY OF LODI	RGRCP	RUBBER GASKET REINFORCED CONCRETE PIPE
CR	CURB RETURN	ROW/RW	RIGHT-OF-WAY
CRN	ROAD CROWN	RPA	REDUCED PRESSURE BACKFLOW ASSEMBLY
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY	RPBA	REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY
DIA	DIAMETER	RPDA	REDUCED PRESSURE DETECTOR ASSEMBLY
DIP	DUCTILE IRON PIPE	RPV	PRESSURE REDUCING VALVE
DO	DRIVE OVER	RTW	RETAINING TOP OF WALL
DW	DRIVEWAY	RWL	RAIN WATER LEADER
EC	END OF CURVE	S	SLOPE
EG	EXISTING GROUND	SCDA	SINGLE CHECK DETECTOR ASSEMBLY
ELEV	ELEVATION	SD	STORM DRAIN
EP	EDGE OF PAVEMENT	SHT	SHEET
ESMT	EASEMENT	SL	SECTION LINE
EVA	EMERGENCY VEHICLE ACCESS	SNS	STREET NAME SIGN
EVC	END OF VERTICAL CURVE	STA	STATION
EX, (EX), EXIST	EXISTING	STD	STANDARD
FDC	FIRE DEPARTMENT CONNECTION	SW / S/W	SIDEWALK
FG	FINISHED GRADE	SS	SANITARY SEWER
FH	FIRE HYDRANT	TB	THRUST BLOCK
FL	FLOW LINE	TC	TOP OF CURB
G	GROUND	TEMP	TEMPORARY
GB	GRADE BREAK	THRU	THROUGH
GW	GREASE WASTE	TI	TRAFFIC INDEX
HGL	HYDRAULIC GRADE LINE	TPE	TREE PLANTING EASEMENT
HP	HIGH POINT	TR	TRANSITION
INV	INVERT	TW	TOP OF WALL
IRR	IRRIGATION	TYP.	TYPICAL
IW	INDUSTRIAL WASTE	U.N.O.	UNLESS NOTED OTHERWISE
LF	LINEAL FEET OR LINEAR FEET	V	6" VERTICAL CURB
LP	LOW POINT	VM	4" VERTICAL CURB (MODIFIED)
LUSD	LODI UNIFIED SCHOOL DISTRICT	W	WATER
MAX	MAXIMUM	WS	WATER SERVICE
MH	MAINTENANCE HOLE		
MIN	MINIMUM		
MS4	MUNICIPAL SEPARATE STORM SEWER SYSTEM		

CIVIL SHEET INDEX

SHEET #	SHEET TITLE
C1.0.1	GENERAL NOTES & SPECIFICATIONS
C2.0.1	CONSTRUCTION DETAILS
C2.1.1	CONSTRUCTION DETAILS
C3.0.1	TOPOGRAPHIC SURVEY & DEMOLITION PLAN
C4.0.1	DIMENSIONING & PAVING PLAN SE
C4.1.1	DIMENSIONING & PAVING PLAN SW
C4.2.1	DIMENSIONING & PAVING PLAN NW
C4.3.1	DIMENSIONING & PAVING PLAN NE
C5.0.1	GRADING PLAN SE
C5.1.1	GRADING PLAN SW
C5.2.1	GRADING PLAN NW
C5.3.1	GRADING PLAN NE
C6.0.1	STORM DRAIN PLAN
C7.0.1	SEWER PLAN
C8.0.1	WATER & COMPOSITE UTILITY PLAN
C9.0.1	EROSION & SEDIMENT CONTROL PLAN

AGENCY APPROVAL:

± PLUS OR MINUS (NOT EXACT)

LODI USD

HMC Architects DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

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Δ	DESCRIPTION	DATE

KEYNOTES

NOTES

REGISTERED PROFESSIONAL ENGINEER MARSHALL T. SWIFT No. C87499 CIVIL STATE OF CALIFORNIA

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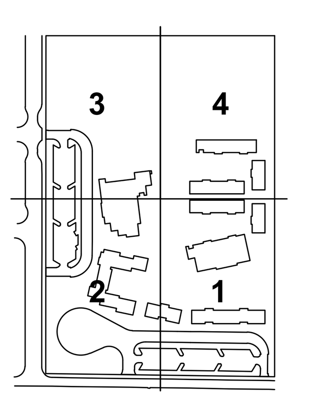
MANTECA , CA 95336
TEL : (209) 239 - 6229
FAX : (209) 239 - 8839

KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
GENERAL NOTES & SPECIFICATIONS

DSA SUBMITTAL

DATE: **12/09/2025** CLIENT PROJ NO:

SHEET:
C1.0.1

PLEASE RECYCLE
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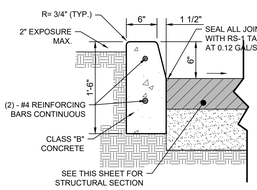
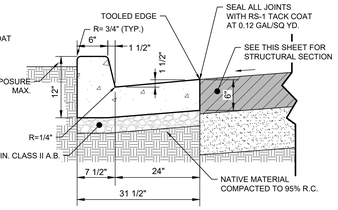
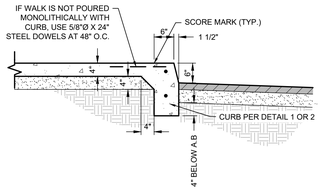
THE LINE BROKEN ABOVE IS EXACTLY 1" WHEN PLOTTED AT ANY SHEETS ORIGINAL IMAGE SIZE



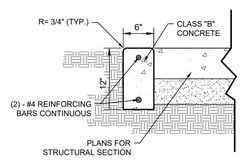
1 VERTICAL CURB
NOT TO SCALE



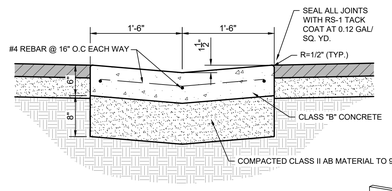
2 CURB & GUTTER
NOT TO SCALE



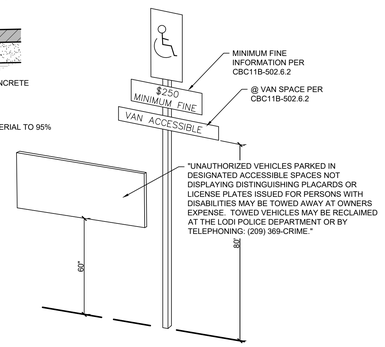
3 CURB & SIDEWALK
NOT TO SCALE



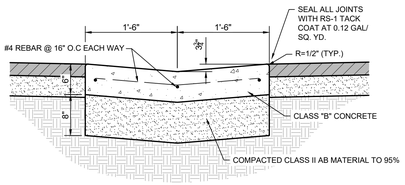
4 FLUSH CURB
NOT TO SCALE



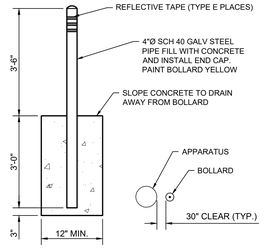
5 VALLEY GUTTER
NOT TO SCALE



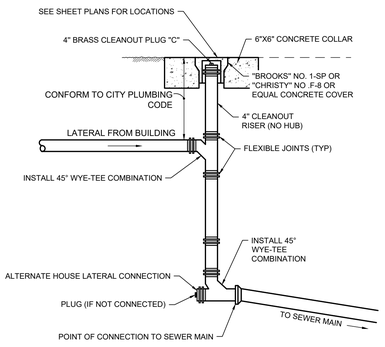
6 ACCESSIBLE PARKING SIGNAGE
NOT TO SCALE



7 ADA VALLEY GUTTER
NOT TO SCALE

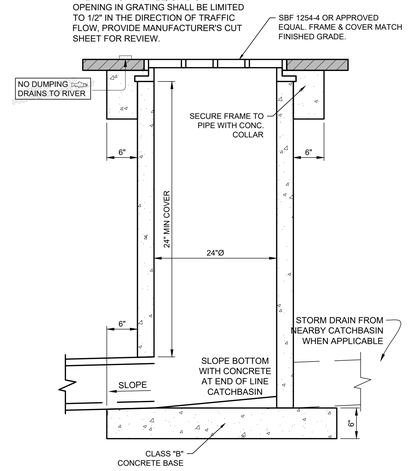


8 PROTECTIVE BOLLARD
NOT TO SCALE



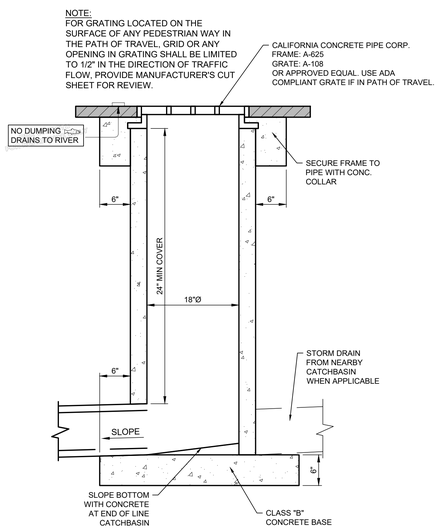
UT1 CLEAN-OUT
NOT TO SCALE

NOTE:
FOR GRATING LOCATED ON THE SURFACE OF ANY PEDESTRIAN WAY IN THE PATH OF TRAVEL, GRID OR ANY OPENING IN GRATING SHALL BE LIMITED TO 1/2" IN THE DIRECTION OF TRAFFIC FLOW, PROVIDE MANUFACTURER'S CUT SHEET FOR REVIEW.



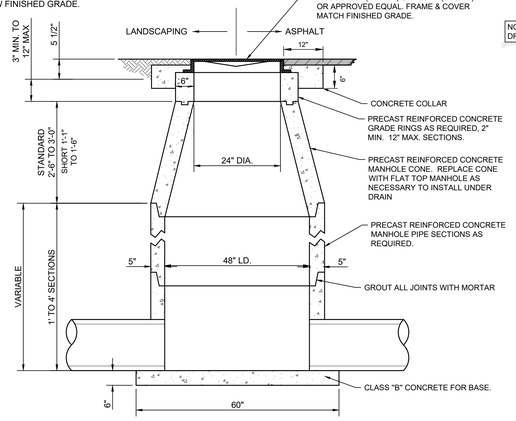
UT2 24"Ø STORM DRAIN CATCH BASIN
NOT TO SCALE

NOTE:
FOR GRATING LOCATED ON THE SURFACE OF ANY PEDESTRIAN WAY IN THE PATH OF TRAVEL, GRID OR ANY OPENING IN GRATING SHALL BE LIMITED TO 1/2" IN THE DIRECTION OF TRAFFIC FLOW, PROVIDE MANUFACTURER'S CUT SHEET FOR REVIEW.



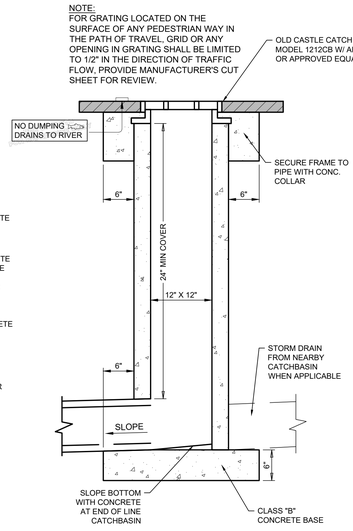
UT3 18"Ø STORM DRAIN CATCH BASIN
NOT TO SCALE

NOTES:
1. PRECAST CONCRETE M.H. UNITS SHALL CONFORM TO A.S.T.M. C-478.
2. PIPE JOINT SHALL BE WITHIN 6 INCHES OF OUTER WALLS OF MANHOLE.
3. MANHOLE BASE TO BE TROWELED SMOOTH INSIDE.
3. SHORT CONE TO BE USED ONLY WHEN MANHOLE DEPTH JUSTIFIES.
5. COLLAR SHALL BE CLASS "B" CONCRETE AND CONSTRUCTED 2 1/2 INCHES BELOW FINISHED GRADE.

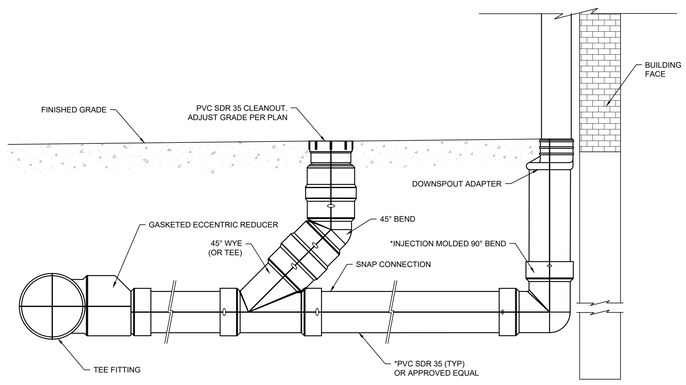


UT4 MAINTENANCE HOLE
NOT TO SCALE

NOTE:
FOR GRATING LOCATED ON THE SURFACE OF ANY PEDESTRIAN WAY IN THE PATH OF TRAVEL, GRID OR ANY OPENING IN GRATING SHALL BE LIMITED TO 1/2" IN THE DIRECTION OF TRAFFIC FLOW, PROVIDE MANUFACTURER'S CUT SHEET FOR REVIEW.



UT5 12" X 12" AREA DRAIN
NOT TO SCALE



UT6 ROOF DRAIN DETAIL W/ CLEANOUT
NOT TO SCALE

AGENCY APPROVAL:

LODI USD

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916.368.7990 / www.hmcarchitects.com

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KEYNOTES

NOTES

REGISTERED PROFESSIONAL ENGINEER — LINDSHALL T. SMITH — No. C87409 — CIVIL — STATE OF CALIFORNIA

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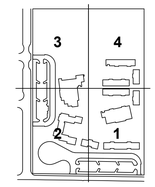
KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
CONSTRUCTION DETAILS

DSA SUBMITTAL

DATE: **12/09/2025**
CLIENT PROJ NO:
SHEET:

C2.0.1

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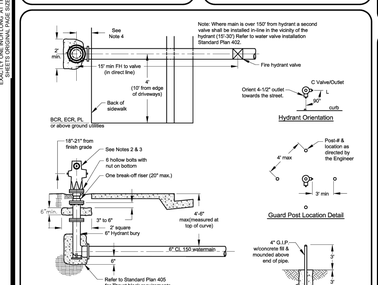
IF THE LINE BROWN ABOVE IS EXACTLY 1" LONG, THESE PLANS ARE SCALED 1/2" = 1'-0" FROM FULL SIZE

CITY OF LODI
PUBLIC WORKS DEPARTMENT

Fire Hydrant Installation



Notes:

1. All work and material shall conform to City of Lodi Construction Specifications.
2. Hydrants shall be painted Federal Yellow at the factory and furnished with National Standard Hose Thread outlets and cast iron caps.
3. All Hydrants are 4-1/2" outlet & one 2-1/2" outlet, with fusion epoxy coated interior. Clow 830; Clow 950; AVK 24/70; Jones 4040.
4. Locate CIL of hydrant per the following:
   1.5' behind walk where F.O.C. to B.O.W. distance is 7.0' or less.
   2.5' behind F.O.C. where F.O.C. to B.O.W. distance is greater than 7.0'
   5' behind F.O.C. in planters.
5. Install guard posts where hydrants are installed in paved areas accessible to traffic or in planters where hydrant is less than 3' behind the curb or when directed by the City.
6. For trench backfill requirement, See Standard Plan 501.
7. Install blue retroreflective hydrant pavement marker per std. plan 716.

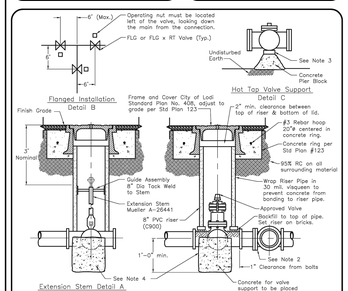
Dr.	JP	No.	Date	Revision	Appr.
Ch.	SN	1	2/08	ADJUSTED GUARD POST DEPTH	
		2	4/22	ORIENTED 4-1/2 OUTLET TO STREET	
Date	11/22	3	10/22	15' MIN FH TO VALVE	
		4	11/22	ADDED NOTE 18-21 TO FG.	

Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 11/29/22 Date

STD PLAN 401

CITY OF LODI
PUBLIC WORKS DEPARTMENT

Water Valve Installation



Notes:

1. Install extension stem when distance from valve cover to operating nut is greater than 12 feet; 3' max. nominal cover per Detail A.
2. Flanged fittings shall be used where lines are to be extended at a later date or as shown on the improvement plans. Operating nuts on flanged valves must be arranged per Detail B.
3. Concrete blocks may be used for valve and riser support; thrust blocks per Standard Plan 405. For Hot Top Valve support refer to Detail C.
4. Place Visqueen around valves before placement of concrete supports.
5. For trench backfill, see Standard Plan 501.

Dr.	KT	No.	Date	Revision	Appr.
Ch.	WS				
Date	7/08				

Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 5/28/08 Date

Sheet 1 of 2

STD PLAN 402

CITY OF LODI
PUBLIC WORKS DEPARTMENT

Water Valve Installation Materials List

All Water Valves & Materials shall be Class 150B with 2" square operating nuts, open left (clockwise to close) and shall conform to AWWA Standard C-504 for Rubber Seated Butterfly Valves and City of Lodi Construction Specs 6-7602.

AWWA Approved Valves:
- M&H/Dow/Kennedy RS Butterfly
- M&H/Clow/Kennedy RS and Butterfly
- American Darling RS Gate valves
- Waterous RS Gate valve
- AVK RS Gate valves

Dr.	KT	No.	Date	Revision	Appr.
Ch.	WS				
Date	7/08				

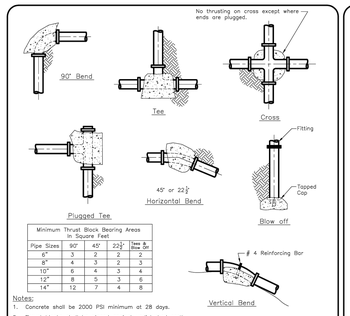
Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 12/28/00 Date

Sheet 2 of 2

STD PLAN 402

CITY OF LODI
PUBLIC WORKS DEPARTMENT

Thrust Block Requirements



Minimum Thrust Block Bearing Areas In Square Feet				
Pipe Sizes	90°	45°	22½°	Tees & Dead Ends
6"	3	2	2	2
8"	4	3	2	3
10"	6	4	3	4
12"	8	5	3	6
14"	12	7	4	8

Notes:

1. Concrete shall be 2000 PSI minimum at 28 days.
2. Thrust blocks shall be placed against undisturbed earth.
3. All fittings shall be supported in concrete.
4. For fire hydrant thrusting see Std. Plan 401.
5. Don't cover flange bolts with concrete.
6. Mechanically restrained joints as required by the City. See Material List Page 2.
7. Wrap all fittings and flanges with Visqueen.

Dr.	KT	No.	Date	Revision	Appr.
Ch.	WS	1	9/03	ADDED NOTE #7	
Date	7/08				

Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 9/25/02 Date

Sheet 1 of 2

STD PLAN 405

CITY OF LODI
PUBLIC WORKS DEPARTMENT

Thrust Block Requirements Material List

Material List for Standard Plan 405

City Approved Mechanical Restrained Joints

Pipe Material	Joint
Ductile Iron	Mega-Lug 1100
CSOPVC	Mega-Lug 2000
IPS PVC	Mega-Lug 2300
PVC Bell and Spicket	Mega-Lug 1600

Dr.	KT	No.	Date	Revision	Appr.
Ch.	WS	1	9/03	ADDED NOTE #7	
Date	7/08				

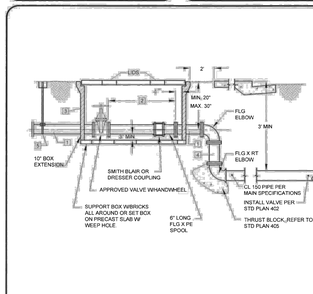
Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 9/25/02 Date

Sheet 2 of 2

STD PLAN 405

CITY OF LODI
PUBLIC WORKS DEPARTMENT

DOMESTIC WATER SERVICE (3", 4", 6" & 8")



NOTES:

1. METER (IF REQUIRED) WILL BE FURNISHED AND INSTALLED BY CITY.
2. BYPASS MAY BE INSTALLED WITH THE SPECIFIC APPROVAL OF THE PUBLIC WORKS DIRECTOR.
3. PLUG ALL OPENINGS IN BOX.
4. BACKFILL SHALL CONFORM TO STD PLAN 501.
5. ALL FITTINGS MUST COMPLY WITH THE LATEST STATE OF CALIFORNIA NO LEAD REQUIREMENTS.

Dr.	KT	No.	Date	Revision	Appr.
Ch.	WS	1	2/05	REVISED SPOOL LENGTHS	
Date	12/00				

Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 4/24/19 Date

SHEET 1 OF 2

STD PLAN 406

CITY OF LODI
PUBLIC WORKS DEPARTMENT

DOMESTIC WATER SERVICE (3", 4", 6" & 8") MATERIALS LIST

1. FLG SPOOL, 24" LONG (2 EA) (C, L, D,, OR STEEL)
2. FLG X PLAIN END SPOOL. LEAVE ½" GAP AT COUPLING
   - 3"-.29" LONG
   - 4"-.38" LONG ENDS OF SPOOLS
   - 6"-.43" LONG (C, OR STEEL)
3. [illegible]

CHRISTY OR BES BOX	LID (TRAFFIC)		BOX EXTENSION
	CHRISTY	BES	
3"x4" B-48 OR C48W	B48-620	62085	10" BOX EXTENSION B44 X 10
6" B-52 OR C52W	B52-620	62090	10" BOX EXTENSION B52 X 10

4. FLG SPOOL, LENGTHS AS NEEDED (OPTIONAL) (C,L, D,, OR STEEL)
5. TEMPORARY BLOWOFF PER STD PLAN 409. 2" FOR 4"-6" SERVICE. 4" FOR 8" AND LARGER SERVICE.

ALL FITTINGS SHALL BE CAST OR DUCTILE IRON OR STEEL (AS NOTED) AND SHALL CONFORM TO APPLICABLE AWWA STANDARDS. (SCH. 40, 150 LB FLG).

TRAFFIC LIDS SHALL BE USED IN ALL LOCATION.

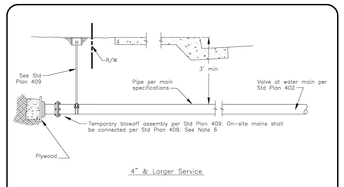
Dr.	KT	No.	Date	Revision	Appr.
Ch.	WS	1	2/05	REVISED SPOOL LENGTHS	
		2	10/08	REVISED SPOOL LENGTHS	
Date	10/08				

Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 4/24/19 Date

STD PLAN 406

CITY OF LODI
PUBLIC WORKS DEPARTMENT

Fire Service



Notes:

1. If not alarmed a detector check valve w/bypass meter shall be installed at fire-sprinkler system connection only. Installation details shall conform to Fire Dept. and Bldg. Dept. requirements. (See Detail A)
2. On-site fire mains shall be completely isolated from domestic lines.
3. On-site fire mains looped to the City system must be specifically approved by the Public Works Director and must be equipped with double check valve assemblies at each connection. In such cases the services shall be installed per Detail B. Double check valve assemblies installed in an appropriately sized box at the property line.
4. Suitable backflow prevention devices will be required for fire systems having auxiliary sources of supply, elevated tanks or chemical additives, or other special conditions.
5. Sufficient valves shall be provided to separate sprinkler, hydrant and domestic systems. Additional main line valves may be required depending on the complexity of the on-site system.
6. Pressure and bacteriological tests per City of Lodi Construction Specifications are required for on-site systems unless waived by the Public Works Director.
7. Systems with booster pumps shall be equipped with a pressure sustaining valve to the approval of the Public Works Director.

Dr.	KT	No.	Date	Revision	Appr.
Ch.	WS	1	9/03	REVISED F.D.C. LOCATION	
		2	2/04	REVISED TEMP. BLOW OFF VALVE	
Date	7/00				

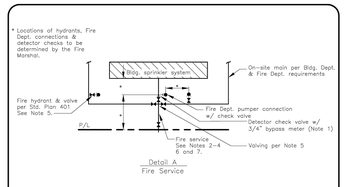
Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 2/12/04 Date

Sheet 1 of 2

STD PLAN 407

CITY OF LODI
PUBLIC WORKS DEPARTMENT

Fire Service



Dr.	KT	No.	Date	Revision	Appr.
Ch.	WS	1	9/03	REVISED F.D.C. LOCATION	
Date	7/00				

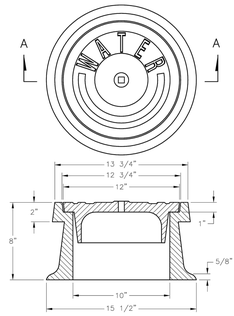
Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 9/25/02 Date

Sheet 2 of 2

STD PLAN 407

CITY OF LODI
PUBLIC WORKS DEPARTMENT

Water Valve Frame & Cover



Notes:

1. Frame — Wt 85 Lbs.
2. Cover — Wt 40 Lbs.
3. Material — Cast Iron
4. Castings shall be dipped in black, bituminous paint.
5. Frame and cover must be H-20 wheel loading rated.

Dr.	KT	No.	Date	Revision	Appr.
Ch.	WS				
Date	7/08				

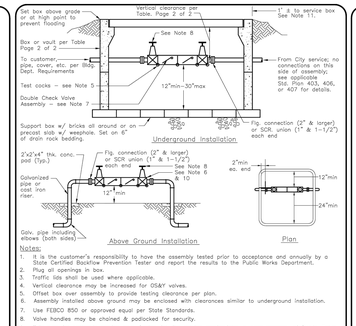
Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 5/28/08 Date

Sheet 1 of 2

STD PLAN 408

CITY OF LODI
PUBLIC WORKS DEPARTMENT

Double Check Valve Assembly



Notes:

1. It is the customer's responsibility to have the assembly tested prior to acceptance and annually by a State Certified Backflow Prevention Tester and report the results to the Public Works Department.
2. Plug all openings in box.
3. Traffic lids shall be used where applicable.
4. Vertical clearance may be increased for OS&Y valves.
5. Offset box over assembly to provide testing clearance per plan.
6. Assembly installed above ground may be enclosed with clearances similar to underground installation.
7. Use FEBCO 850 or approved equal per State Standards.
8. Valve handles may be chained & padlocked for security.
9. This plan for domestic service only. Design for fire service applications to have approval of Public Works Director and Fire Marshal.
10. Install guard posts where device is installed in paved areas accessible to traffic or in planters less than 3' behind the curb or when directed by City.
11. Locate immediately downstream of water service box.

Dr.	KT	No.	Date	Revision	Appr.
Ch.	WS	1	2/04	REVISED MODEL NUMBER ON NOTE #7	
Date	7/08				

Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 2/12/04 Date

Sheet 1 of 2

STD PLAN 411

CITY OF LODI
PUBLIC WORKS DEPARTMENT

Double Check Valve Assembly Materials List

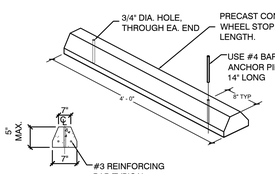
Size	Vertical Clearance min / max	Box or Vault / Lid (See Note 3) (min)	
1"	8" / 18"	Christy B40 or Bes C42W Box/ Christy B40-610 or Bes 61075	
1-1/2"	10" / 18"	Christy B48 or Bes C48W Box/ Christy B48-610 or Bes 62085	
2"	10" / 20"	Christy B48 or Bes C48W Box/ Christy B48-610 or Bes 62085	
3"	16" / 30"	4'x4' Split, hinged lid	
4"	20" / 36"	4'x4' similar to Form-A-Drain	Christy B52 or Bes C52W box/ Christy or Bes 62090
6"	24" / 40"	5'x5' HAL-Lucero	
8"	30" / 48"	7'x5' Assembly	

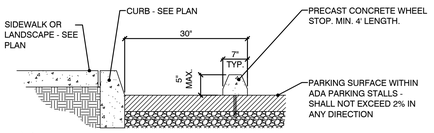
Dr.	KT	No.	Date	Revision	Appr.
Ch.	WS				
Date	7/08				

Approved By: Wesley Sanchez, City Engineer, RCE No. 57884 — 12/28/00 Date

Sheet 2 of 2

STD PLAN 411

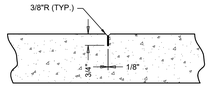




Notes:

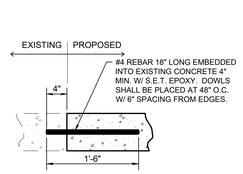
1. ACCESSIBLE PARKING STALLS SHALL BE INSTALLED PER CURRENT CBC (11B-208) AND TITLE 24 CODES AT THE TIME OF CONSTRUCTION.
2. NO PORTIONS OF THE ACCESSIBLE STALL OR DRIVE AISLE SHALL EXCEED 2% SLOPE IN ANY DIRECTION.
3. INSTALL ALL REQUIRED SIGNAGE PER CODE.
4. PAINTED STRIPING AND SIGNAGE SHALL BE STANDARD APPROVED TRAFFIC PAINTING IN CONTRAST TO COLOR OF PAVING. TWO COATS OF THERMOPLASTIC PAINT, TYP.
5. PAINT COLORS SHALL BE TYPICAL BLUE AND WHITE PAINT COLORS FOR ACCESSIBLE STALLS AS APPROVED BY LOCAL JURISDICTION AND/OR STATE.
6. FREE-STANDING SIGNAGE SHALL BE REFLECTORIZED ON PORCELAIN STEEL WITH BEADED TEXT AND ½" RADIUS CORNERS. SECURE TO 2" DIAMETER GALVANIZED POST SET MIN. 30" INTO GRADE WITH CONCRETE FOOTING.
7. UNAUTHORIZED VEHICLE WARNING SIGNAGE MUST BE POSTED IN A LOCATION IMMEDIATELY ADJACENT TO AND VISIBLE FROM EACH ACCESSIBLE STALL OR SPACE.
8. ALL SITE ACCESSIBILITY SIGNAGE TO MEET CBC (11B-216.5) AND TITLE 24 CODES AND TO BE PLACED IN ALL LOCATIONS AS REQUIRED.

9 WHEEL STOP
NOT TO SCALE

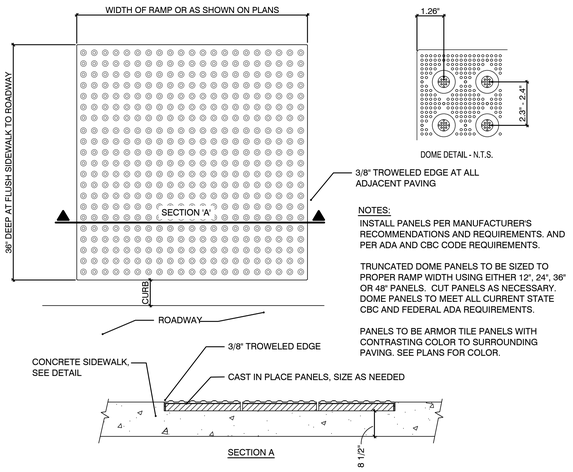


NOTES:
1. MAX SPACING OF WEAKENED PLANE JOINTS ARE 10 FEET IN ANY DIRECTION OR AS SHOWN ON PLANS.

J1 WEAKENDED PLAN JOINT
NOT TO SCALE



J2 DOWEL INTO EXISTING CONCRETE
NOT TO SCALE

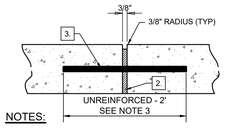


NOTES:
INSTALL PANELS PER MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS. AND PER ADA AND CBC CODE REQUIREMENTS.

TRUNCATED DOME PANELS TO BE SIZED TO PROPER RAMP WIDTH USING EITHER 12", 24", 36" OR 48" PANELS. CUT PANELS AS NECESSARY. DOME PANELS TO MEET ALL CURRENT STATE CBC AND FEDERAL ADA REQUIREMENTS.

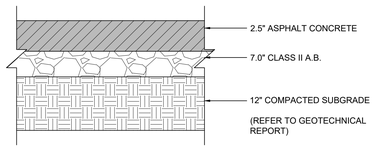
PANELS TO BE ARMOR TILE PANELS WITH CONTRASTING COLOR TO SURROUNDING PAVING. SEE PLANS FOR COLOR.

10 TRUNCATED DOMES
NOT TO SCALE

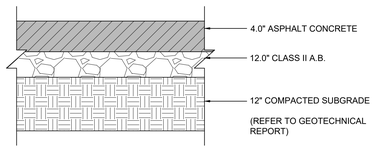


NOTES:
1. CONSTRUCT EXPANSION JOINTS PER AGENCY REQUIREMENTS AT BEGINNING & ENDS OF CURBS, EACH SIDE OF CATCH BASINS, AND OTHER FIXED OBJECTS.
2. PREFORMED FIBER EXPANSION JOINT FILLER CONFORMING TO ASTM D-1751.
3. #4 X 24" STEEL DOWELS TO BE USED AT ALL UNREINFORCED CURB EXPANSION JOINTS. REINFORCED CURB SHALL BE CONTACT LAP SPLICED LENGTH OF (50 X BAR DIAMETER).
4. MAXIMUM SPACING OF EXPANSION JOINTS ARE 80 FEET FOR CURBS AND 100 FEET SQUARE FOR FLATWORK, OR AS SHOWN ON PLANS

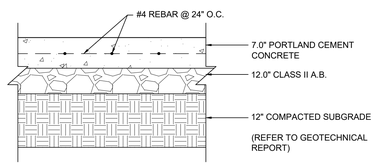
J3 CONCRETE CURB EXPANSION JOINT
NOT TO SCALE



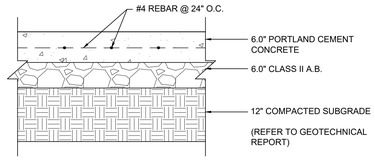
P1 STRUCTURAL SECTION - PARKING, PLAYGROUND & TRACK (TI=4.5)
NOT TO SCALE



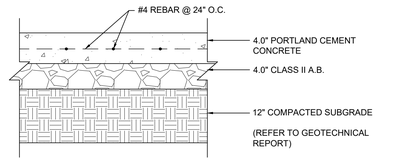
P2 STRUCTURAL SECTION - DRIVE AILES (TI=7.0)
NOT TO SCALE



P3 STRUCTURAL SECTION - DRIVING ASLE (TI=7.0)
NOT TO SCALE



P4 STRUCTURAL SECTION - CONCRETE PARKING
NOT TO SCALE



P5 CONCRETE (SIDEWALKS)
NOT TO SCALE

PLEASE RECYCLE

Autodesk Docs://24319100000_LODI USD SAMUEL M. GANTNER ES R24/24319100000-A-LUSD-GANTNER ES-SITE.rvt
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AGENCY APPROVAL:

LODI USD

HMC Architects — DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100, SACRAMENTO, CA, 95816
916.368.7990 / www.hmcarchitects.com
NOT FOR CONSTRUCTION

ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

NOTES

REGISTERED PROFESSIONAL ENGINEER — LINDSAY T. SMITH — No. C87439 — CIVIL — STATE OF CALIFORNIA

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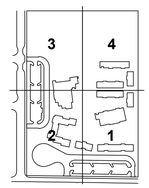
MCR ENGINEERING
www.mcreng.com
MCR ENGINEERING, INC.
1242 DUPONT COURT
MANTECA, CA 95336
TEL : (209) 239 - 6229
FAX : (209) 239 - 8839

KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
CONSTRUCTION DETAILS

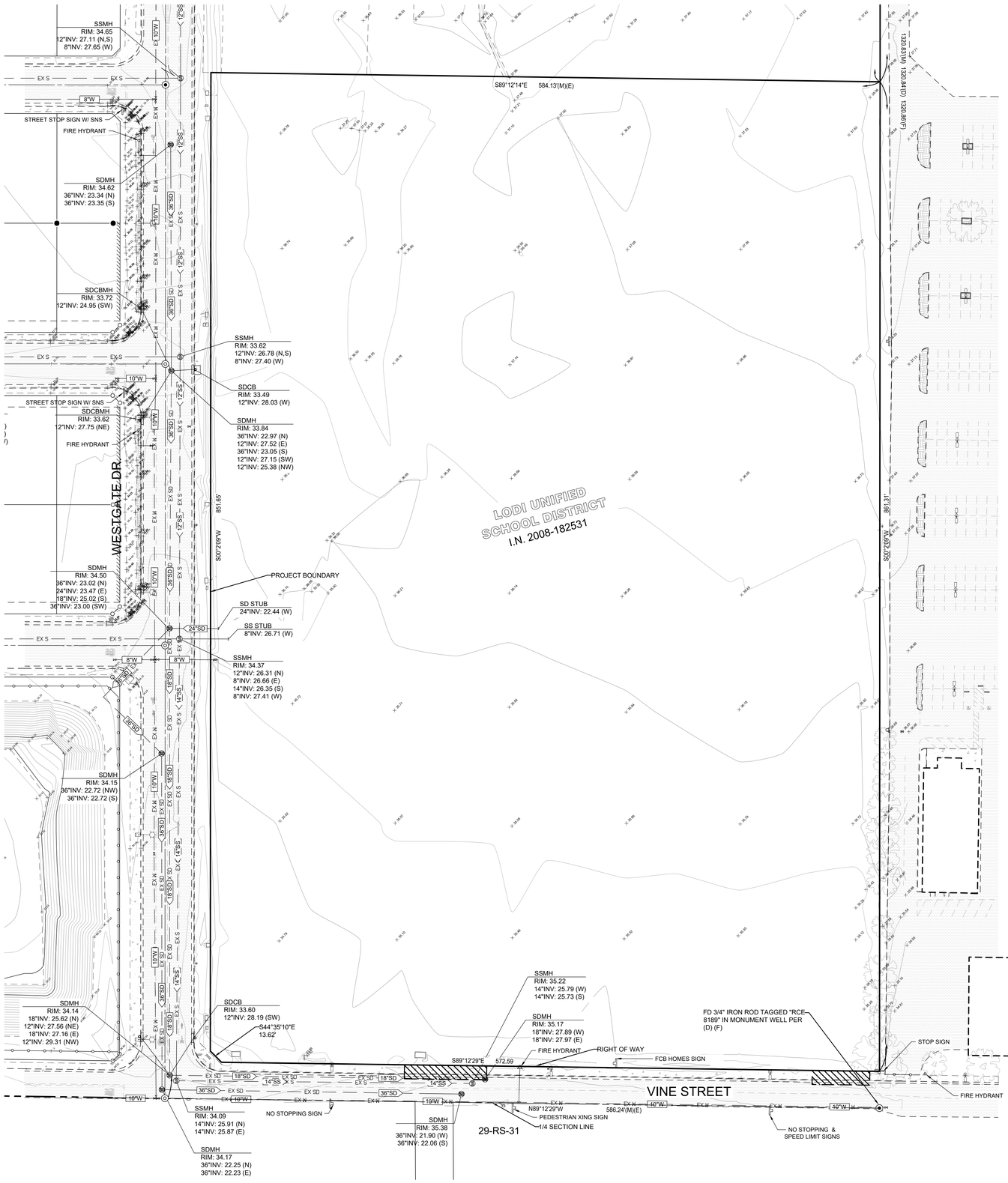
DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

C2.1.1

THE LINE BROKEN ABOVE IS EXACTLY 3" LONG WHEN PLOTTED AT 1"=40 SHEET 5 ORIGINAL PAGE SIZE



DEMOLITION LEGEND

- SAWCUT LINE
- EDGE OF WORK LIMIT
- DEMO & REMOVE
- EXISTING PAVEMENT: (TO REMAIN)
- EXISTING CONCRETE: (TO REMAIN)
- DEMO CONCRETE

TOPO NOTES:

1. UNLESS OTHERWISE IDENTIFIED ALL EXISTING FACILITIES SHOWN IN THE TOPOGRAPHIC AND DEMO PLAN ARE TO BE PRESERVED AND PROTECTED DURING CONSTRUCTION. CONTACT DESIGN ENGINEER IF FACILITIES SHOWN TO REMAIN COME IN CONFLICT WITH PROPOSED IMPROVEMENTS.
2. ALL EXISTING UTILITIES WERE PLOTTED FROM RECORD INFORMATION AND FIELD TOPOGRAPHY. ACTUAL LOCATIONS MAY VARY AND ADDITIONAL CROSSINGS MAY EXIST IN THE FIELD. IT IS IMPERATIVE THAT "U.S.A." LOCATION SERVICES ARE LOCATED AND MARKED PRIOR TO START OF EXCAVATION.
3. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN EXPOSING EXISTING UTILITY CROSSINGS AND SERVICES.
4. ANY DAMAGE TO EXISTING UTILITIES WILL BE SOLE RESPONSIBILITY OF THE CONTRACTOR.
5. ANY DAMAGE TO EXISTING SIDEWALK, CURB OR GUTTER WILL BE SOLE RESPONSIBILITY OF THE CONTRACTOR, WITH REPLACEMENT TO BE DETERMINED BY THE ENGINEER.
6. CONTRACTOR SHALL ADJUST EXISTING MANHOLE RIMS, WATER VALVES, AND MONUMENT BOXES TO FINISH GRADE.
7. ALL SAWCUTS SHALL BE MADE AT EXISTING EXPANSION OR WEAKENED PLANE JOINTS WITH APPROVAL PENDING DISTRICT REPRESENTATIVE.
8. CONTRACTOR TO CONFIRM AREAS OF NONCOMPLIANCE WITH INSPECTOR PRIOR TO CONSTRUCTION
9. WHEN REMOVING CONCRETE AT AREAS OF NON COMPLIANCE, CONTRACTOR SHALL REMOVE BEYOND THE LIMIT SHOWN TO THE NEAREST JOINT.

NORTH

0 20 40

PLEASE RECYCLE

AGENCY APPROVAL:

LODI USD

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ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

NOTES

REGISTERED PROFESSIONAL ENGINEER JAMES H. SMITH No. C077433 CIVIL STATE OF CALIFORNIA

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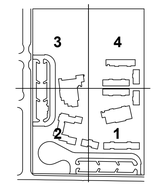
KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
TOPOGRAPHIC SURVEY & DEMOLITION PLAN

DSA SUBMITTAL

DATE: **12/09/2025** CLIENT PROJ NO:

SHEET:

C3.0.1

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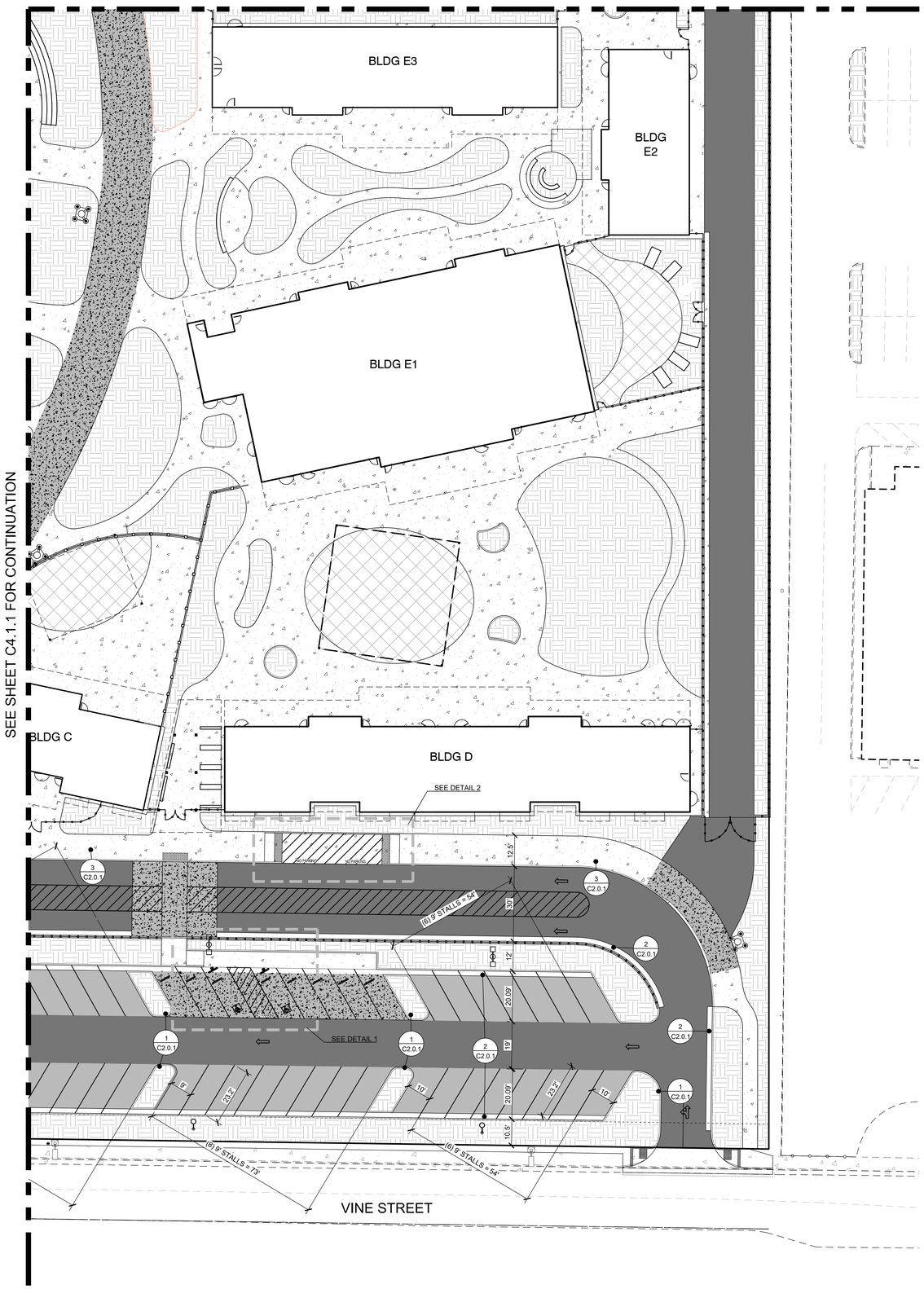
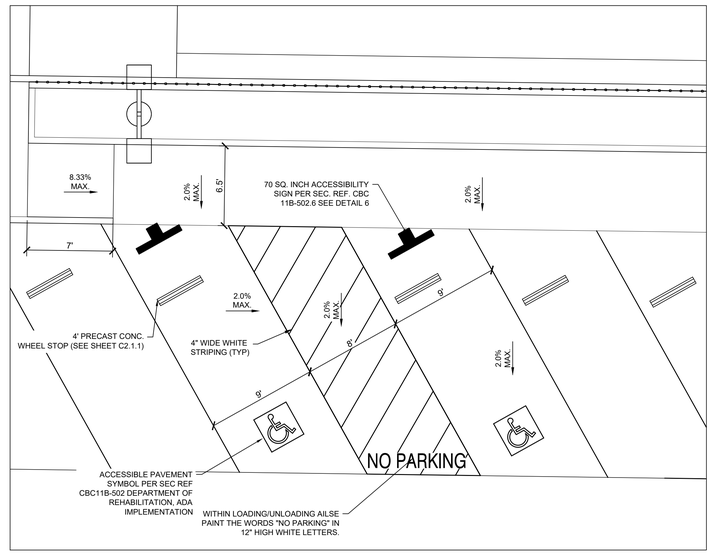
THE LINE BROWN ABOVE IS EQUAL TO 1" ON ORIGINAL SHEETS ORIGINAL PAGE SIZE

SEE SHEET C4.3.1 FOR CONTINUATION



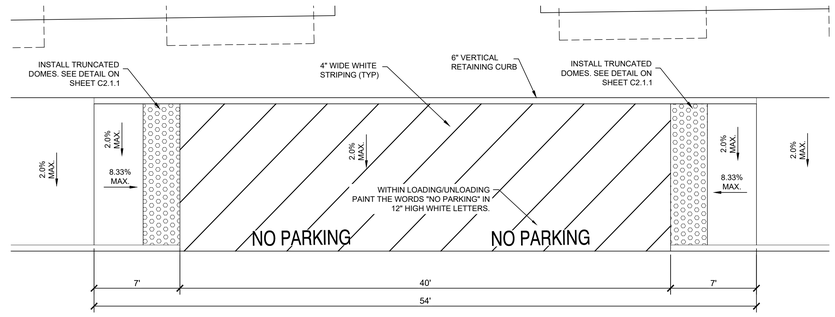
SEE SHEET C4.1.1 FOR CONTINUATION



1 ADA STALLS @ PARKING LOT 1

SCALE: 1" = 5'

REFER TO GRADING PLANS FOR ACTUAL DESIGN GRADES



2 ADA DROP-OFF @ PARKING LOT 1

SCALE: 1" = 5'

REFER TO GRADING PLANS FOR ACTUAL DESIGN GRADES

INTERNATIONAL SYMBOL OF ACCESSIBILITY:

1. SYMBOL SHALL BE WHITE FIGURE ON BLUE BACKGROUND.
2. A SURFACE IDENTIFICATION AT ALL ACCESSIBLE PARKING STALLS SHALL BE 3' X 3' AND SHALL BE LOCATED SO THAT IT IS VISIBLE TO A TRAFFIC ENFORCEMENT OFFICER WHEN A VEHICLE IS PROPERLY PARKED.

SIGNAGE

1. EACH PARKING SPACE SHALL HAVE A PERMANENT (70 SQ. IN. MIN.) ACCESSIBLE SIGN.
2. FREE STANDING SIGNS LOCATED AT INTERIOR END OF A PARKING SPACE SHALL BE MOUNTED A MINIMUM OF 80" ABOVE FINISH GRADE.
3. WALL MOUNTED SIGNS MAY ALSO BE LOCATED AT INTERIOR. END OF PARKING SPACE AND SHALL BE MOUNTED A MINIMUM OF 60" ABOVE FINISH GRADE.
4. OFF-STREET PARKING FACILITIES SHALL HAVE A SIGN AT EACH STREET ENTRANCE OR AT EACH PARKING STALL NOT LESS THAN 17" X 22" IN SIZE, ALSO IN 1" HIGH LETTERS , AS FOLLOWS:

"UNAUTHORIZED VEHICLES PARKED IN DESIGNATED ACCESSIBLE SPACES NOT DISPLAYING DISTINGUISHING PLACARDS OR SPECIAL LICENSE PLATE ISSUED FOR PERSONS WITH DISABILITIES WILL BE TOWED AWAY AT THE OWNER'S EXPENSE. TOWED VEHICLE MAY BE RECLAIMED AT THE LODI POLICE DEPARTMENT OR BY TELEPHONING (209) 369-CRIME."

PARKING NOTES

1. ACCESSIBLE SPACE SHALL BE AS NEAR AS POSSIBLE TO THE PRIMARY ENTRANCE OF THE BUILDING.
2. FREE STANDING SIGNS LOCATED AT INTERIOR END OF A PARKING SPACE SHALL BE MOUNTED A MINIMUM 80 " HIGH IF IN PATH OF TRAVEL.
3. BUMPERS ARE REQUIRED WHEN NO CURB BARRIER IS PROVIDED WHICH WILL PREVENT ENCROACHMENT OF CARS OVER WALKWAYS.
4. WHEELCHAIRS USERS MUST NOT BE FORCED TO GO BEHIND PARKED CARS OTHER THAN THEIR OWN.
5. EACH PARKING SPACE IS REQUIRED TO BE AT LEAST 18' LONG.
6. SURFACE SLOPES OF PARKING AREAS FOR THE DISABLED SHOULD BE MINIMAL, BUT ARE REQUIRED NOT TO EXCEED 1:48 IN ANY DIRECTION.

NOTES:

1. DIMENSION TO FLOWLINE OF CURB UNLESS OTHERWISE NOTED.
2. SEE ARCHITECTURAL DRAWINGS FOR CONCRETE JOINT PATTERNS AND LOCATIONS.
3. ALL CURBS ADJACENT TO ENTRANCES TO A PARKING LOT, TRASH ENCLOSURE, PORTE COCHERE, AISLE WITHOUT PARKING, LOADING ZONE, AND EXTERIOR CURB OF ANY INTERIOR PARKING ISLANDS MUST BE PANTED RED WITH WHITE LETTERING DESIGNATING "NO PARKING FIRE LANE".
4. SEE ARCHITECTURAL PLANS FOR ADA SIGNAGE.
5. CONTRACTOR SHALL ADJUST EXISTING MANHOLE RIMS, WATER VALVES, ELECTRICAL BOXES/VAULTS, UTILITY APPURTENANCES & MONUMENT BOXES TO FINISH GRADE.

PAVEMENT SECTIONS:

- ASPHALT PAVEMENT: T.I. = 7.0 • 4.0" A.C. OVER 12.0" A.B.
- ASPHALT PAVEMENT: T.I. = 4.5 • 2.5" A.C OVER 7.0" A.B.
- HEAVY CONCRETE: • 7.0" CONCRETE OVER 6.0" A.B.
- CONCRETE: • 4.0" CONCRETE OVER 6.0" A.B.
- EXISTING CONCRETE:
- EXISTING PAVEMENT:
- 1 / C2.0 DETAIL LETTER / NUMBER SHEET LOCATION

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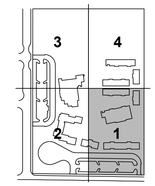

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LODI, CA 95242

PROJECT:
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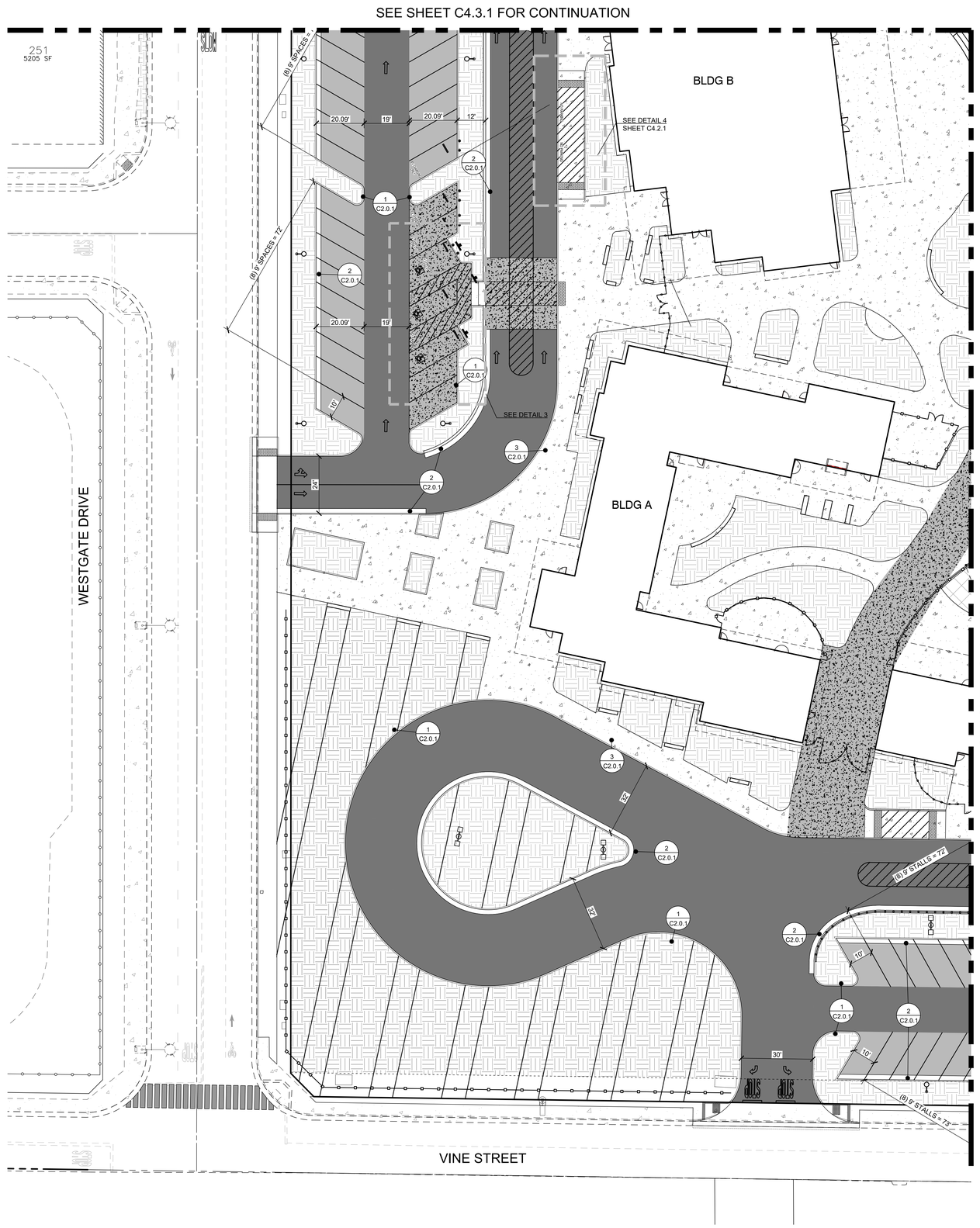

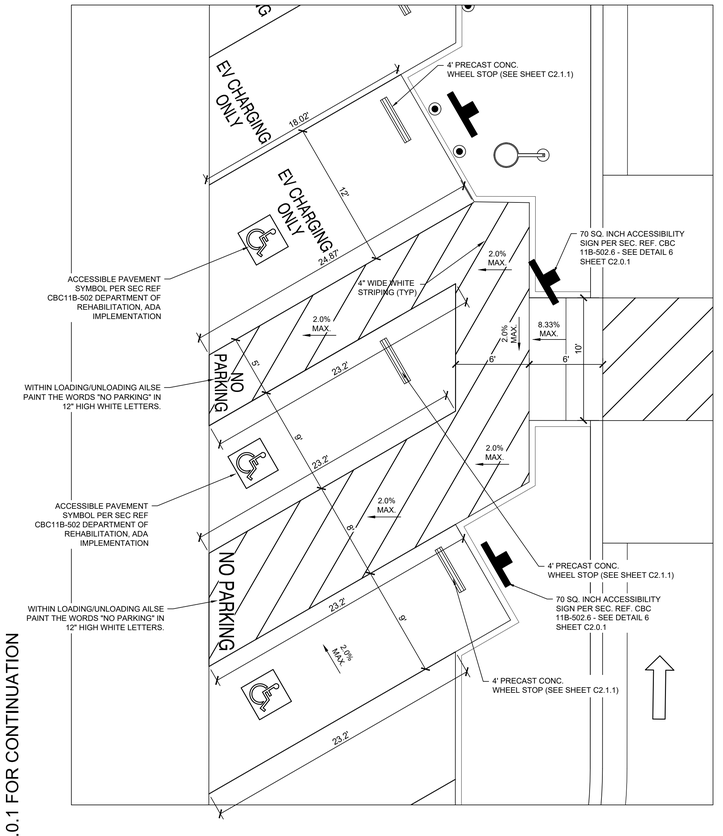

3 ADA PARKING @ PARKING LOT 2
SCALE: 1" = 5'
REFER TO GRADING PLANS FOR ACTUAL DESIGN GRADES

INTERNATIONAL SYMBOL OF ACCESSIBILITY:

1. SYMBOL SHALL BE WHITE FIGURE ON BLUE BACKGROUND.
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- EXISTING PAVEMENT:
- 1 / C2.0 DETAIL LETTER / NUMBER SHEET LOCATION

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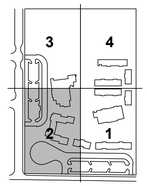

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LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
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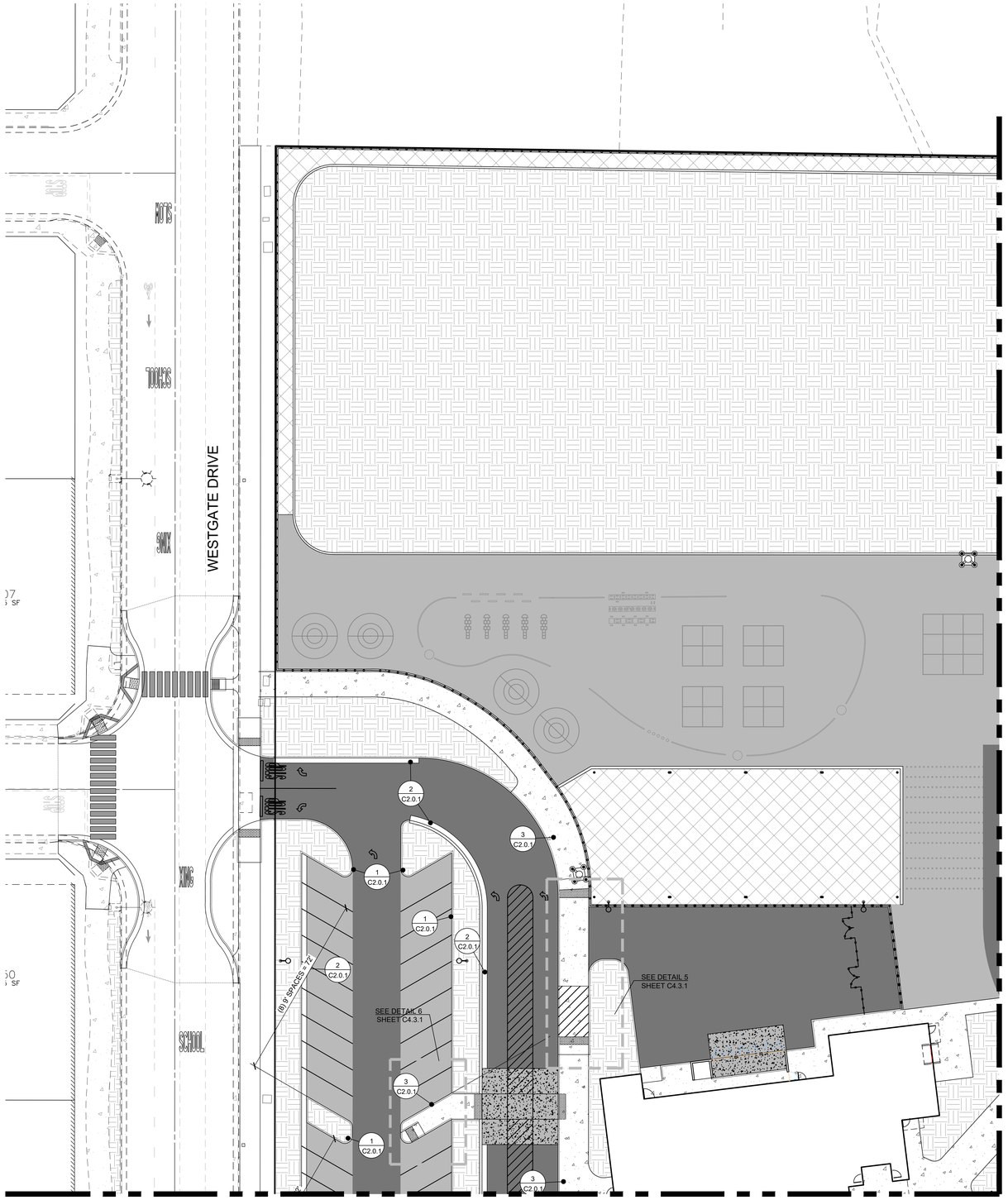

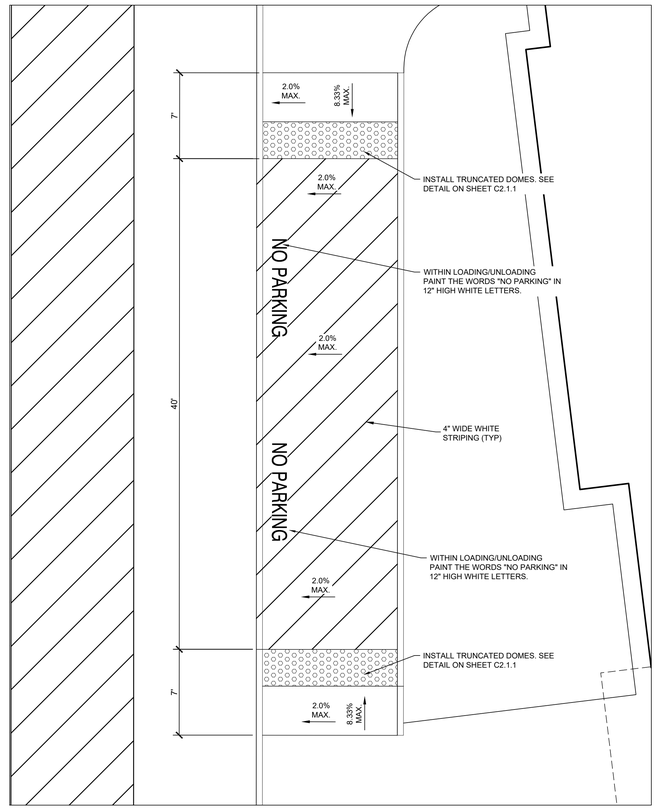

4 ADA DROP-OFF @ PARKING LOT 2

SCALE: 1" = 5'

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- EXISTING PAVEMENT:
- 1 / C2.0 DETAIL LETTER / NUMBER SHEET LOCATION

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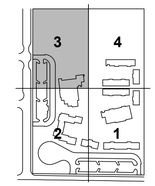

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SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

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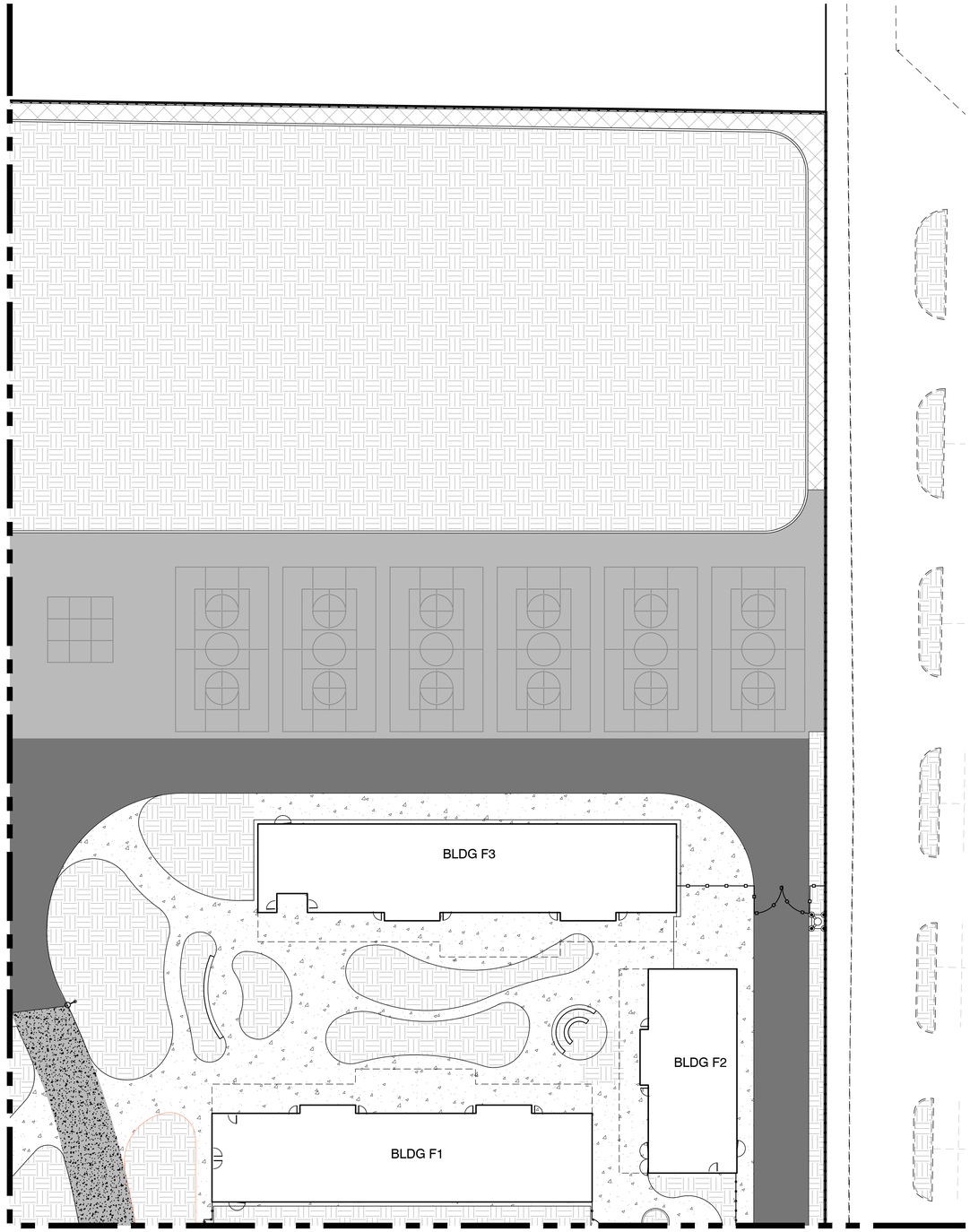
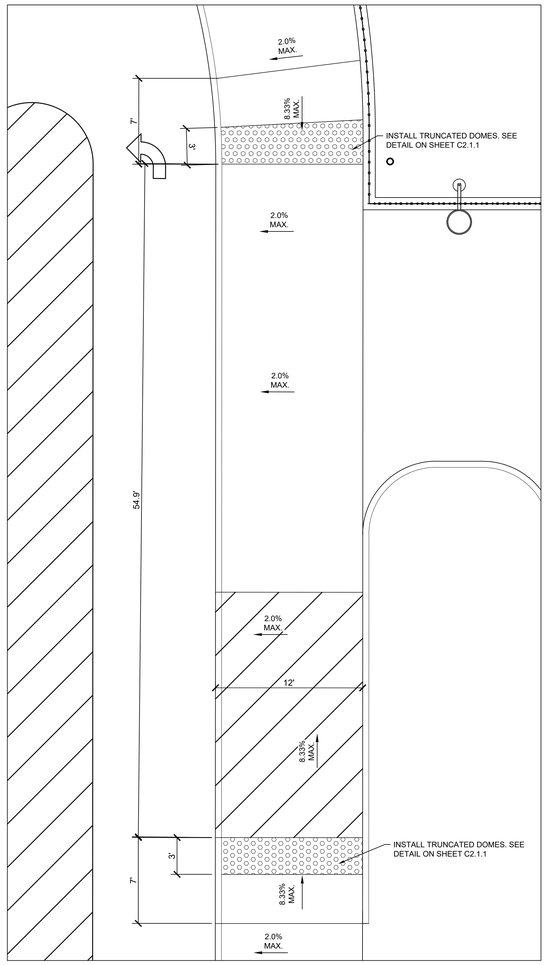


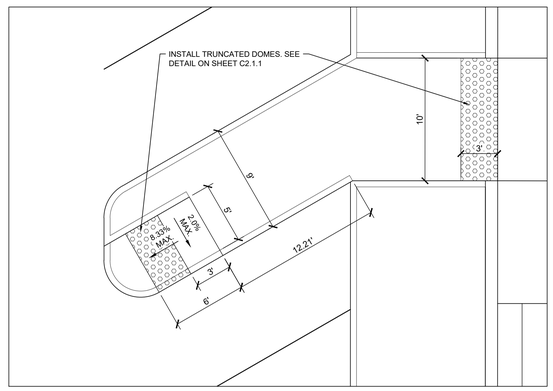
SEE SHEET C4.0.1 FOR CONTINUATION



5 ADA RAMPS @ UTILITY YARD DRIVEWAY

SCALE: 1" = 5'

REFER TO GRADING PLANS FOR ACTUAL DESIGN GRADES



6 ADA RAMP @ PARKING LOT 2

SCALE: 1" = 5'

REFER TO GRADING PLANS FOR ACTUAL DESIGN GRADES

NOTES:

1. DIMENSION TO FLOWLINE OF CURB UNLESS OTHERWISE NOTED.
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3. ALL CURBS ADJACENT TO ENTRANCES TO A PARKING LOT, TRASH ENCLOSURE, PORTE COCHERE, AISLE WITHOUT PARKING, LOADING ZONE, AND EXTERIOR CURB OF ANY INTERIOR PARKING ISLANDS MUST BE PANTED RED WITH WHITE LETTERING DESIGNATING "NO PARKING FIRE LANE".
4. SEE ARCHITECTURAL PLANS FOR ADA SIGNAGE.
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PAVEMENT SECTIONS:

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- ASPHALT PAVEMENT: T.I. = 4.5 • 2.5" A.C OVER 7.0" A.B.
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- EXISTING CONCRETE:
- EXISTING PAVEMENT:
- 1 / C2.0 DETAIL LETTER / NUMBER SHEET LOCATION

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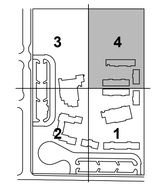

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2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
DIMENSIONING & PAVING PLAN NE

DSA SUBMITTAL

DATE: **12/09/2025** CLIENT PROJ NO:

SHEET:

C4.3.1

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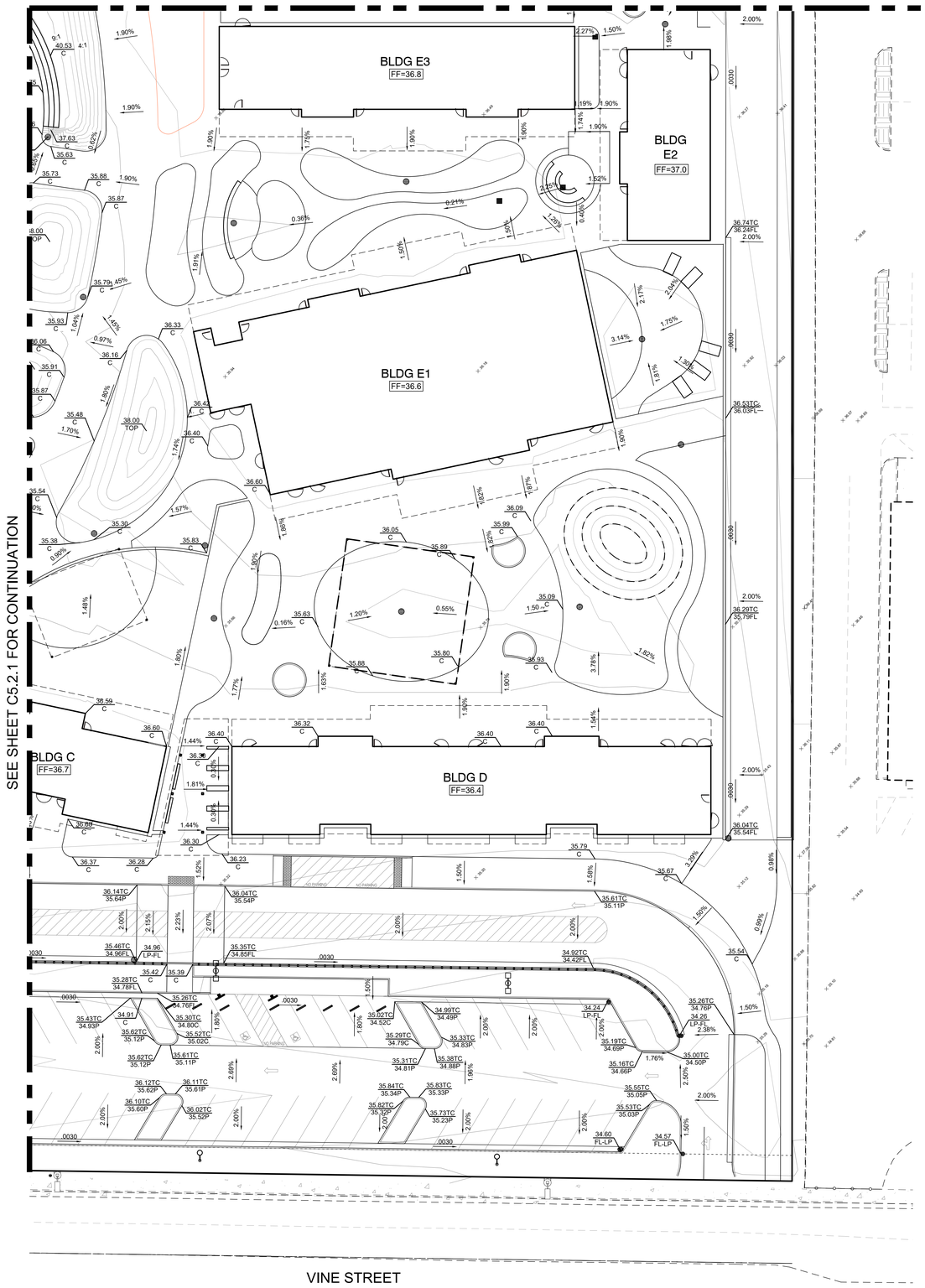
SEE SHEET C5.3.1 - GRADING PLAN NE FOR CONTINUATION

SEE SHEET C5.2.1 FOR CONTINUATION



EXISTING / PROPOSED

EXISTING	PROPOSED
XXXX EXISTING GROUND	XX.XX / XX ELEVATION
	X.XX% SLOPE
	#### DIRECTION OF FLOWLINE

GRADING NOTES:

1. FOR ACCESSIBLE PATH OF TRAVEL REQUIREMENTS REFER TO ARCHITECTURAL PLANS, SHEET G1.11.1.
2. SURFACE GRADES AT EXTERIOR DOORS AND LANDINGS SHALL HAVE SLOPES NO STEEPER THAN 1.9% IN ANY DIRECTION.
3. ENTRANCE GRADES AT LANDINGS SHALL NOT BE LOWER THAT 1/4-INCH FROM BUILDING FINISH FLOOR ELEVATION.
4. SEE ARCHITECTURAL DRAWINGS FOR ALL CONCRETE PATTERNS & SCORING.
5. ALL NEW SURFACE IMPROVEMENTS LOCATED WITHIN DESIGNATED PATH OF TRAVEL SHALL HAVE A MAXIMUM CROSS SLOPE OF 1.90% AND A MAXIMUM LONGITUDINAL SLOPE OF 4.90% UNLESS AREAS OTHERWISE DESIGNATED AS RAMPS. REFER TO ARCHITECTURAL PLANS (SEE SHEET AS1.4) FOR ACCESSIBLE PATH OF TRAVEL LOCATIONS AND DETAILS
6. CURB RAMPS SHALL HAVE A MAXIMUM LONGITUDINAL SLOPE OF 8.33% AND A MAXIMUM CROSS SLOPE OF 1.90%
7. FLOWLINE GRADES @ CURB INLET CATCH BASIN LOW POINTS ARE PROJECT FLOW LINE GRADES. CONTRACTOR SHALL CONSTRUCT LOW POINT PER PLANS CURB INLET CATCH BASIN DETAIL HOLDING TOP OF CURB GRADE.

NORTH

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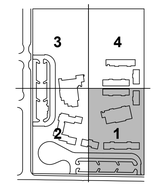

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
GRADING PLAN SE

DSA SUBMITTAL

DATE: **12/09/2025**
CLIENT PROJ NO:

SHEET:
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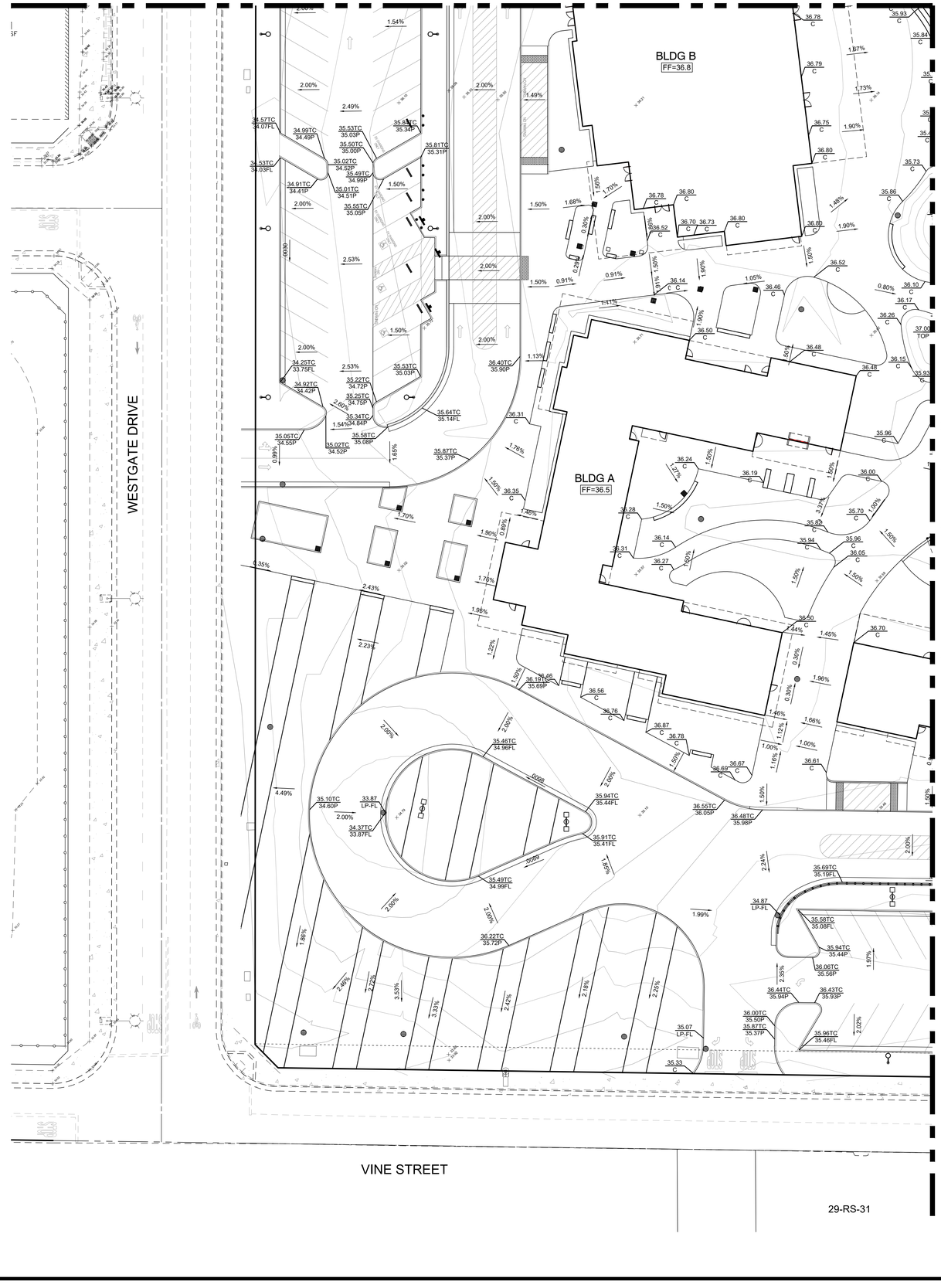

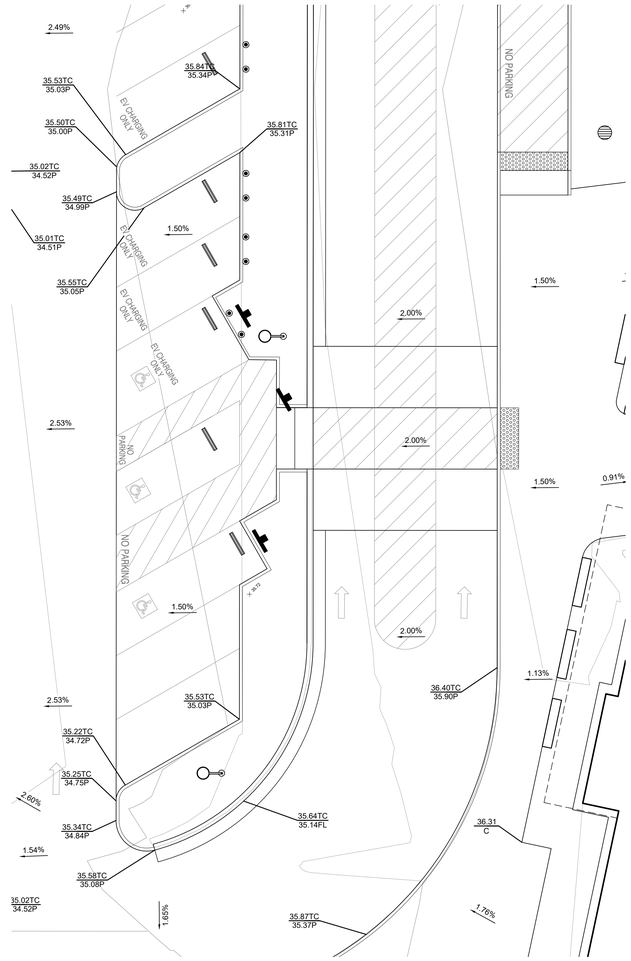

EXISTING		PROPOSED	
XX.XX	EXISTING GROUND	XX.XX / XX	ELEVATION
		X.XX%	SLOPE
		.####	DIRECTION OF FLOWLINE

GRADING NOTES:

1. FOR ACCESSIBLE PATH OF TRAVEL REQUIREMENTS REFER TO ARCHITECTURAL PLANS, SHEET G1.11.1.
2. SURFACE GRADES AT EXTERIOR DOORS AND LANDINGS SHALL HAVE SLOPES NO STEEPER THAN 1.9% IN ANY DIRECTION.
3. ENTRANCE GRADES AT LANDINGS SHALL NOT BE LOWER THAT 1/4-INCH FROM BUILDING FINISH FLOOR ELEVATION.
4. SEE ARCHITECTURAL DRAWINGS FOR ALL CONCRETE PATTERNS & SCORING.
5. ALL NEW SURFACE IMPROVEMENTS LOCATED WITHIN DESIGNATED PATH OF TRAVEL SHALL HAVE A MAXIMUM CROSS SLOPE OF 1.90% AND A MAXIMUM LONGITUDINAL SLOPE OF 4.90% UNLESS AREAS OTHERWISE DESIGNATED AS RAMPS. REFER TO ARCHITECTURAL PLANS (SEE SHEET AS1.4) FOR ACCESSIBLE PATH OF TRAVEL LOCATIONS AND DETAILS
6. CURB RAMPS SHALL HAVE A MAXIMUM LONGITUDINAL SLOPE OF 8.33% AND A MAXIMUM CROSS SLOPE OF 1.90%
7. FLOWLINE GRADES @ CURB INLET CATCH BASIN LOW POINTS ARE PROJECT FLOW LINE GRADES. CONTRACTOR SHALL CONSTRUCT LOW POINT PER PLANS CURB INLET CATCH BASIN DETAIL HOLDING TOP OF CURB GRADE.

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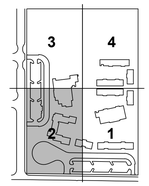

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PROJECT:
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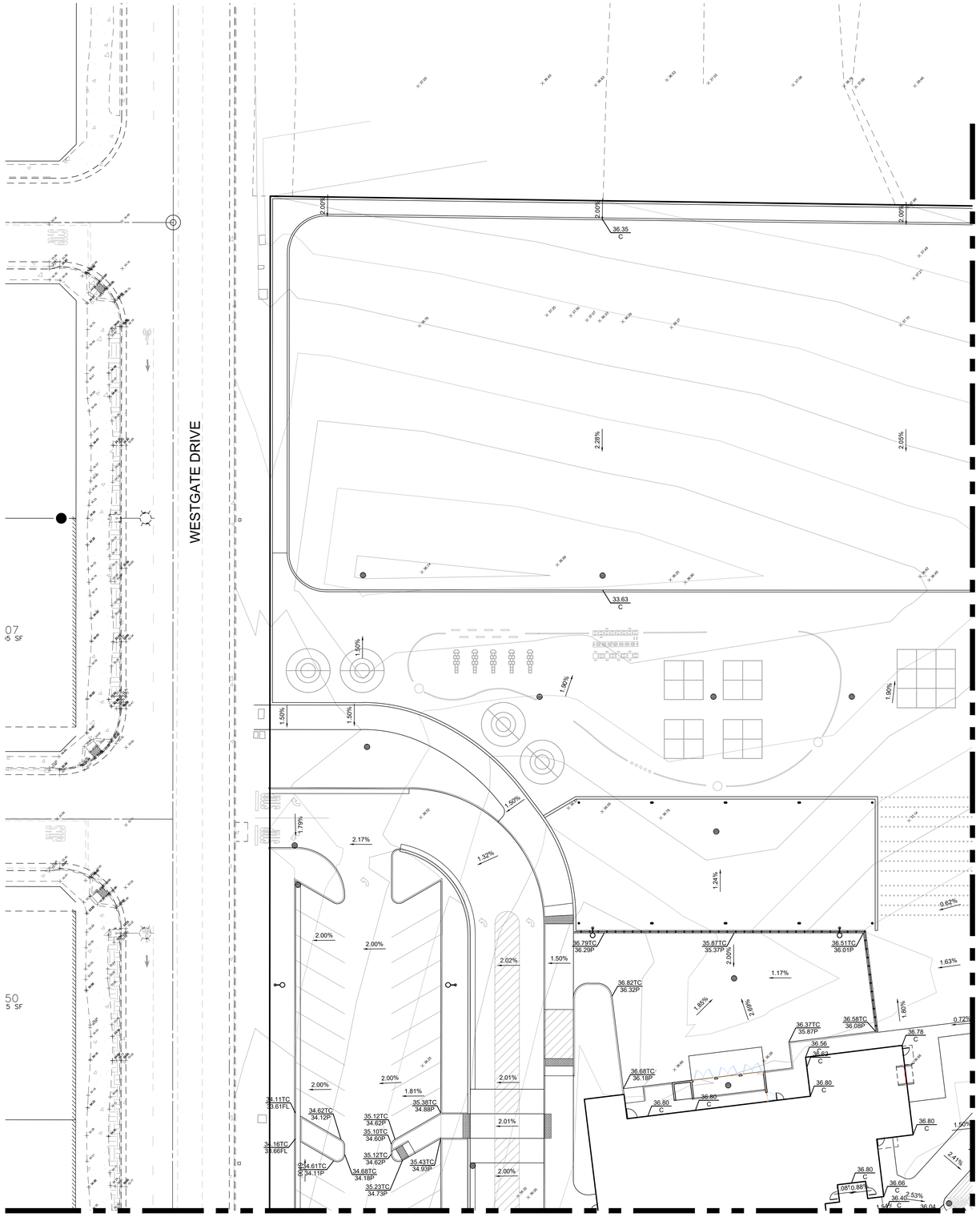

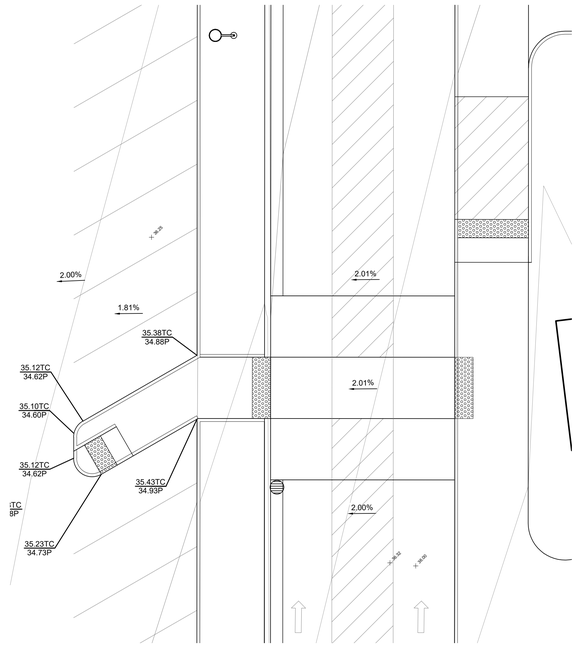

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XX.XX / XX — ELEVATION

X.XX% — SLOPE

— DIRECTION OF FLOWLINE

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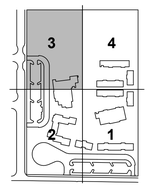

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PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
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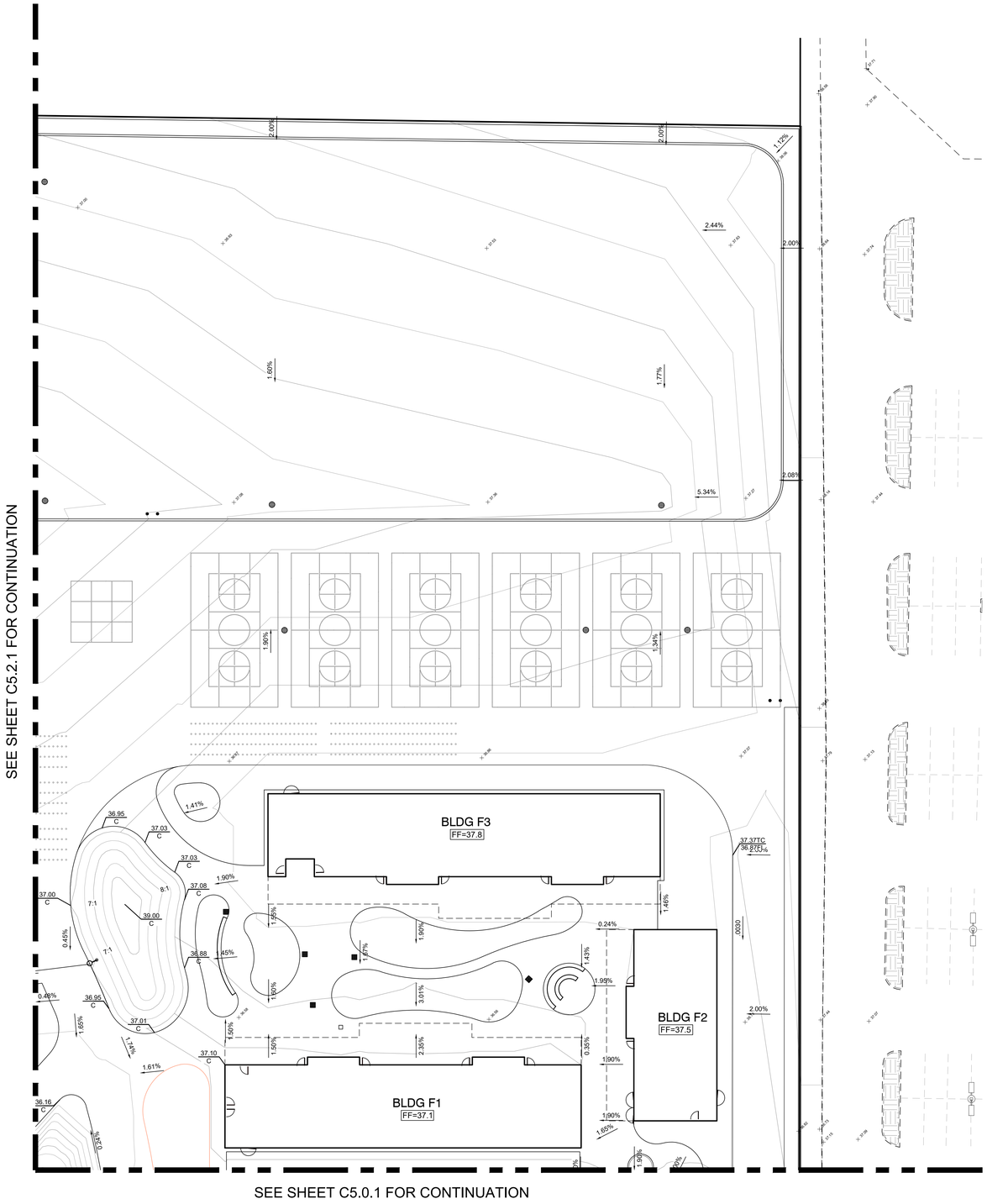

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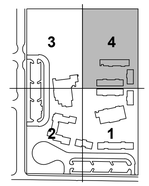

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PROJECT:
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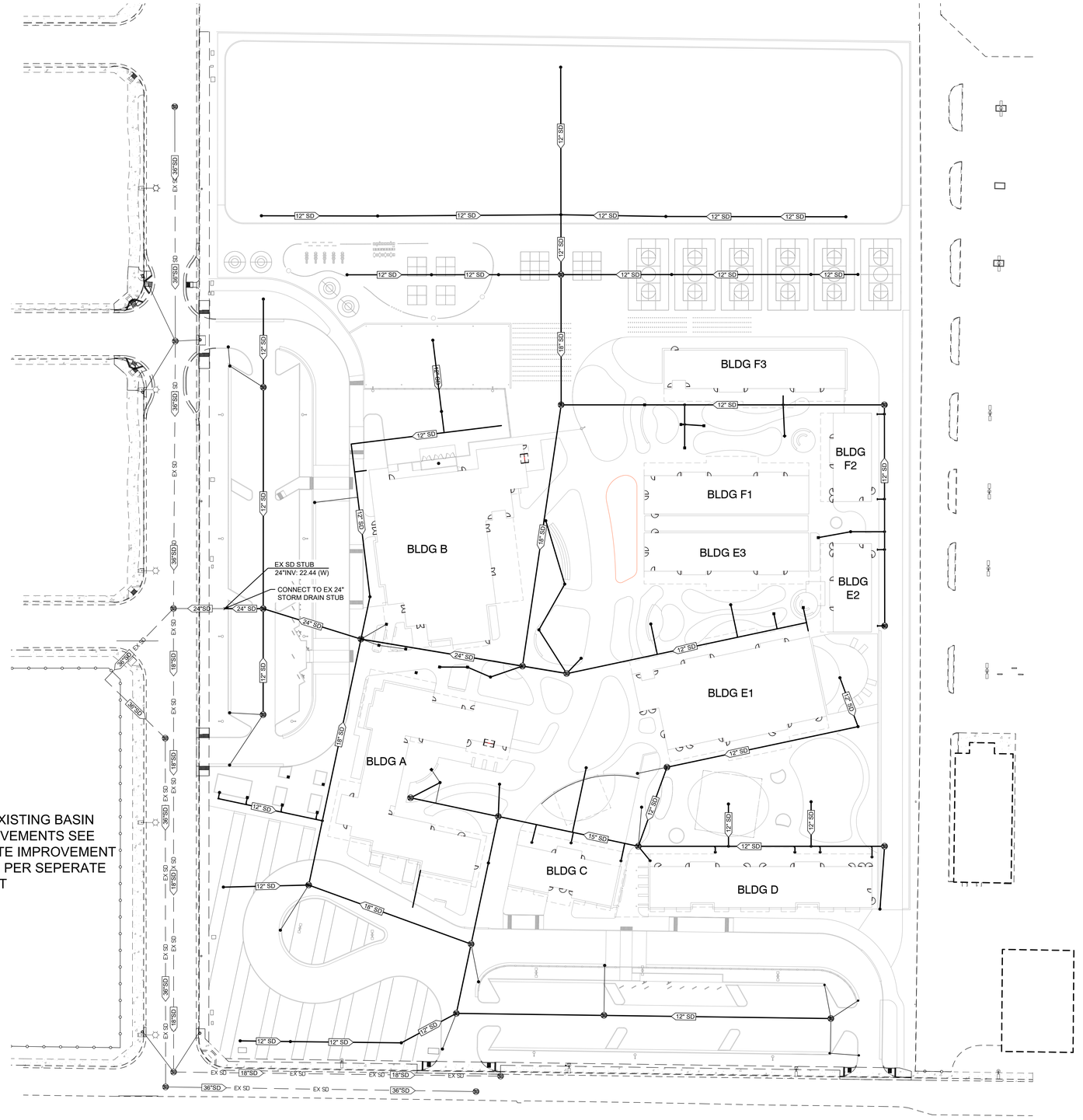

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2. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN EXPOSING EXISTING UTILITY CROSSING AND SERVICES.
3. ANY DAMAGE TO EXISTING UTILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
4. ALL UTILITIES TO BE RAISED TO GRADE

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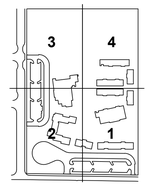

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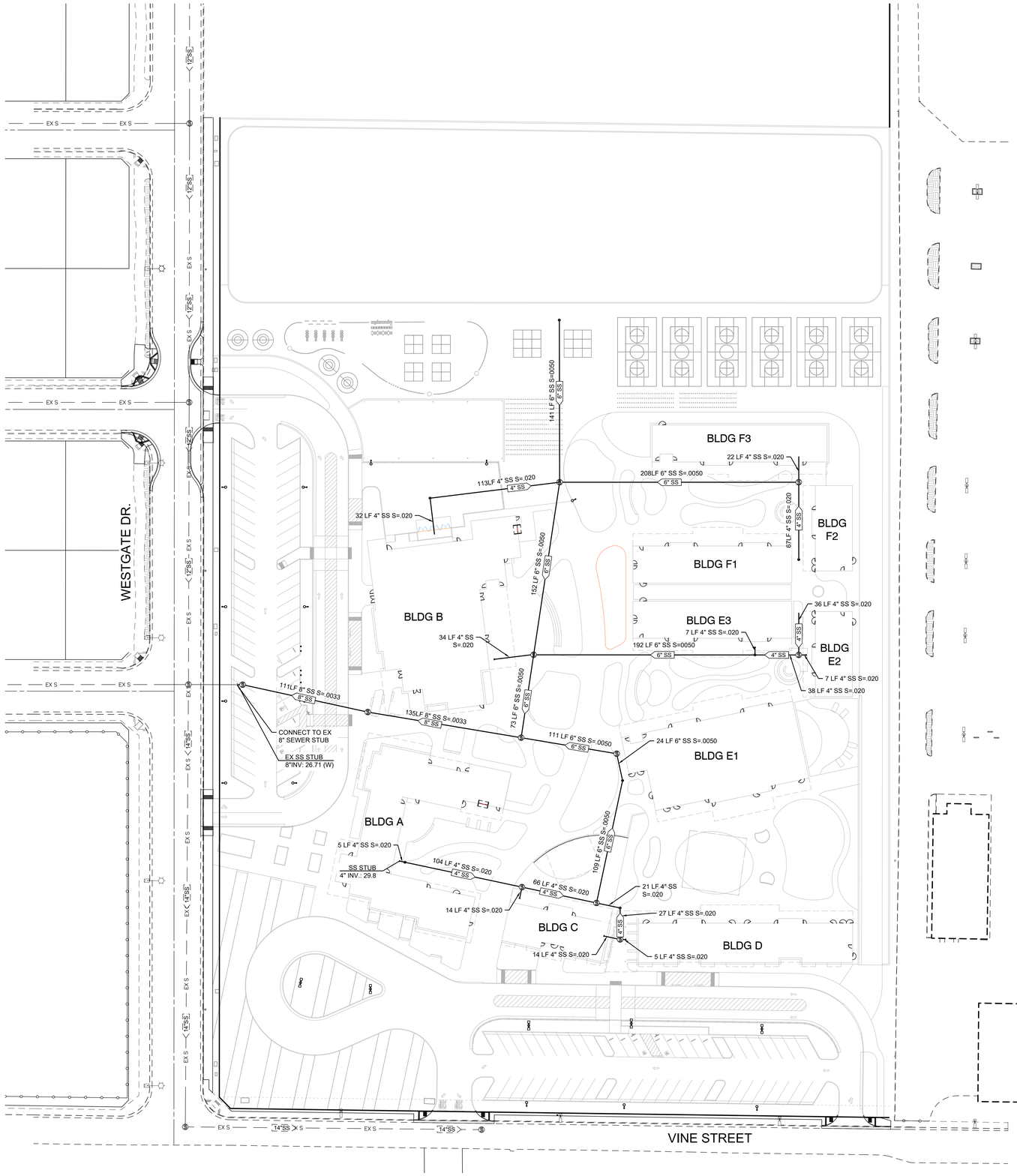

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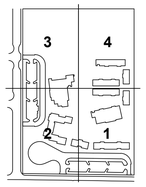

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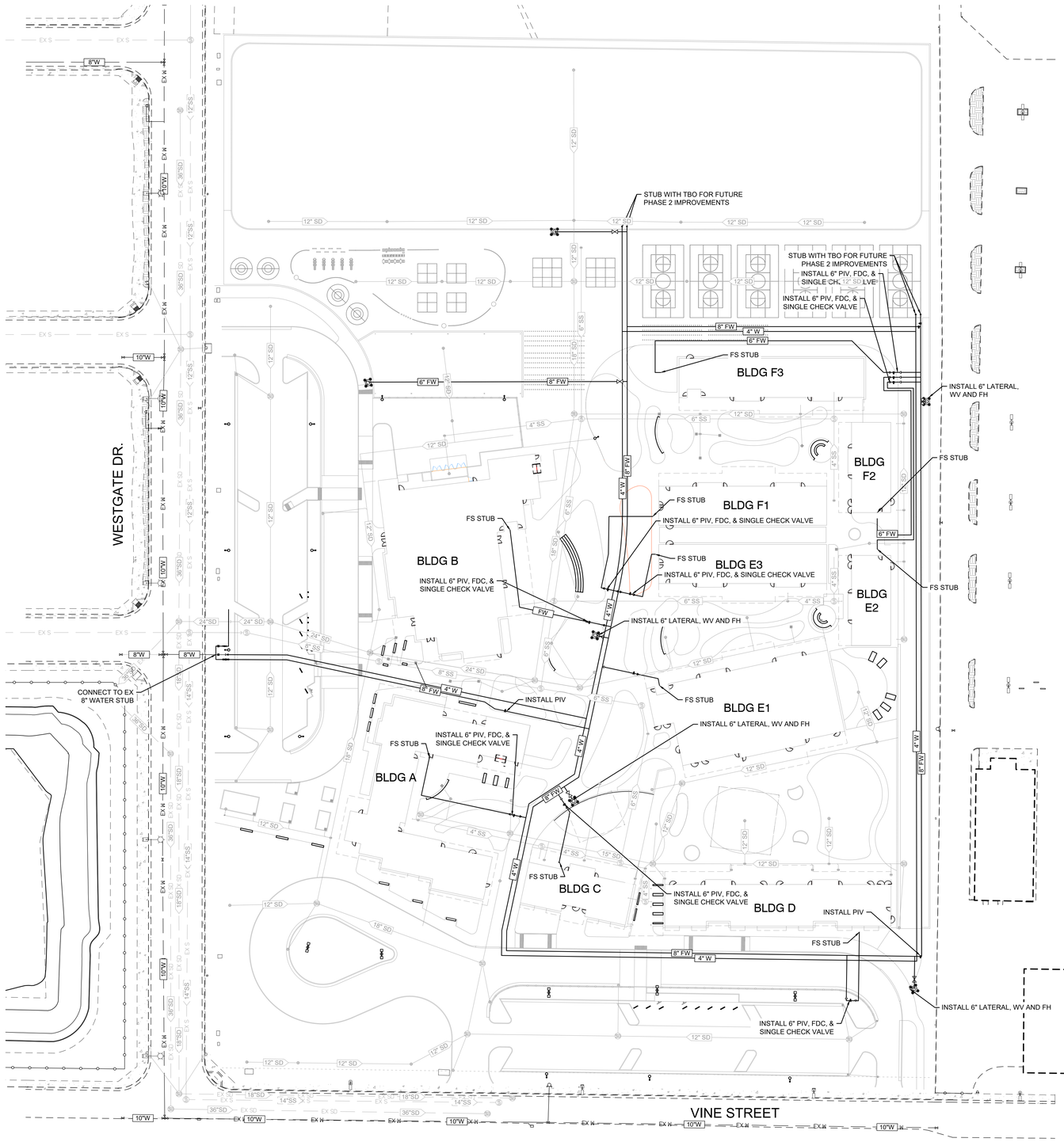

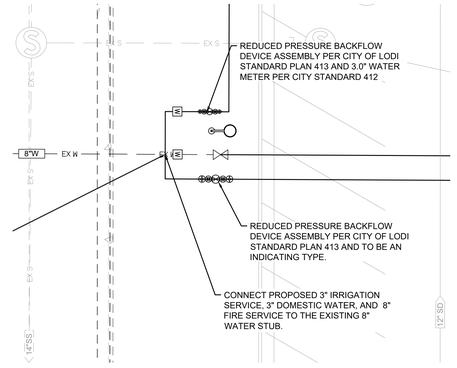

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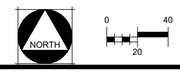
4. GAS LINE SHOWN ON THIS DRAWING FOR UTILITY COORDINATION ONLY. DESIGN, MATERIALS AND SPECIFICATIONS BY OTHER. SEE PLUMBING SITE PLAN
5. SEE THRUST BLOCK SCHEDULE SHEET C2.1.1
6. ALL FIRE PROTECTION WATER LINE MATERIALS SHALL BE APPROVED BY THE LOCAL FIRE MARSHAL PRIOR TO INSTALLATION.

NOTES FOR UNDERGROUND PIPING FOR PRIVATE HYDRANTS & SPRINKLERS

1. PRIOR TO INSTALLATION, ALL PLANS AND SPECIFICATIONS SHALL BE APPROVED BY DSA. REFER TO DSA IR A-25 FOR DESIGN, INSTALLATION AND MAINTENANCE GENERAL REQUIREMENTS.
2. INSPECTIONS ARE REQUIRED: 1) PRIOR TO POURING THRUST BLOCKS. 2) FOR HYDROSTATIC TESTING, AND 3) FOR FLUSH.
3. INSTALLATION, INSPECTION, AND TESTING SHALL CONFORM TO 2016 EDITIONS CFC, NFPA 13 AND NFPA 24.
4. PRIVATE FIRE HYDRANTS SHALL BE APPROVED WET BARREL STYLE WITH A MINIMUM OF ONE 2 1/2" AND ONE 4" OUTLET. THE 4" OUTLET SHALL FACE THE FIRE DEPARTMENT ACCESS ROAD. ALL OUTLETS SHALL BE PROVIDED WITH NATIONAL STANDARD THREADS (NST). NFPA 24, 7.1.1.2.
5. FIRE HYDRANT SUPPLY PIPING SHALL BE A MINIMUM OF SIX INCHES IN DIAMETER. THE CENTER OF THE HOSE OUTLET SHALL BE NOT LESS THAN 18" ABOVE FINAL GRADE OR, WHERE LOCATED IN A HOSE HOUSE, 12" ABOVE THE FLOOR. NFPA 24, 7.1.1 & 7.3.3.
6. FIRE HYDRANTS SHALL BE A MINIMUM OF 40 FEET FROM ALL STRUCTURES. NFPA 24, 7.2.3.
7. A KEYED GATE VALVE SHALL BE PROVIDED FOR EACH HYDRANT IN AN ACCESSIBLE LOCATION. VALVES SHALL NOT BE LOCATED IN PARKING STALLS. NFPA 24, 7.1.1.1
8. ALL PIPING SHALL BE LISTED FOR USE IN FIRE PROTECTION SERVICE AND COMPLY WITH AWWA STANDARDS (CLASS 150 MINIMUM) CLASS 200 PIPE SHALL BE USED WHERE THE PRESSURE MAY EXCEED 150 PSI. NFPA 24, 10.1.1
9. ALL BOLTED JOINTS SHALL BE CLEANED AND THOROUGHLY COATED WITH ASPHALT OR OTHER CORROSION RETARDING MATERIAL AFTER INSTALLATION. NFPA 24, 10.4.1.1
10. BACKFILL SHALL BE WELL TAMPED LAYERS TO CONSIST OF 6" MINIMUM BED OF CLEAN FILL SAND OR PEA GRAVEL BELOW AND 12" ABOVE THE PIPE (TOTAL 18" MINIMUM). NFPA 24, 10.9.1.
11. FITTINGS SHALL BE OF AN APPROVED TYPE. NFPA 24, 10.2.1.
12. A MINIMUM OF 30" OF COVER, FROM FINISH GRADE TO THE TOP OF THE PIPE, SHALL BE PROVIDED. WHEN SURFACE LOADS ARE EXPECTED, A MINIMUM OF 36" COVER SHALL BE PROVIDED. NFPA 24, 10.4.2.2.2 &.3
13. THRUST BLOCKS, OR OTHER APPROVED METHOD OF THRUST RESTRAINT, SHALL BE PROVIDED WHEREVER PIPE CHANGES DIRECTION. BACK-FILL BETWEEN THE JOINTS TO PREVENT MOVEMENT OF THE PIPE. PROVIDE DETAILS AND CALCULATIONS FOR SIZING THRUST BLOCKS BASE ON ACTUAL SOIL CONDITIONS. NFPA 24, 10.6.
14. A HYDROSTATIC TEST (200 PSI FOR TWO HOURS OR 50 PSI OVER MAXIMUM STATIC PRESSURE, WHICHEVER IS GREATER) SHALL BE PERFORMED. NFPA 24, 10.10.2.2.1.
15. THE SYSTEM SHALL BE THOROUGHLY FLUSHED BEFORE CONNECTION IS MADE TO OVERHEAD PIPING. FLOW SHALL BE THROUGH A MINIMUM OF 4" HOSE OF PIPE. NFPA 24, 10.10.2.1.
16. ALL CONTROL VALVES SHALL BE LOCKED IN THE OPEN POSITION. VALVES SHALL BE MONITORED IF THEY SERVE 6 OR MORE SPRINKLER HEADS. CBC/CFC 903.4.
17. ALL CONTROL VALVES SHALL BE LISTED INDICATING TYPE UNLESS A NON-INDICATING VALVE, SUCH AS AN UNDERGROUND GATE VALVE WITH APPROVED ROADWAY BOX COMPLETE WITH T-WRENCH, IS ACCEPTABLE TO AUTHORITY HAVING JURISDICTION (AHJ). NFPA 24, 6.1.1.
18. POST INDICATING VALVES (PIV) SHALL BE TESTED TO INSURE THAT THE "TARGETS" (OPEN, CLOSED) ARE CLEARLY IDENTIFIED WHEN VALVE IS OPENED AND CLOSED. NFPA 24, 10.10.1 & 14.1.
19. TESTS SHALL BE MADE BY THE INSTALLING CONTRACTOR IN THE PRESENCE OF THE (AHJ). PROVIDE A COMPLETED CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR UNDERGROUND PIPING TO DSA. NFPA 24, 10.10.1 & 14.1, CFC 901.5 & 6.
20. ALL FIRE HYDRANTS SHALL HAVE A 3-FOOT CIRCUMFERENCE OF CLEAR SPACE AND AN 18 INCH CLEARANCE FROM THE CENTER OF THE 4½" DISCHARGE TO FINISHED GRADE LEVEL. CFC 507.5.5
21. THE POST INDICATOR VALVES (PIV) SHALL BE SET SO THAT THE TOP OF THE POST WILL BE 32" TO 40" ABOVE FINISHED GRADE. NFPA 24, 6.3.1
22. ALL FIRE HYDRANTS SHALL BE INSTALLED WITH BREAK-OFF BOLTS AND/OR BREAK-OFF SPOOLS.
23. ALL MECHANICAL JOINTS ON FIRE SERVICE LINES AND FIRE SPRINKLER LATERALS SHALL BE CLEANED AND THOROUGHLY COATED WITH CORROSION RETARDING MATERIAL. NFPA 24, 10.4.1.1



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KEYNOTES

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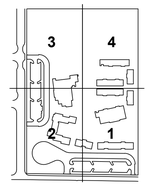

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
WATER & COMPOSITE UTILITY PLAN

DSA SUBMITTAL

DATE: **12/09/2025**
CLIENT PROJ NO:
SHEET:

C8.0.1

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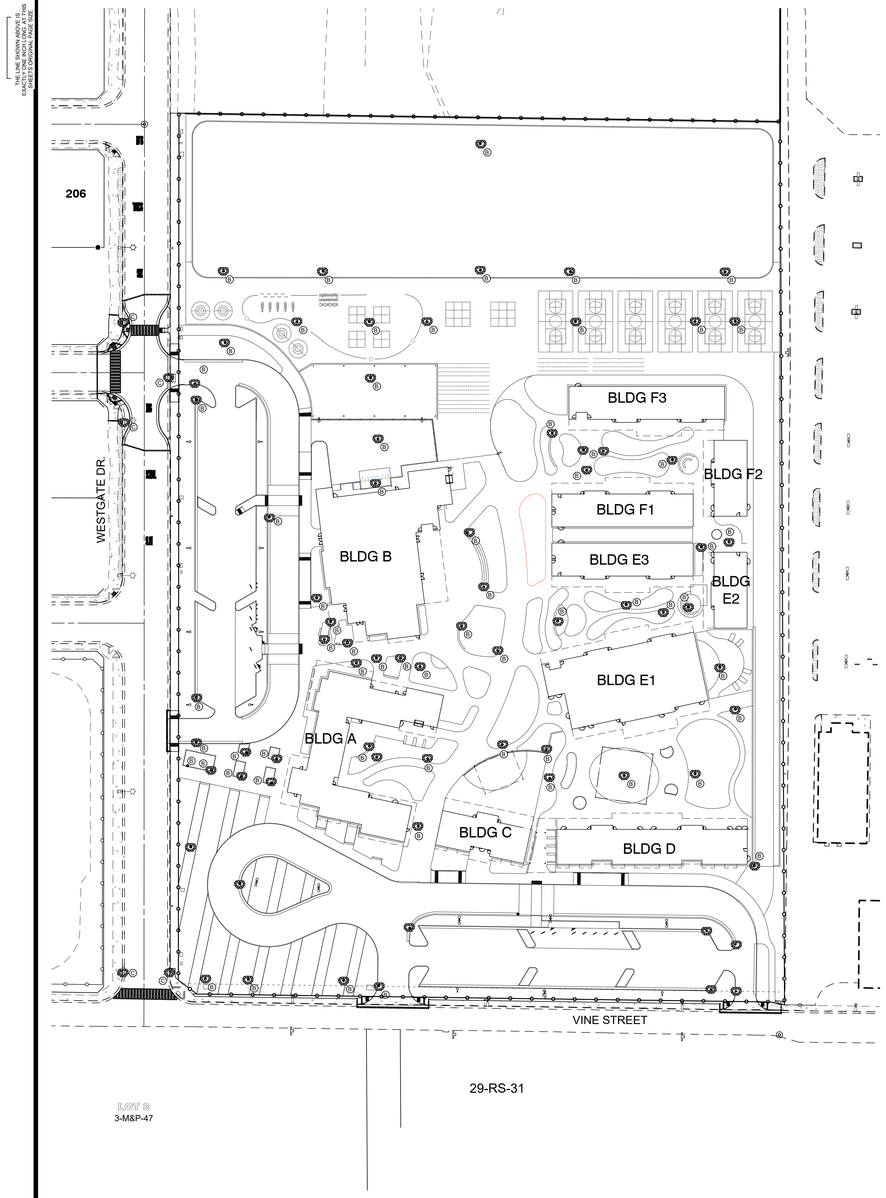
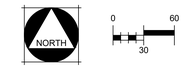


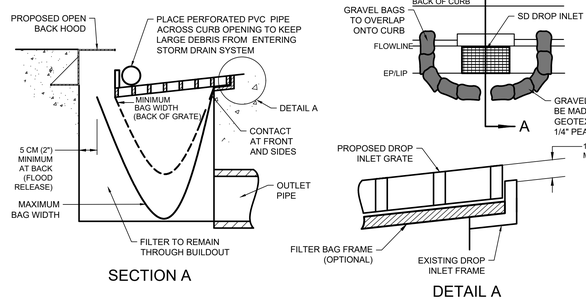


LEGEND

STABILIZED CONSTRUCTION ENTRANCE (TC-1)	EXISTING CURB INLET
STRAW ROLLS (SE-5)	CURB INLET
SILT FENCE (SE-1)	CATCH BASIN
DESIGNATED ENTRANCE/OUTLET TIRE WASH (TC-3)	PROPOSED: CURB INLET SEDIMENT PROTECTION (SE-10, SEE DETAIL A)
DESIGNATED VEHICLE MAINTENANCE AREA (NS-8, NS-9, NS-10)	PROPOSED: DRAIN INLET SEDIMENT PROTECTION (SE-10, SEE DETAIL B)
DESIGNATED CONCRETE WASHOUT AREA (WM-8)	EXISTING: CURB INLET SEDIMENT PROTECTION (SE-10, SEE DETAIL C)
DESIGNATED JOB TRAILER & LAYDOWN AREA (WM-1)	GRAVEL BAGS

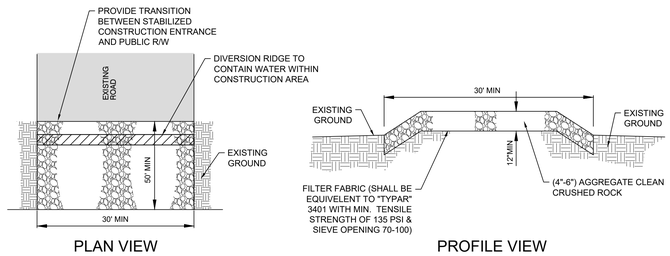
STORM DRAIN INLET FILTER BAG

1. GRAVEL BAGS SHALL BE WOVEN GEOTEXTILE FABRIC
2. CONSTRUCT ON GENTLY SLOPING STREETS WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE OUT OF SUSPENSION.
3. LEAVE A GAP OF ONE BAG IN THE MIDDLE OF THE TOP ROW OF BAGS TO SERVE AS THE SPILLWAY. SPILLWAY HEIGHT SHALL BE LOWER THAN CURB HEIGHT & SUFFICIENT IN SIZE TO PASS FLOWS FROM SEVERE STORM EVENT.
4. PLACE 2 LAYERS OF GRAVEL BAGS OVER LAPPING BAGS AND PACK THEM TIGHTLY TOGETHER TO MINIMIZE THE SPACE BETWEEN BAGS. FILL BAG WITH 1/4" PEA GRAVEL
5. INSPECT & REPAIR FILTERS AFTER EA. STORM EVENT. REMOVE SEDIMENT WHEN 1/2 OF THE FILTER DEPTH HAS BEEN FILLED. REMOVED SEDIMENT SHALL BE DEPOSITED IN AN AREA TRIBUTARY TO A SEDIMENT BASIN OR OTHER FILTERING MEASURE.
6. SEDIMENT & GRAVEL SHALL BE IMMEDIATELY REMOVED FROM TRAVELED WAY OF ROAD.
7. GRAVEL BAG INLET PROTECTION ON ROADS OPEN TO PUBLIC WILL REQUIRE DELINEATION DEVICES TO ALERT MOTORISTS, BICYCLISTS AND PEDESTRIANS. THE USE OF SUCH DEVICES SHALL BE SUBJECT TO THE RESIDENT ENGINEERS APPROVAL.



A STORM DRAIN CURB INLET FILTER BAG DETAIL (SE-10)

NOT TO SCALE



1 STABILIZED CONSTRUCTION ENTRANCE (TC-1)

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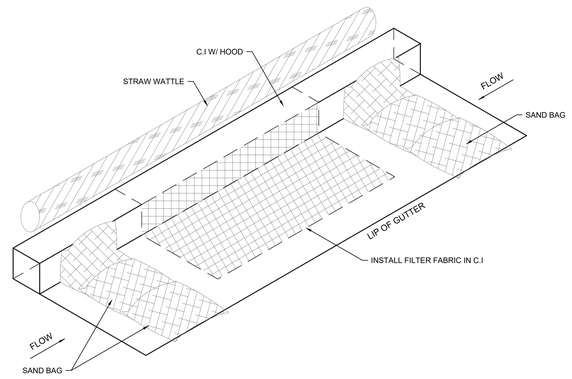
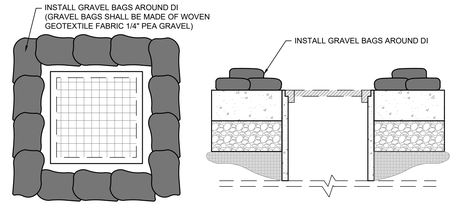


C EXISTING CURB INLET FILTER DETAIL (SE-10)

NOT TO SCALE



B STORM DRAIN INLET FILTER BAG DETAIL (SE-10)

NOT TO SCALE

GENERAL NOTES

1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE EFFECTIVE FOR THE DURATION OF THE CONSTRUCTION ACTIVITY.
2. NO STORM RUNOFF WATER SHALL BE ALLOWED TO DRAIN DIRECTLY INTO THE EXISTING UNDERGROUND STORM SYSTEM BEFORE THE ON-SITE STORM DRAIN SYSTEM, LANDSCAPE, AND PAVING IS INSTALLED AND COMPLETED.
3. AS SOON AS IS PRACTICAL AFTER THE NEW ON-SITE STORM DRAIN SYSTEM IS INSTALLED, THE CATCH BASINS SHALL BE INSTALLED AND GRAVEL BAGS AND SCREENS SHALL BE PLACED AROUND THE CATCH BASINS, AS SHOWN. THE CONTRACTOR SHALL HAVE AN OPTION TO INSTALL PREFABRICATED STEEL FRAMES WITH FILTER SCREEN OF FILTER FABRIC ATTACHED TO THE FRONT OF THE DRAIN INLET AND EXTEND 12 INCHES (12") ON EACH SIDE OF THE DRAIN INLET OPENING. FRAME SHALL BE APPROVED BY THE CITY ENGINEER AND SHALL FIT THE OPENING WITH LESS THAN ONE-QUARTER INCH (1/4") GAP AT ANY ONE POINT.
4. THE NAME, ADDRESS AND 24-HOUR TELEPHONE NUMBER OF THE PERSON RESPONSIBLE FOR IMPLEMENTATION OF THE EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE PROVIDED.
5. A MINIMUM OF 50' OF DRAIN ROCK, 1-1/2" DIAMETER OR LARGER, AT A MINIMUM DEPTH OF 6", SHALL BE INSTALLED AT EACH DRIVEWAY ENTRANCE TO THE SITE. THIS DOES NOT NEED TO BE DONE AT DRIVEWAYS, WHICH WILL BE CLOSED BY IMMOVABLE BARRICADES DURING CONSTRUCTION.
6. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE MAINTAINED UNTIL DISTURBED AREAS ARE STABILIZED. CHANGES TO THE EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE MADE TO MEET FIELD CONDITIONS, BUT ONLY WITH THE APPROVAL OF OR AT THE DIRECTION OF THE CITY ENGINEER.
7. DURING THE RAINY SEASON ALL SIDEWALK AND PAVED AREAS SHALL BE KEPT CLEAR OF EARTH MATERIAL AND DEBRIS. THE SITE SHALL BE MAINTAINED SO AS TO MINIMIZE SEDIMENT LADEN RUNOFF FROM ENTERING ANY STORM DRAINAGE SYSTEM.
8. THE EROSION AND SEDIMENTATION CONTROL PLAN COVERS ONLY THE FIRST WINTER DURING WHICH CONSTRUCTION IS TO TAKE PLACE. PLANS ARE TO BE RESUBMITTED PRIOR TO SEPTEMBER 1 OF EACH SUBSEQUENT YEAR UNTIL THE CITY ACCEPTS THE SITE IMPROVEMENTS.
9. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSPECT AND REPAIR ALL EROSION CONTROL FACILITIES AT THE END OF EACH WORK DAY DURING THE RAINY SEASON.
10. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CLEAN OUT SEDIMENT BASINS WHENEVER THE LEVEL OF SEDIMENT REACHES THE SEDIMENT CLEAN OUT LEVEL INDICATED ON THE PLANS.
11. IT IS THE RESPONSIBILITIES OF THE CONTRACTOR TO PROTECT TEMPORARY BORROW AREAS AND/OR STOCKPILES WITH APPROPRIATE EROSION CONTROL MEASURES SATISFACTORY TO THE CITY ENGINEER.
12. THE CLEANING OF PAVED STREETS, DURING AND AT THE COMPLETION OF CONSTRUCTION, SHALL BE PERFORMED WITH MECHANICAL SWEEPERS. THE USE OF WATER TRUCKS TO "WASH DOWN" THE STREET IS PROHIBITED.
13. SEAL OR SKIRT BETWEEN TRAILER & GRADING TO PREVENT EXPOSURE TO DRAIN.
14. THE FOLLOWING PLANS ARE ACCURATE FOR EROSION CONTROL PURPOSES ONLY.
15. THE INFORMATION ON THIS PLAN IS INTENDED TO BE USED AS A GUIDELINE FOR THE CONTRACTOR AND SUBCONTRACTORS TO COMPLY WITH THE REQUIREMENTS OF THE STATE WATER RESOURCES CONTROL BOARD. FIELD CONDITIONS MAY NECESSITATE MODIFICATIONS TO THIS PLAN.
16. BMPS WM-5, NS-10, WM-6, AND TC-1 ARE SHOWN SCHEMATICALLY. THESE BMPS CAN BE MOVED TO FIT THE SITE CONSTRUCTION STAGING AS NEEDED BUT THEY SHALL REMAIN IN PLACE THROUGHOUT THE PROJECT CONSTRUCTION.

CONCRETE WASTE MANAGEMENT NOTES

CONCRETE SLURRY WASTES

1. PCC AND AC WASTE SHALL NOT BE ALLOWED TO ENTER STORM DRAINS OR WATERCOURSES.
2. PCC AND AC WASTE SHALL BE COLLECTED AND DISPOSED OF IN A TEMPORARY CONCRETE WASHOUT FACILITY.
3. A SIGN SHALL BE INSTALLED ADJACENT TO EACH TEMPORARY CONCRETE WASHOUT FACILITY TO INFORM CONCRETE EQUIPMENT OPERATORS TO UTILIZE THE PROPER FACILITIES.
4. DO NOT ALLOW SLURRY RESIDUE FROM WET CORING OR SAW-CUTTING AC OR PCC TO ENTER STORM DRAINS OR RECEIVING WATERS.
5. VACUUM SLURRY RESIDUE AND DISPOSE IN A TEMPORARY PIT AND ALLOW SLURRY TO DRY. DISPOSE OF DRY SLURRY RESIDUE IN ACCORDANCE WITH BMP WM-5.
6. COLLECT RESIDUE FROM GROOVING AND GRINDING OPERATIONS IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 42-1.02 AND 42-2.02, "CONSTRUCTION."

ON-SITE TEMPORARY CONCRETE WASHOUT FACILITY, TRANSIT TRUCK WASHOUT PROCEDURES

1. TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE LOCATED A MINIMUM OF 15 M (50 FT.) FROM STORM DRAIN INLETS, OPEN DRAINAGE FACILITIES, AND WATERCOURSES, UNLESS DETERMINED UNFEASIBLE BY THE ENGINEER. EACH FACILITY SHALL BE LOCATED AWAY FROM CONSTRUCTION TRAFFIC OR ACCESS AREAS TO PREVENT DISTURBANCE OR TRACKING.
2. A SIGN SHALL BE INSTALLED ADJACENT TO EACH WASHOUT FACILITY TO INFORM CONCRETE EQUIPMENT OPERATORS TO UTILIZE THE PROPER FACILITIES.
3. TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE CONSTRUCTED ABOVE GRADE. TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS.
4. TEMPORARY WASHOUT FACILITIES SHALL HAVE A TEMPORARY PIT OR BERMED AREAS OF SUFFICIENT VOLUME TO COMPLETELY CONTAIN ALL LIQUID AND WASTE CONCRETE MATERIALS GENERATED DURING WASHOUT PROCEDURES.
5. PERFORM WASHOUT OF CONCRETE TRUCKS IN DESIGNATED AREAS ONLY.
6. ONCE CONCRETE WASTES ARE WASHED INTO THE DESIGNATED AREA AND ALLOWED TO HARDEN, THE CONCRETE SHALL BE BROKEN UP, REMOVED, AND DISPOSED. DISPOSE OF HARDENED CONCRETE ON A REGULAR BASIS.

TEMPORARY CONCRETE WASHOUT FACILITY (TYPE ABOVE GRADE)

1. TEMPORARY CONCRETE WASHOUT FACILITY (TYPE ABOVE GRADE) SHALL BE CONSTRUCTED AS SHOWN ON THE PLANS, WITH A RECOMMENDED MINIMUM LENGTH AND MINIMUM WIDTH OF 3 M (10 FEET), BUT WITH SUFFICIENT QUANTITY AND VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS. THE LENGTH AND WIDTH OF A FACILITY MAY BE INCREASED, AT THE CONTRACTOR'S EXPENSE, UPON APPROVAL OF THE ENGINEER.
2. PLASTIC LINING MATERIAL SHALL BE A MINIMUM OF 60 ML POLYETHYLENE SHEETING AND SHALL BE FREE OF HOLES, TEARS OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL.

REMOVAL OF TEMPORARY CONCRETE WASHOUT FACILITIES

1. WHEN TEMPORARY CONCRETE WASHOUT FACILITIES ARE NO LONGER REQUIRED FOR THE WORK, AS DETERMINED BY THE ENGINEER, THE HARDENED CONCRETE SHALL BE REMOVED AND DISPOSED OF. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BECOME THE PROPERTY OF THE CONTRACTOR, SHALL BE REMOVED FROM THE SITE OF THE WORK, AND SHALL BE DISPOSED OF.
2. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCE CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE BACKFILLED AND REPAIRED IN CONFORMANCE WITH THE PROJECT SPECIFICATIONS.
3. THE CONTRACTOR'S WASTE POLLUTION CONTROL MANAGER (WPCM) SHALL MONITOR ON SITE CONCRETE WASTE STORAGE AND DISPOSAL PROCEDURES AT LEAST WEEKLY.
4. THE WPCM SHALL MONITOR CONCRETE WORKING TASKS, SUCH AS SAW CUTTING, CORING, GRINDING AND GROOVING AT LEAST WEEKLY TO ENSURE PROPER METHODS ARE EMPLOYED.
5. TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE MAINTAINED TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM FREEBOARD OF 4" FOR ABOVE GRADE FACILITIES AND 12" FOR BELOW GRADE FACILITIES. MAINTAINING TEMPORARY CONCRETE WASHOUT FACILITIES SHALL INCLUDE REMOVING AND DISPOSING OF HARDENED CONCRETE AND RETURNING THE FACILITIES TO A FUNCTIONAL CONDITION. HARDENED CONCRETE MATERIALS SHALL BE REMOVED AND DISPOSED OF IN CONFORMANCE WITH THE PROVISIONS IN SECTION 15-3.02, "REMOVAL METHODS", OF THE STANDARD SPECIFICATIONS.
6. EXISTING FACILITIES MUST BE CLEANED, OR NEW FACILITIES MUST BE CONSTRUCTED AND READY FOR USE ONCE THE WASHOUT IS 75% FULL.

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REGISTERED PROFESSIONAL ENGINEER — KENNETH T. SMITH — No. C077439 — CIVIL — STATE OF CALIFORNIA

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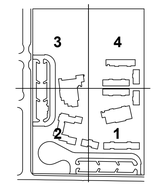

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
EROSION & SEDIMENT CONTROL PLAN

DSA SUBMITTAL

DATE: **12/09/2025**
CLIENT PROJ NO:
SHEET:

C9.0.1

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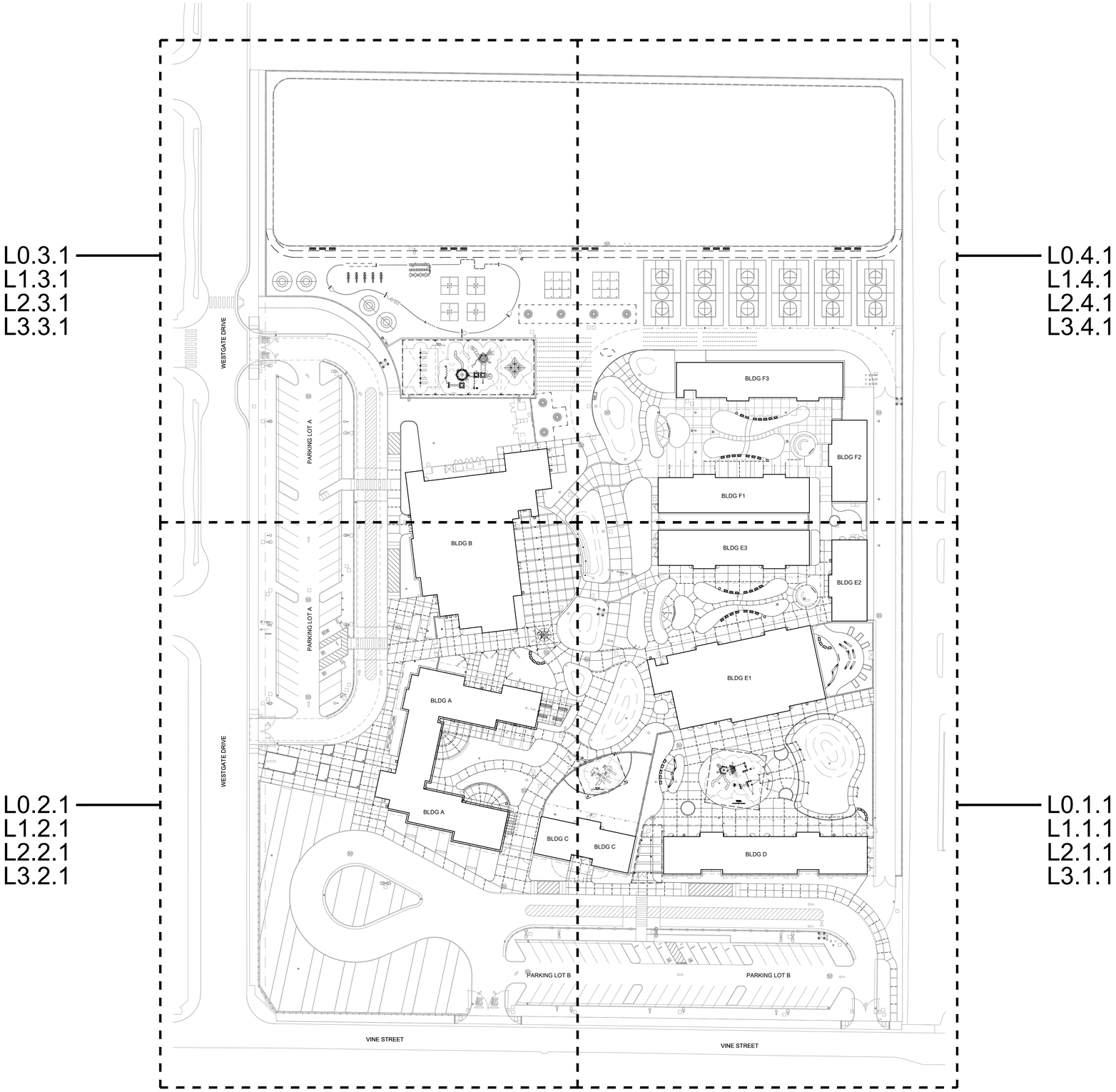

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SCALE: 1"= 40'-0"

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2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
OVERALL LANDSCAPE SITE PLAN

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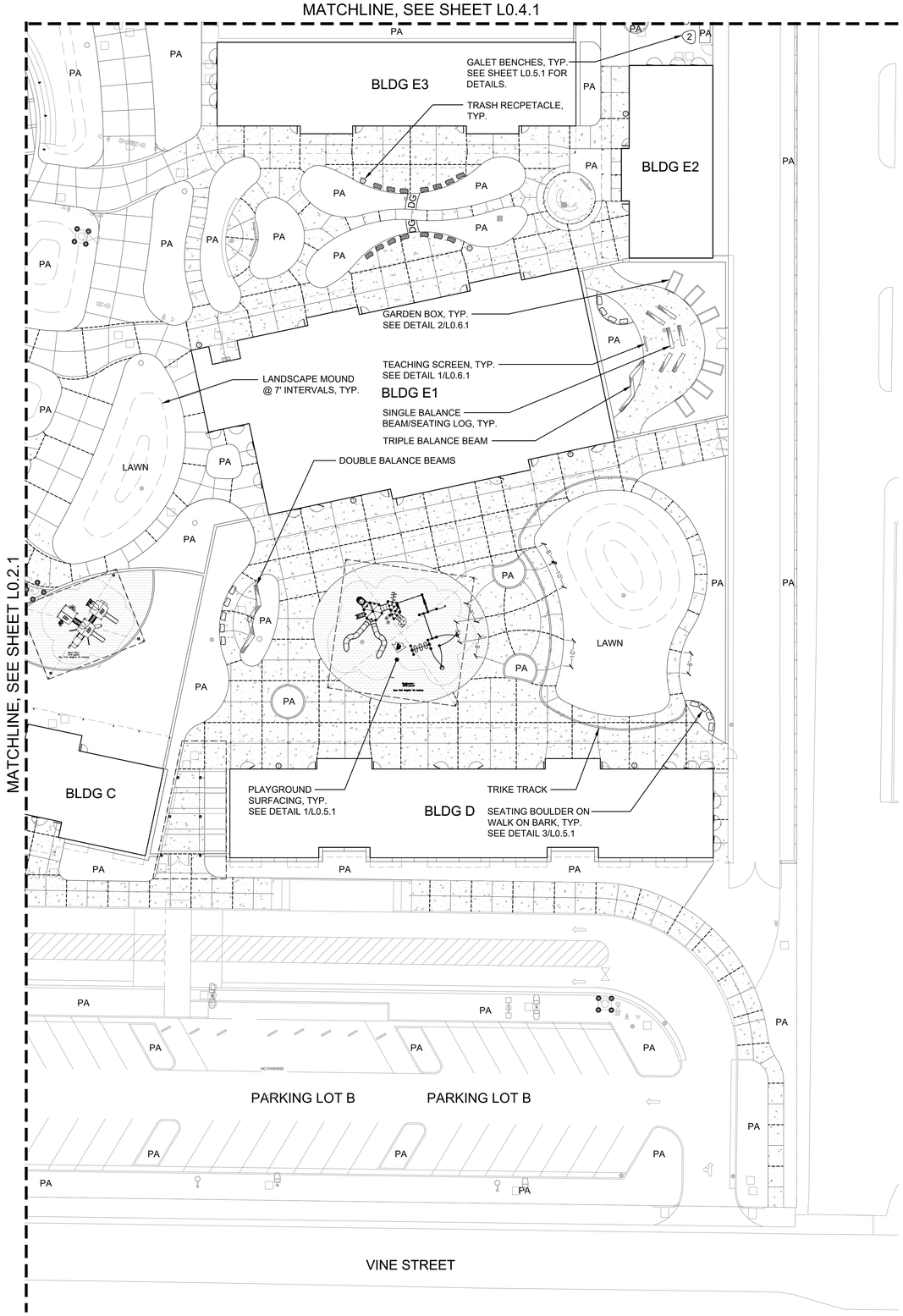


KEY / SITE LEGEND

PA — DENOTES PLANTER AREA

DG — DENOTES DECOMPOSED GRANITE

CONCRETE PAVEMENT
SEE CIVIL PLANS.
CONTROL JOINTS
EXPANSION JOINTS

ACCENT PAVEMENT
COLOR: DAVIS COLOR, ---- #XXXX
FINISH: LIGHT SALT FINISH
SCORING PATTERN AS SHOWN

PLAYGROUND SURFACING
MANUFACTURER: FOREVERLAWN
PRODUCT: PLAYGROUND GRASS
SEE DETAIL 1/L0.5.1

PLAYGROUND STRUCTURES
1. 5-12 PLAY STRUCTURE, ROSS RECREATION (SEE CUTSHEETS)
2. KINDER PLAY STRUCTURE, ROSS RECREATION (SEE CUTSHEETS)
3. TK PLAY STRUCTURE, ROSS RECREATION (SEE CUTSHEETS)

MANUFACTURER: LANDSCAPE STRUCTURES

SEATING BOULDERS ON WALK ON BARK (13 TOTAL)
SEE DETAIL 2/L0.5.1

SEATING BOULDERS ON CONCRETE (33 TOTAL)
SEE DETAIL 3/L0.5.1

ROUND TREE GRATE AND STAKE SYSTEM (7 TOTAL)
MANUFACTURER: IRONSMITH
PRODUCT: OLYMPIAN CAST IRON ROUND GRATE WITH BAKED ON OIL FINISH
MODEL#: 9615
SIZE: 96" DIA.
SEE DETAIL 4/L0.5.1

STAKE SYSTEM: GRATE STAKE, 6 FT LONG FOR 24" BOX SIZE TREES
MANUFACTURER: J.R. PARTNERS
PRODUCT: BLACK POWDER COAT
INSTALL PER MANUFACTURERS INSTRUCTIONS
SEE DETAIL 5/L0.5.1

GALET BENCHES
MANUFACTURER: WASAU TILE
MODEL(S): GALET COLLECTION, (4) ZB.GL01, (3) ZB.GL.02, (3) ZB.GL.03
COLOR/FINISH: W33 MISTY GRAY/WEATHERSTONE
PLACEMENT: AS DIRECTED ON-SITE
FASTENING: NONE
SEE DETAILS 6.7, & 8/L0.5.1

TRIPLE BALANCE BEAMS (1 TOTAL)
MANUFACTURER: KOMPAN
MODEL#: NRO889
SIZE: 24'-8"L X 6"W X 1'-3"H
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

DOUBLE BALANCE BEAM (2 TOTAL)
MANUFACTURER: KOMPAN
MODEL#: NRO888
SIZE: 16'-1"L X 6"W X 1'-3"H
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

SINGLE BALANCE BEAM/SEATING LOG (6 TOTAL)
MANUFACTURER: KOMPAN
MODEL#: NRO887
SIZE: 10'-2"L X 6"W X 1'-3"H
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

TEACHING SCREEN (5 TOTAL)
COLOR: COORDINATE WITH OWNER
FINISH: POWDERCOAT
SEE DETAIL 1/L0.6.1

GARDEN BOX (6 TOTAL)
SEE DETAIL 2/L0.6.1

BIKE RACKS
MANUFACTURER: WILLYGOAT
PRODUCT: TRADITIONAL DOUBLE SIDED BICYCLE RACK
SKU: 5905SM
16-BIKE CAPACITY (3 TOTAL)
20-BIKE CAPACITY (1 TOTAL)
4' CLEARANCE
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

BIKE LOCKERS (8 TOTAL)
MANUFACTURER: AMERICAN BICYCLE SECURITY COMPANY
PRODUCT: BIKE-SHELL MODEL 301
SIZE: 74"L X 30"W X 48"H
5' CLEARANCE FOR DOOR
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

TRASH RECEPTACLE (22 TOTAL)
MANUFACTURER: BELSON OUTDOORS
PRODUCT: MODERN TWO-WAY DISPOSAL, 53 GALLON ROUND RECEPTACLE
MODEL#: TF1130
SIZE: 26" DIA. X 49"H
FNISH/COLOR: WEATHERSTONE/GRAY
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

CONCRETE MOWSTRIP
SEE DETAIL 9/L0.5.1

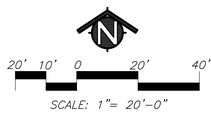
REDWOOD HEADERBOARD
SEE DETAIL 10/L0.5.1

BENCHES (15 TOTAL)
MANUFACTURER: ANOVA SITE FURNISHINGS
PRODUCT: INFINITY POWDERCOATED LINEAR BENCH, RECYCLED PLASTIC
MODEL#: PINF24L6R
SIZE: 72"L X 24"W X 19"H
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

DRINKING FOUNTAIN (2 TOTAL)
MANUFACTURER: ELKAY
PRODUCT: OUTDOOR EZH2O LOWER BOTTLE FILLING STATION TRI-LEVEL PEDESTAL
MODEL#: LK4430BF1L
COLOR: EVERGREEN
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

SUN DIAL
SEE DETAIL 3/L0.6.1

SILVA CELL SYSTEM
MANUFACTURER: DEEPROOT
PRODUCT: 2X SYSTEM HEIGHT
INSTALL PER MANUFACTURERS INSTRUCTIONS.
SEE DETAIL 4/L0.6.1



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LANDSCAPE SITE PLAN

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

L0.1.1

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THE LINE BROWN ABOVE IS EXACTLY 1" WHEN PRINTED ON ARCH D SHEETS ORIGINAL PAGE SIZE

KEY / SITE LEGEND

PA — DENOTES PLANTER AREA

DG — DENOTES DECOMPOSED GRANITE

CONCRETE PAVEMENT
SEE CIVIL PLANS.
CONTROL JOINTS
EXPANSION JOINTS

ACCENT PAVEMENT
COLOR: DAVIS COLOR, ---- #XXXX
FINISH: LIGHT SALT FINISH
SCORING PATTERN AS SHOWN

PLAYGROUND SURFACING
MANUFACTURER: FOREVERLAWN
PRODUCT: PLAYGROUND GRASS
SEE DETAIL 1/L0.5.1

PLAYGROUND STRUCTURES
1. 5-12 PLAY STRUCTURE, ROSS RECREATION (SEE CUTSHEETS)
2. KINDER PLAY STRUCTURE, ROSS RECREATION (SEE CUTSHEETS)
3. TK PLAY STRUCTURE, ROSS RECREATION (SEE CUTSHEETS)

MANUFACTURER: LANDSCAPE STRUCTURES

SEATING BOULDERS ON WALK ON BARK (13 TOTAL)
SEE DETAIL 2/L0.5.1

SEATING BOULDERS ON CONCRETE (33 TOTAL)
SEE DETAIL 3/L0.5.1

ROUND TREE GRATE AND STAKE SYSTEM (7 TOTAL)
MANUFACTURER: IRONSMITH
PRODUCT: OLYMPIAN CAST IRON ROUND GRATE WITH BAKED ON OIL FINISH
MODEL#: 9615
SIZE: 96" DIA.
SEE DETAIL 4/L0.5.1

STAKE SYSTEM: GRATE STAKE, 6 FT LONG FOR 24" BOX SIZE TREES
MANUFACTURER: J.R. PARTNERS
PRODUCT: BLACK POWDER COAT
INSTALL PER MANUFACTURERS INSTRUCTIONS
SEE DETAIL 5/L0.5.1

GALET BENCHES
MANUFACTURER: WASAU TILE
MODEL(S): GALET COLLECTION, (4) ZB.GL01, (3) ZB.GL.02, (3) ZB.GL.03
COLOR/FINISH: W33 MISTY GRAY/WEATHERSTONE
PLACEMENT: AS DIRECTED ON-SITE
FASTENING: NONE
SEE DETAILS 6.7, & 8/L0.5.1

TRIPLE BALANCE BEAMS (1 TOTAL)
MANUFACTURER: KOMPAN
MODEL#: NRO889
SIZE: 24'-8"L X 6"W X 1'-3"H
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

DOUBLE BALANCE BEAM (2 TOTAL)
MANUFACTURER: KOMPAN
MODEL#: NRO888
SIZE: 16'-1"L X 6"W X 1'-3"H
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

SINGLE BALANCE BEAM/SEATING LOG (6 TOTAL)
MANUFACTURER: KOMPAN
MODEL#: NRO887
SIZE: 10'-2"L X 6"W X 1'-3"H
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

TEACHING SCREEN (5 TOTAL)
COLOR: COORDINATE WITH OWNER
FINISH: POWDERCOAT
SEE DETAIL 1/L0.6.1

GARDEN BOX (6 TOTAL)
SEE DETAIL 2/L0.6.1

BIKE RACKS
MANUFACTURER: WILLYGOAT
PRODUCT: TRADITIONAL DOUBLE SIDED BICYCLE RACK
SKU: 5905SM
16-BIKE CAPACITY (3 TOTAL)
20-BIKE CAPACITY (1 TOTAL)
4' CLEARANCE
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

BIKE LOCKERS (8 TOTAL)
MANUFACTURER: AMERICAN BICYCLE SECURITY COMPANY
PRODUCT: BIKE-SHELL MODEL 301
SIZE: 74"L X 30"W X 48"H
5' CLEARANCE FOR DOOR
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

TRASH RECEPTACLE (22 TOTAL)
MANUFACTURER: BELSON OUTDOORS
PRODUCT: MODERN TWO-WAY DISPOSAL, 53 GALLON ROUND RECEPTACLE
MODEL#: TF1130
SIZE: 26" DIA. X 49"H
FINISH/COLOR: WEATHERSTONE/GRAY
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

CONCRETE MOWSTRIP
SEE DETAIL 9/L0.5.1

REDWOOD HEADERBOARD
SEE DETAIL 10/L0.5.1

BENCHES (15 TOTAL)
MANUFACTURER: ANOVA SITE FURNISHINGS
PRODUCT: INFINITY POWDERCOATED LINEAR BENCH, RECYCLED PLASTIC
MODEL#: PINF24L6R
SIZE: 72"L X 24"W X 19"H
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

DRINKING FOUNTAIN (2 TOTAL)
MANUFACTURER: ELKAY
PRODUCT: OUTDOOR EZH2O LOWER BOTTLE FILLING STATION TRI-LEVEL PEDESTAL
MODEL#: LK4430BF1L
COLOR: EVERGREEN
CONTRACTOR TO INSTALL PER MANUFACTURERS INSTRUCTIONS.

SUN DIAL
SEE DETAIL 3/L0.6.1

SILVA CELL SYSTEM
MANUFACTURER: DEEPROOT
PRODUCT: 2X SYSTEM HEIGHT
INSTALL PER MANUFACTURERS INSTRUCTIONS.
SEE DETAIL 4/L0.6.1

20' 10' 0 20' 40'
SCALE: 1"= 20'-0"

AGENCY APPROVAL:

LODI USD

HMC DESIGN FOR GOOD Architects
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SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

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Δ DESCRIPTION DATE

KEYNOTES

NOTES

25-31

MTW group
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2707 K Street, Suite 201
Sacramento, CA 95816
916 369-3990

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

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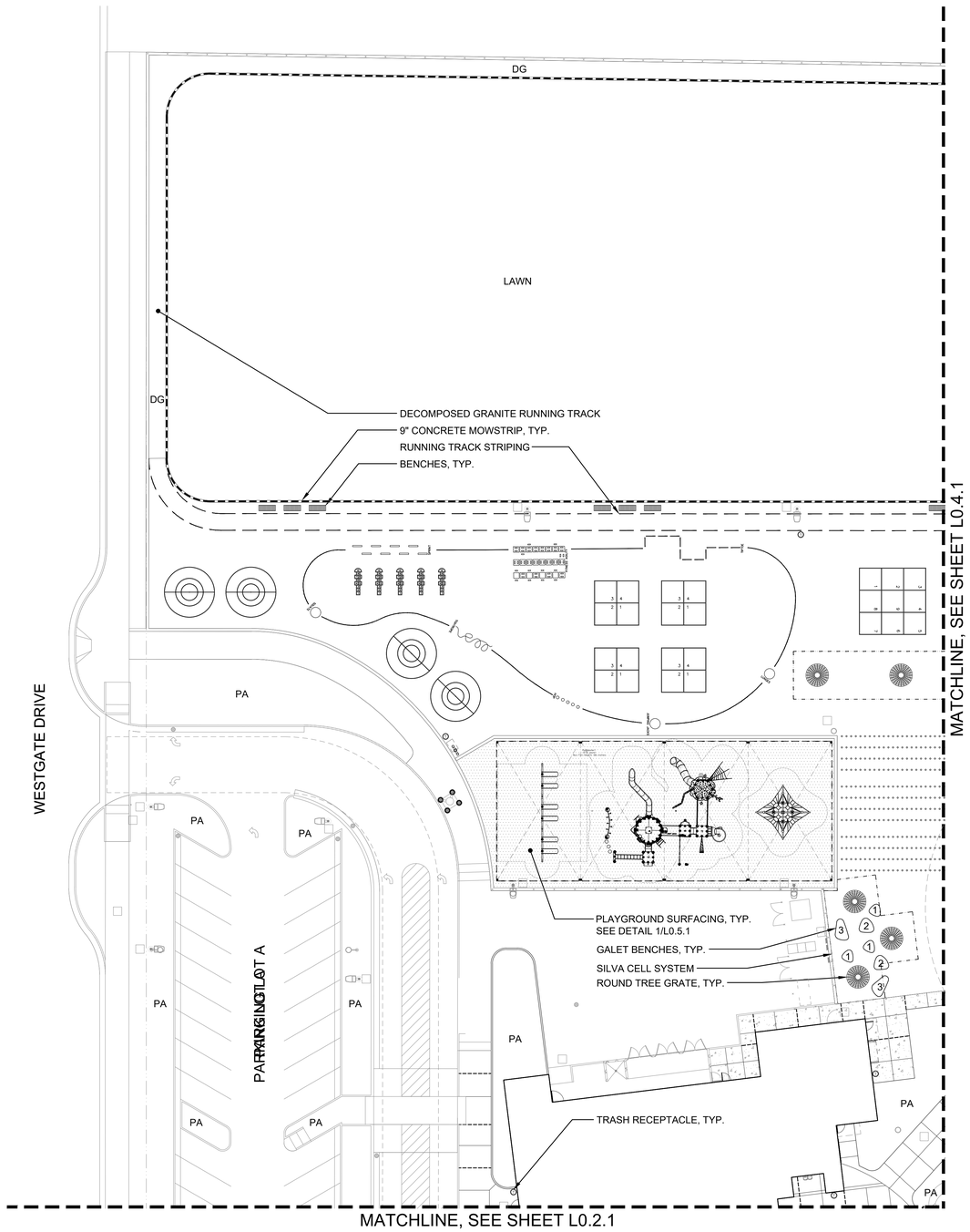

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SEE CIVIL PLANS.
CONTROL JOINTS
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SEE DETAIL 4/L0.5.1

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PLACEMENT: AS DIRECTED ON-SITE
FASTENING: NONE
SEE DETAILS 6.7, & 8/L0.5.1

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MANUFACTURER: KOMPAN
MODEL#: NRO889
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COLOR: COORDINATE WITH OWNER
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SEE DETAIL 1/L0.6.1

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SKU: 5905SM
16-BIKE CAPACITY (3 TOTAL)
20-BIKE CAPACITY (1 TOTAL)
4' CLEARANCE
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MANUFACTURER: AMERICAN BICYCLE SECURITY COMPANY
PRODUCT: BIKE-SHELL MODEL 301
SIZE: 74"L X 30"W X 48"H
5' CLEARANCE FOR DOOR
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MODEL#: LK4430BF1L
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LODI USD

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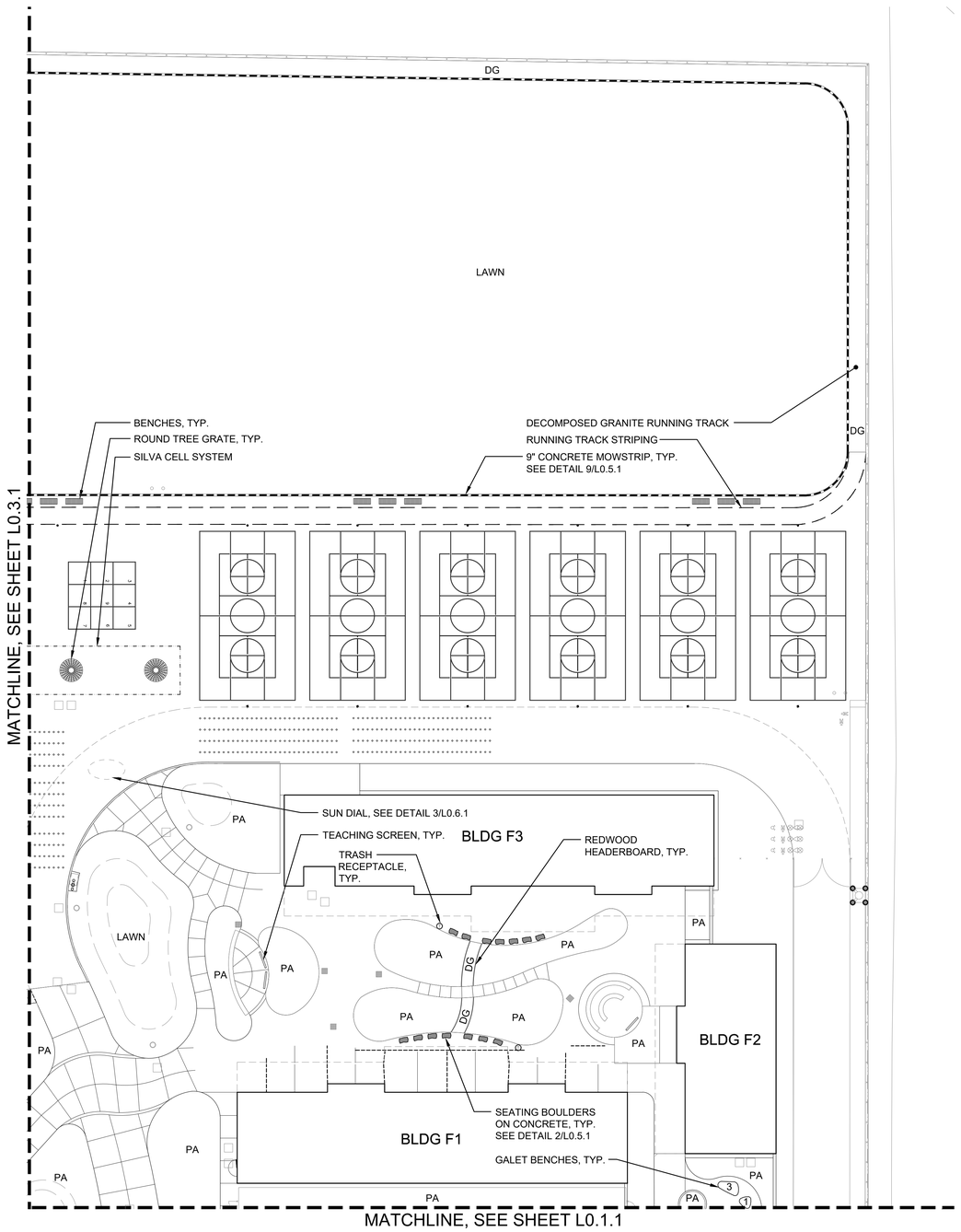

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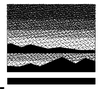

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REGISTERED LANDSCAPE ARCHITECT 5453 — 12/03/25 — 7/31/27 — STATE OF CALIFORNIA

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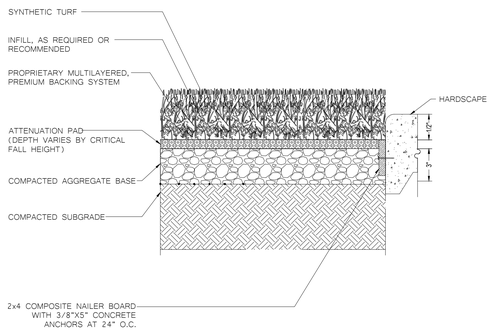
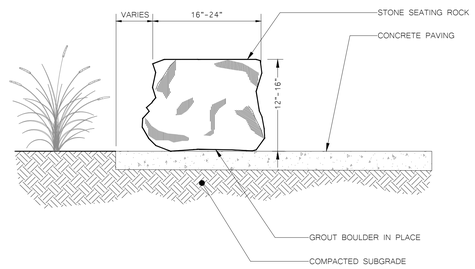


1 PLAYGROUND GRASS SYSTEM BY FOREVER LAWN

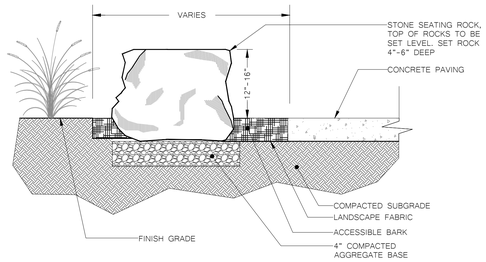
NOTES:
1. ALL ROCKS SHALL BE PROVIDED BY MONTANA ROCKWORK OR APPROVED EQUAL.
2. ROCK TO BE SET AT A DEPTH OF APPROXIMATELY 6". ROCK MAY BE PLACED LOWER TO ACHIEVE THE DESIRED SITTING HEIGHT.
3. ACTUAL ROCK TYPE, SIZE AND COLOR SUBJECT TO APPROVAL BY LANDSCAPE ARCHITECT. CONTACT AND SCHEDULE MEETING FOR BOULDER SELECTION PRIOR TO PURCHASING.



SECTION

2 SEATING BOULDER ON CONCRETE DETAIL

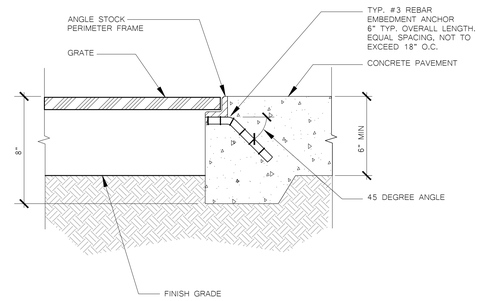
NOTES:
1. ALL ROCKS SHALL BE PROVIDED BY _____ AND ARE SUBJECT TO APPROVAL OF LANDSCAPE ARCHITECT, CONTACT _____, XXX-XXX-XXXX FOR ORDERING.
2. ROCK TO BE SET AT A DEPTH OF 4"-6". ROCK MAY BE PLACED LOWER TO ACHIEVE THE DESIRED SITTING HEIGHT.
3. ROCKS TO BE SPACED 6"-8" BETWEEN ONE ANOTHER WHEN PLACED IN GROUPINGS PER THE LANDSCAPE PLAN. TOP OF ROCKS TO BE SET LEVEL.
4. ACTUAL ROCK TYPE, SIZE AND COLOR SUBJECT TO APPROVAL BY LANDSCAPE ARCHITECT. CONTACT AND SCHEDULE MEETING FOR BOULDER SELECTION PRIOR TO PURCHASING.
3. LANDSCAPE ELEMENT NOT PART OF DSA APPROVAL.



SECTION

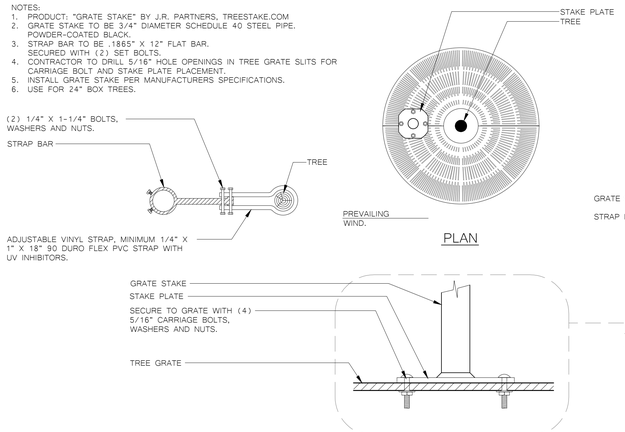
3 SEATING BOULDER ON WALK ON BARK DETAIL

NOTE:
1. PRODUCT: OLYMPIAN 8' RADIUS TREE GRATE BY IRONSMITH. GRATES TO BE CAST IRON MATERIAL WITH BAKED ON OIL FINISH.
2. INSTALL TREE GRATE FRAME PER MANUFACTURERS SPECIFICATIONS FOR TYPE "S" EMBED FRAME TYPE.
3. CONTRACTOR TO EXCAVATE COMPACTED NON-NATIVE SOIL, BASE ROCK, AND ANY OTHER DEBRIS DOWN TO A 24" MINIMUM DEPTH TO NATIVE UNCOMPACTED SOIL. REINSTALL NATIVE OR IMPORTED TOPSOIL ONCE FLATWORK IS COMPLETED. SCARIFY THE NATIVE SOIL AT THE BOTTOM AND SIDES OF TREE PIT PRIOR TO PLANTING.



4 TREE GRATE FRAME DETAIL

NOTES:
1. PRODUCT: "GRATE STAKE" BY J.R. PARTNERS, TREESTAKE.COM
2. GRATE STAKE TO BE 3/4" DIAMETER SCHEDULE 40 STEEL PIPE, POWDER-COATED BLACK.
3. STRAP BAR TO BE .1865" X 12" FLAT BAR. SECURED WITH (2) SET BOLTS.
4. CONTRACTOR TO DRILL 5/16" HOLE OPENINGS IN TREE GRATE SLITS FOR CARRIAGE BOLT AND STAKE PLATE PLACEMENT.
5. INSTALL GRATE STAKE PER MANUFACTURERS SPECIFICATIONS.
6. USE FOR 24" BOX TREES.

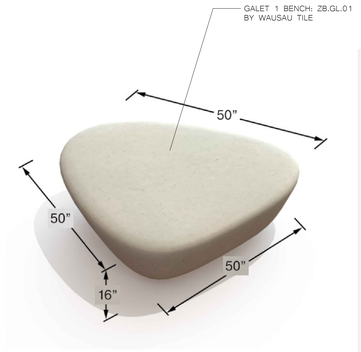


PLAN

SECTION

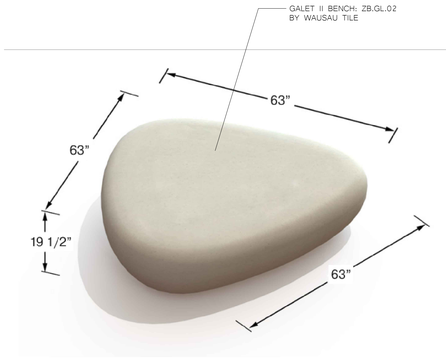
5 STANDARD GRATE STAKING DETAIL

NOTES:
1. REFER TO PLANS FOR ADDITIONAL INFORMATION.
2. SEAT WEIGHT: 2,381 LBS
3. INSTALL PER MANUFACTURERS RECOMMENDATIONS.



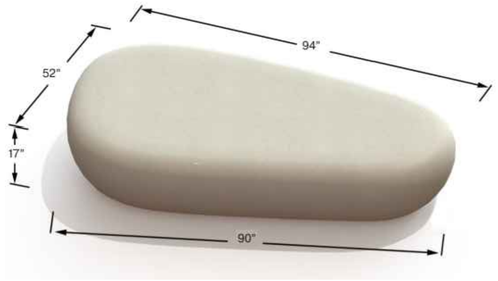
6 PRE-CAST CONCRETE SEAT - ZB.GL.01

NOTES:
1. REFER TO PLANS FOR ADDITIONAL INFORMATION.
2. SEAT WEIGHT: 4,121 LBS
3. INSTALL PER MANUFACTURERS RECOMMENDATIONS.



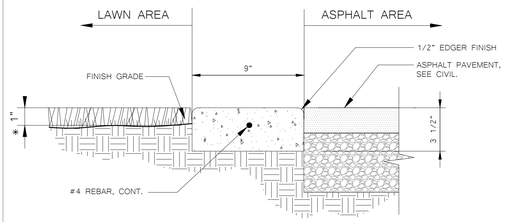
7 PRE-CAST CONCRETE SEAT - ZB.GL.02

NOTES:
1. REFER TO PLANS FOR ADDITIONAL INFORMATION.
2. SEAT WEIGHT: 5,058 LBS
3. INSTALL PER MANUFACTURERS RECOMMENDATIONS.



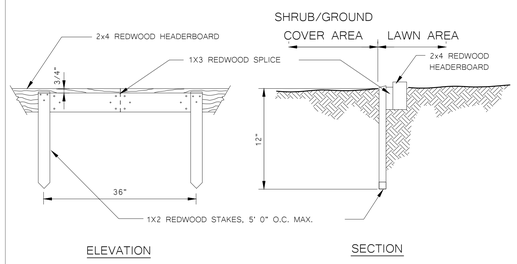
8 PRE-CAST CONCRETE SEAT - ZB.GL.03

NOTES:
1. USE 1/2" FELT EXPANSION JOINT MATERIAL AT ALL CHANGES OF DIRECTIONS AND AT 10' O.C.
*2. WHEN SURFACE DRAINAGE IS INTENDED TO FLOW TOWARD AND ACROSS MOWSTRIP, SOIL SURFACE SHALL BE FLUSH WITH TOP OF MOWSTRIP. UNLESS OTHERWISE NOTED SOIL SHALL BE 1" BELOW TOP OF MOWSTRIP.
3. ALL CONCRETE SHALL BE 5 SACK MIX, 2800 PSI AT 28 DAYS AFTER POUR.
4. FINISH SHALL BE FINE BROOM.



9 9" CONCRETE MOWSTRIP DETAIL

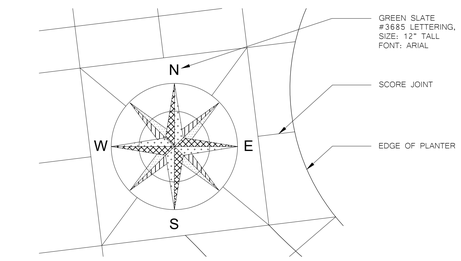
NOTES:
1. WHEREVER POSSIBLE INSTALL STAKES AND SPLICES ON SHRUB/GROUNDCOVER SIDE.
2. ALL LUMBER TO BE REDWOOD CONSTRUCTION ROUGH (CALIFORNIA REDWOOD ASSOCIATION GRADING)
3. LAMINATE 1X4 BOARDS FOR CURVES. USE 1X3 REDWOOD AT SPLICES. STAGGER SPLICES.



ELEVATION SECTION

10 REDWOOD HEADERBOARD DETAIL

NOTES:
1. CONCRETE COLORS: DAVIS COLORS,
LIGHT GRAY #8084
GREEN SLATE #3685
WILLOW GREEN #5376
PALOMINO #5447
FINISH: SALT FINISH
2. CONFIRM COLOR SELECTION WITH OWNER.
3. SEE SHEET L0.3.1 FOR RADIUS AND DIMENSIONS..



DAVIS CONCRETE COLOR KEY

LIGHT GRAY #8084 | WILLOW GREEN #5376
GREEN SLATE #3685 | PALOMINO #5447

11 COMPASS ROSE AND BRONZE LOGO GRAPHICS LAYOUT

AGENCY APPROVAL:

LODI USD

DESIGN FOR GOOD
HMC Architects
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2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

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Δ	DESCRIPTION	DATE

KEYNOTES

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25-31

MTW group
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2707 K Street, Suite 201
Sacramento, CA 95816
916 369-3990

FACILITY:
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2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
LANDSCAPE SITE INSTALLATION DETAILS

DSA SUBMITTAL

DATE: 12/09/2025 | CLIENT PROJ NO:

SHEET:

L0.5.1

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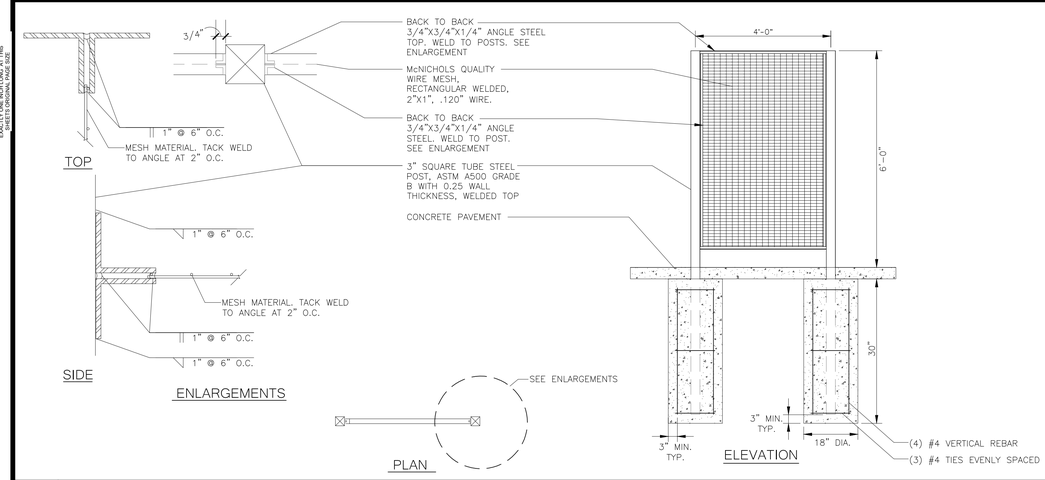
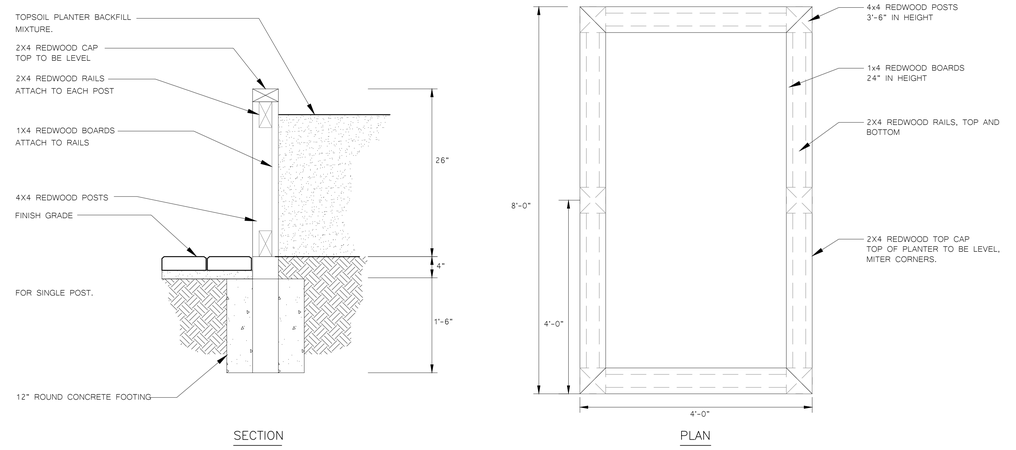
THE LINE BROKEN ABOVE IS EXACTLY 3" LONG ON ORIGINAL SHEETS ORIGINAL PAGE SIZE

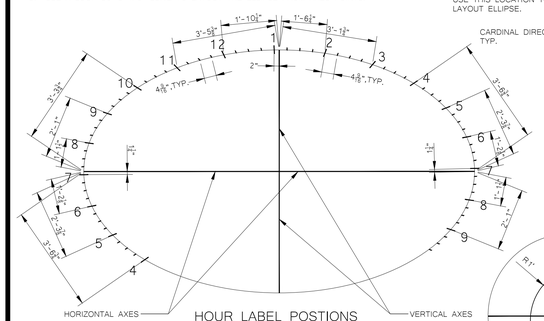


1 TEACHING SCREEN DETAIL

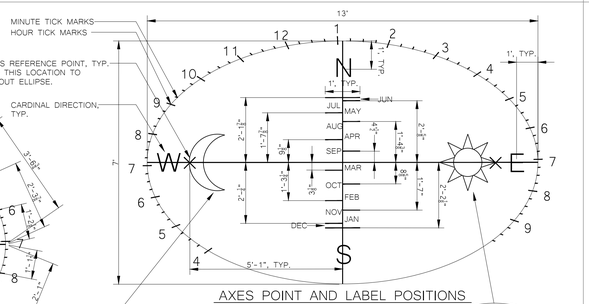


2 GARDEN BOX

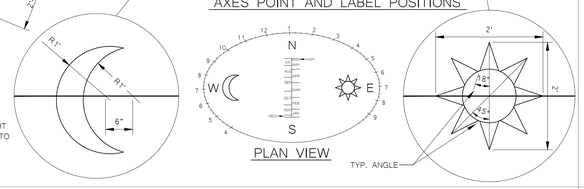
NOTE:
1. SUN DIAL MUST ALIGN TO TRUE NORTH. HORIZONTAL AND VERTICAL AXES ARE REFERENCE LINES FOR DIMENSIONING POINTS, MARKING CARDINAL DIRECTIONS, INDICATING HOURS, AND DESIGNATING MONTHLY POSITIONS, AS WELL AS SUNRISE AND SUNSET POSITIONS. AFTER FINALIZING THE ELLIPSE LAYOUT, REMOVE THESE REFERENCE LINES (REFERENCE PLAN VIEW FOR FINAL LAYOUT)
2. USE A LOOP 23'-2 1/8" LONG TO LAYOUT THE ELLIPSE FROM AXES POINTS.

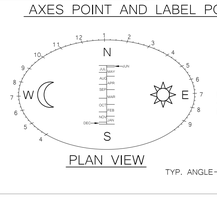


HOUR LABEL POSTIONS



AXES POINT AND LABEL POSITIONS



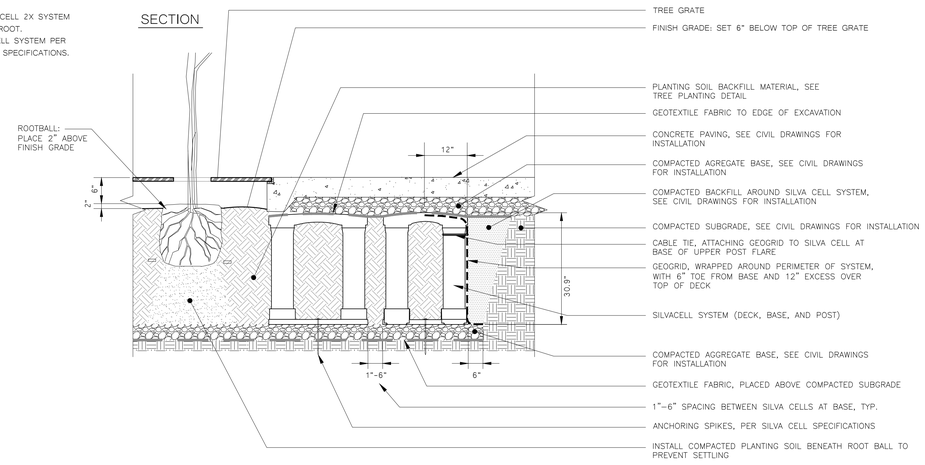


PLAN VIEW

3. ALL LINES ARE TO BE 2" WIDE AND DARK BLUE IN COLOR, UNLESS SPECIFIED OTHERWISE. COLOR TO BE REVIEWED BY OWNER PRIOR TO INSTALLATION. MINUTE TICK MARKS ARE TO BE 4" LONG AND LIGHT BLUE IN COLOR. HOUR TICK MARKS ARE TO BE 8" LONG AND ORANGE IN COLOR. ALL NUMBERING IS TO BE 6" W X 6" H, DARK BLUE IN COLOR. ALL CARDINAL DIRECTION LETTERING IS TO BE 9" W X 9" H, DARK BLUE IN COLOR. ALL MONTH LETTERING IS TO BE 3-¼" X 4-¼" H, LIGHT BLUE IN COLOR.
4. ALL LINES ARE TO BE 2" WIDE AND DARK BLUE IN COLOR, UNLESS SPECIFIED OTHERWISE. COLOR TO BE REVIEWED BY OWNER PRIOR TO INSTALLATION. MINUTE TICK MARKS ARE TO BE 4" LONG AND LIGHT BLUE IN COLOR. HOUR TICK MARKS ARE TO BE 8" LONG AND ORANGE IN COLOR. ALL NUMBERING IS TO BE 6" W X 6" H, DARK BLUE IN COLOR. ALL CARDINAL DIRECTION LETTERING IS TO BE 9" W X 9" H, DARK BLUE IN COLOR. ALL MONTH LETTERING IS TO BE 3-¼" X 4-¼" H, LIGHT BLUE IN COLOR.
5. SUBMIT COLORS, FONT AND SHOP DRAWINGS FOR APPROVAL.

3 SUN DIAL STRIPING DETAIL

NOTE:
1. PRODUCT: SILVA CELL 2X SYSTEM HEIGHT BY DEEPROOT.
2. INSTALL SILVA CELL SYSTEM PER MANUFACTURERS SPECIFICATIONS.



4 SILVA CELL SYSTEM DETAIL

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AGENCY APPROVAL:

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Δ DESCRIPTION DATE

KEYNOTES

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LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
LANDSCAPE SITE INSTALLATION DETAILS

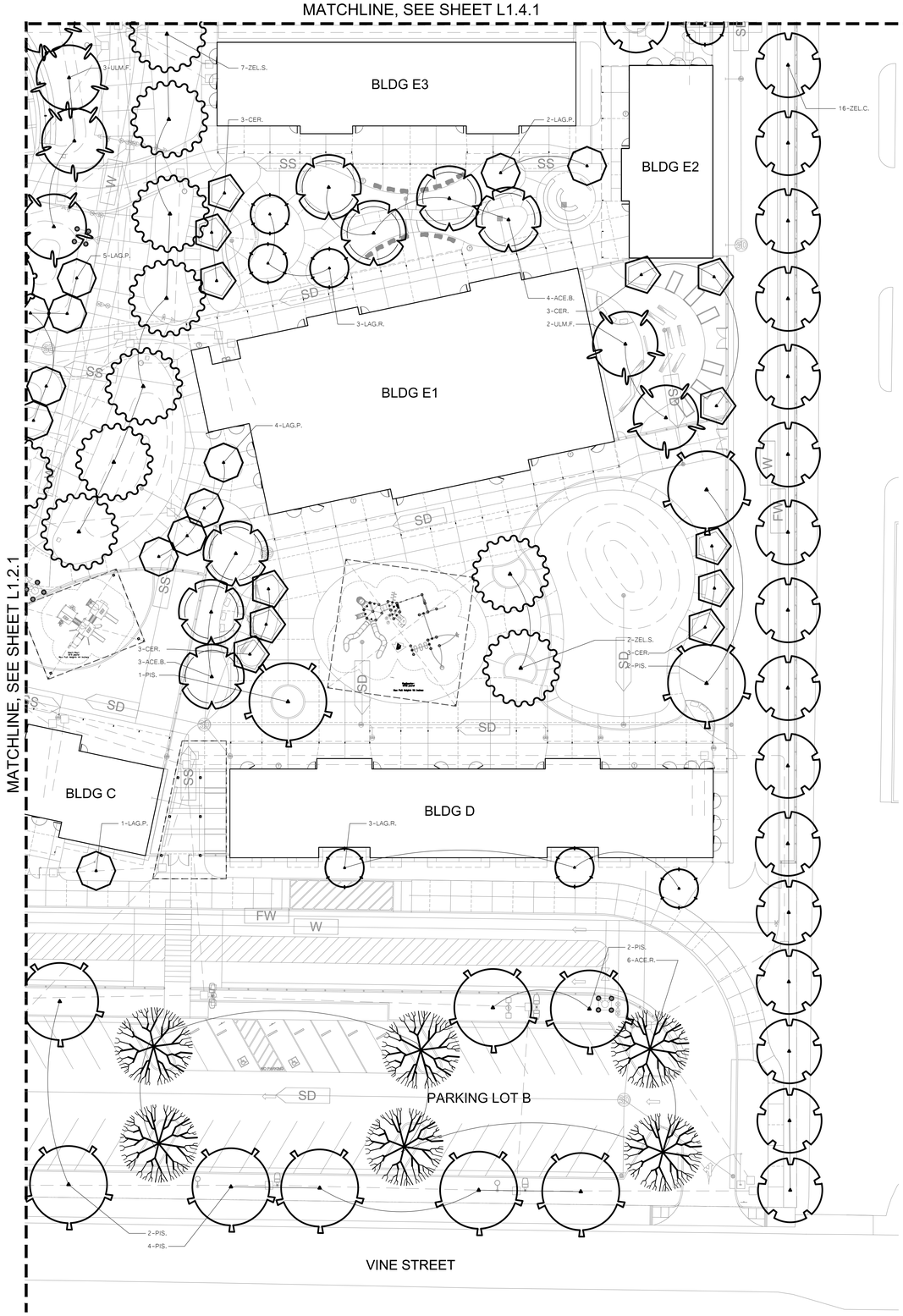
DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

L0.6.1

THE LINE BROWN ABOVE IS EXACTLY 1" WHEN PLOTTED AT 24X36 SHEETS ORIGINAL PAGE SIZE



KEY | TREE LEGEND

TREES - NOT ALL SYMBOLS SHOWN

ROOT BARRIER, INSTALL WHERE SHOWN ON PLANS
SEE DETAIL 2/L4.1.1

7-AAA
PLANT QUANTITY
PLANT KEY

TREE MATERIAL LIST

SIZE	QTY.	KEY	BOTANICAL NAME ... COMMON NAME	WATER USE
			TREES:	
24" BOX	21	ACE.B.	ACER BUERGERIANUM ... TRIDENT MAPLE	MEDIUM
24" BOX	15	ACE.R.	ACER RUBRUM 'RED SUNSET' ... RED MAPLE	MEDIUM
24" BOX	20	CER.	CERCIS CANADENSIS 'OKLAHOMA' ... OKLAHOMA REDBUD	MEDIUM
24" BOX	10	LAG.W.	LAGERSTROEMIA HYBRID 'NATCHEZ' ... WHITE CRAPE MYRTLE	LOW
24" BOX	10	LAG.R.	LAGERSTROEMIA HYBRID 'DYNAMITE' ... RED CRAPE MYRTLE	LOW
24" BOX	15	LAG.P.	LAGERSTROEMIA HYBRID 'TUSCARORA' ... PINK CRAPE MYRTLE	LOW
24" BOX	4	NYS.	NYSSA SYLVATICA ... SOUR GUM	LOW
24" BOX	37	PIS.	PISTACIA CHINENSIS 'KEITH DAVEY' ... CHINESE PISTACHE	LOW
48" BOX	1	QUE.	QUERCUS BUCKLEY ... TEXAS RED OAK	LOW
24" BOX	12	ULM.P.	ULMUS WILSONIANA 'PROSPECTOR' ... PROSPECTOR ELM	LOW
24" BOX	11	ULM.F.	ULMUS 'FRONTIER' ... FRONTIER ELM	LOW
24" BOX	23	ZEL.C.	ZELKOVA 'CITY SPRITE' ... JAPANESE ZELKOVA	MEDIUM
24" BOX	18	ZEL.S.	ZELKOVA SERRATA ... SAWLEAF ZELKOVA	MEDIUM
24" BOX	32	ZEL.M.	ZELKOVA SERRATA 'MUSASHINO' ... MUSASHINO COLUMNAR	MEDIUM

GENERAL LANDSCAPE REQUIREMENTS/NOTES

1. NO PLANTING SHALL BE STARTED UNTIL SPRINKLER IRRIGATION SYSTEM HAS BEEN TESTED BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE AND NOTED DEFICIENCIES CORRECTED.
2. NO PLANTING SHALL BE STARTED UNTIL SOIL PREPARATION AND FINISH GRADING OPERATIONS HAVE BEEN COMPLETED AND APPROVED BY THE OWNER'S REPRESENTATIVE.
3. QUANTITIES SHOWN ON PLANT MATERIAL LIST ARE APPROXIMATE. PROVIDE QUANTITIES INDICATED ON LANDSCAPE PLAN.
4. PLANT MATERIAL IS SUBJECT TO APPROVAL OF OWNER'S REPRESENTATIVE.
5. SEE SHEET L4.1.1 FOR PLANTING INSTALLATION DETAILS.

ENVIRONMENTAL REQUIREMENTS:

GENERAL: PROCEED WITH WORK IN ORDERLY AND TIMELY MANNER TO COMPLETE INSTALLATION OF LANDSCAPING WITHIN CONTRACT LIMITS.

PROTECTION:

EXISTING CONSTRUCTION: EXECUTE WORK IN AN ORDERLY AND CAREFUL MANNER TO PROTECT NEW CONCRETE WALKS, WORK OF OTHER TRADES, AND OTHER IMPROVEMENTS.

EXISTING UTILITIES: DETERMINE LOCATION OF UNDERGROUND UTILITIES AND PERFORM WORK IN A MANNER WHICH WILL AVOID POSSIBLE DAMAGE. HAND EXCAVATE, AS REQUIRED, TO MINIMIZE POSSIBILITY OF DAMAGE TO UNDERGROUND UTILITIES. MAINTAIN GRADE STAKES SET BY OTHERS UNTIL REMOVAL IS MUTUALLY AGREED UPON BY ALL PARTIES CONCERNED. BE RESPONSIBLE FOR PROTECTION OF EXISTING UTILITIES WITHIN CONSTRUCTION AREA; REPAIR DAMAGE TO UTILITIES THAT OCCUR AS A RESULT OF OPERATIONS OF THIS WORK.

LANDSCAPING: PROTECT LANDSCAPE WORK AND MATERIALS FROM DAMAGE DUE TO LANDSCAPE OPERATIONS, OPERATIONS BY OTHER CONTRACTORS AND TRADES AND TRESPASSERS. MAINTAIN PROTECTION DURING INSTALLATION AND MAINTENANCE PERIODS. TREAT, REPAIR OR REPLACE DAMAGED LANDSCAPE WORK AS DIRECTED AT NO ADDITIONAL COST TO CONTRACT.

ADVERSE CONDITIONS: WHEN CONDITIONS DETRIMENTAL TO SOD OR PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, ADVERSE DRAINAGE CONDITIONS, OR OBSTRUCTIONS, NOTIFY OWNER'S REPRESENTATIVE BEFORE STARTING WORK.

PLANTING AND TURF INSTALLATION SEASONS AND CONDITIONS

NO WORK SHALL BE DONE WHEN GROUND IS FROZEN, SNOW COVERED, TOO WET OR IN AN OTHERWISE UNSUITABLE CONDITION FOR AMENDING SOIL, FINISH GRADING OR PLANTING.

SOIL TESTING/SOIL IMPROVEMENT:

SEE SPECIFICATIONS 32 90 00, SECTION 3.02 SOIL TESTING AND SECTION 3.03 PREPARATION.

SOIL PERCOLATION

EXCAVATE 10 PLANTING PITS IN RANDOM AREAS OF SITE. FILL EXCAVATED PLANTING PITS WITH WATER TO 1/2 DEPTH OF PIT. PITS SHOULD DRAIN WITHIN 4 HOURS. IF PLANTING PITS DO NOT DRAIN, NOTIFY INSPECTOR IMMEDIATELY. PLANTING SHALL NOT BE STARTED UNTIL OWNER'S REPRESENTATIVE HAS RESOLVED A METHOD TO REMEDY DRAINAGE ISSUE.

PLANT MATERIAL STANDARDS

PLANTS SHALL BE IN ACCORDANCE WITH AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) ANSI Z60.1- AMERICAN STANDARD FOR NURSERY STOCK, EXCEPT AS OTHERWISE STATED IN SPECIFICATIONS OR SHOWN ON DRAWINGS. WHERE DRAWINGS OR SPECIFICATIONS ARE IN CONFLICT WITH ANSI Z60.1, DRAWINGS AND SPECIFICATIONS SHALL PREVAIL. PRUNE, THIN OUT AND SHAPE TREES IN ACCORDANCE WITH ANSI STANDARD HORTICULTURAL PRACTICE. PRUNE TREES TO RETAIN REQUIRED HEIGHT AND SPREAD. UNLESS OTHERWISE DIRECTED BY LANDSCAPE ARCHITECT, DO NOT CUT TREE LEADERS, AND REMOVE ONLY INJURED OR DEAD BRANCHES FROM FLOWERING TREES.

EXISTING LANDSCAPE AND SPRINKLER IRRIGATION SYSTEM

WORK LIMITS OF THIS PROJECT EXTEND INTO AREAS THAT WERE PREVIOUSLY DEVELOPED UNDER OTHER CONTRACTS. PRIOR TO START OF WORK, CONTRACTOR SHALL MEET WITH OWNER'S REPRESENTATIVE TO LOCATE ALL CONNECTIONS CALLED FOR ON DRAWINGS. WORK LIMITS/FENCING SHALL BE LAID OUT BY CONTRACTOR AND VERIFIED BY OWNER'S REPRESENTATIVE. FENCE TO BE INSTALLED AND IRRIGATION SYSTEM SHALL BE TESTED WITH CONTRACTOR, INSPECTOR, AND OWNER'S REPRESENTATIVE PRESENT. DEFICIENCIES SHALL BE NOTED AT THIS TIME AND ARE THE RESPONSIBILITY OF OWNER. AT COMPLETION OF WORK, SYSTEM WILL AGAIN BE TESTED, DEFICIENCIES NOTED AT THIS TIME THAT WERE NOT NOTED PREVIOUSLY WILL BE RESPONSIBILITY OF CONTRACTOR. EXISTING LANDSCAPE THAT HAS BEEN DAMAGED DUE TO CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION BY CONTRACTOR AT NO ADDITIONAL COST TO OWNER. PRIOR TO MAKING ANY CONNECTION TO MAIN LINE, CONTRACTOR SHALL NOTIFY OWNER 1 WEEK IN ADVANCE SO ADJUSTMENTS TO EXISTING WATERING PROGRAMS CAN BE MADE.

20' 10' 0 20' 40'

SCALE: 1"= 20'-0"

AGENCY APPROVAL:

LODI USD

HMC DESIGN FOR GOOD Architects
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SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

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MTW group
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2707 K Street, Suite 201
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916 369-3990

REGISTERED LANDSCAPE ARCHITECT 5453 CHRISTOPHER M. WOLTS 12/03/25 7/31/27 RENEWAL DATE STATE OF CALIFORNIA

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
TREE PLANTING PLAN

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

L1.1.1

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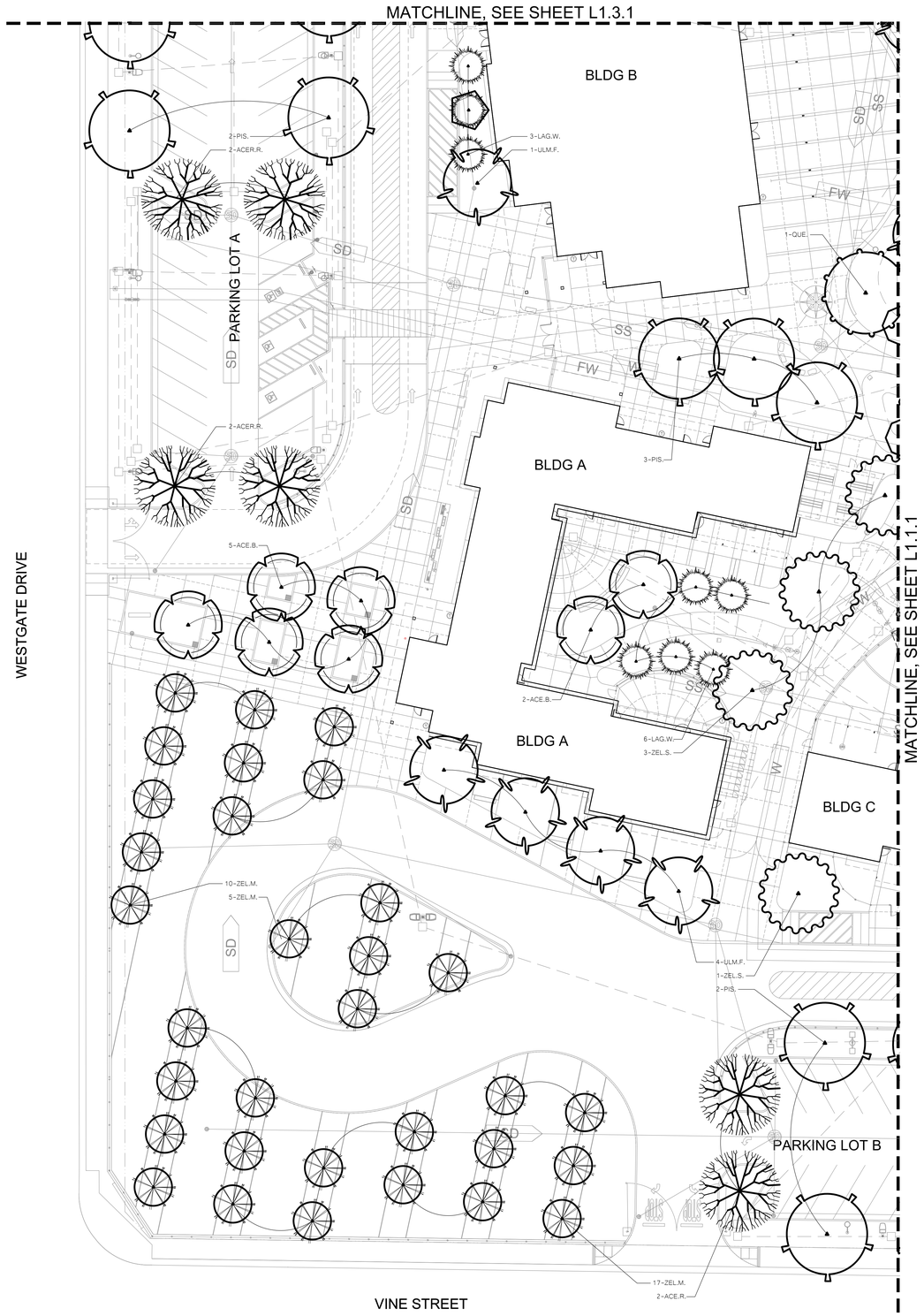

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ROOT BARRIER, INSTALL WHERE SHOWN ON PLANS
SEE DETAIL 2/L4.1.1

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20' 10' 0 20' 40'

SCALE: 1"= 20'-0"

PLEASE RECYCLE

AGENCY APPROVAL:

LODI USD

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KEYNOTES

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2707 K Street, Suite 201
Sacramento, CA 95816
916 369-3990

FACILITY:
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2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
TREE PLANTING PLAN

DSA SUBMITTAL

DATE: **12/09/2025** CLIENT PROJ NO:

SHEET:

L1.2.1

THE LINE BROWN ABOVE IS EXACTLY 1" WHEN PLOTTED ON 24X36 SHEETS ORIGINAL PAGE SIZE

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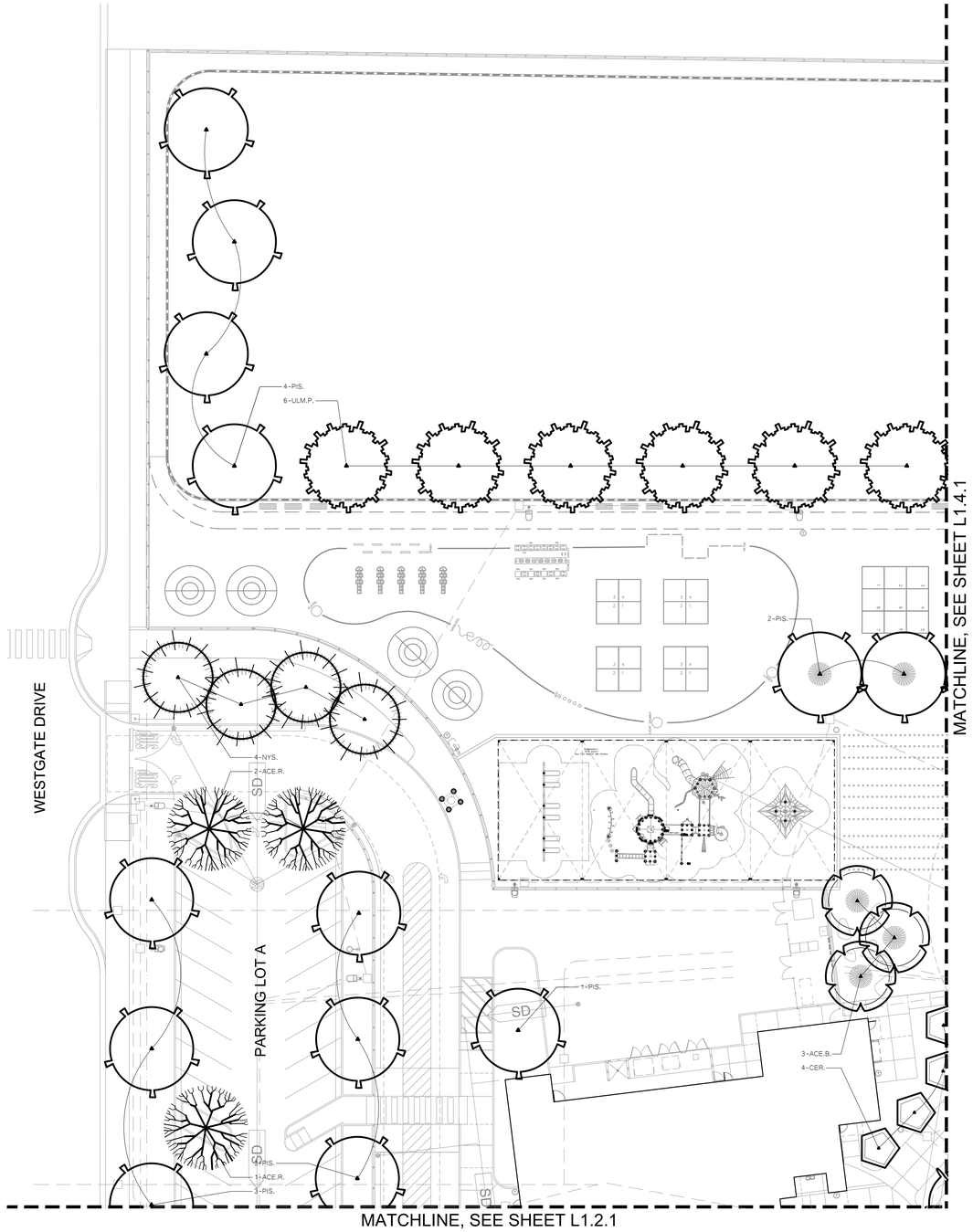

KEY | TREE LEGEND

TREES - NOT ALL SYMBOLS SHOWN

ROOT BARRIER, INSTALL WHERE SHOWN ON PLANS
SEE DETAIL 2/L4.1.1

7-AAA
PLANT QUANTITY
PLANT KEY

TREE MATERIAL LIST

SIZE	QTY.	KEY	BOTANICAL NAME ... COMMON NAME	WATER USE
			TREES:	
24" BOX	21	ACE.B.	ACER BUERGERIANUM ... TRIDENT MAPLE	MEDIUM
24" BOX	15	ACE.R.	ACER RUBRUM 'RED SUNSET' ... RED MAPLE	MEDIUM
24" BOX	20	CER.	CERCIS CANADENSIS 'OKLAHOMA' ... OKLAHOMA REDBUD	MEDIUM
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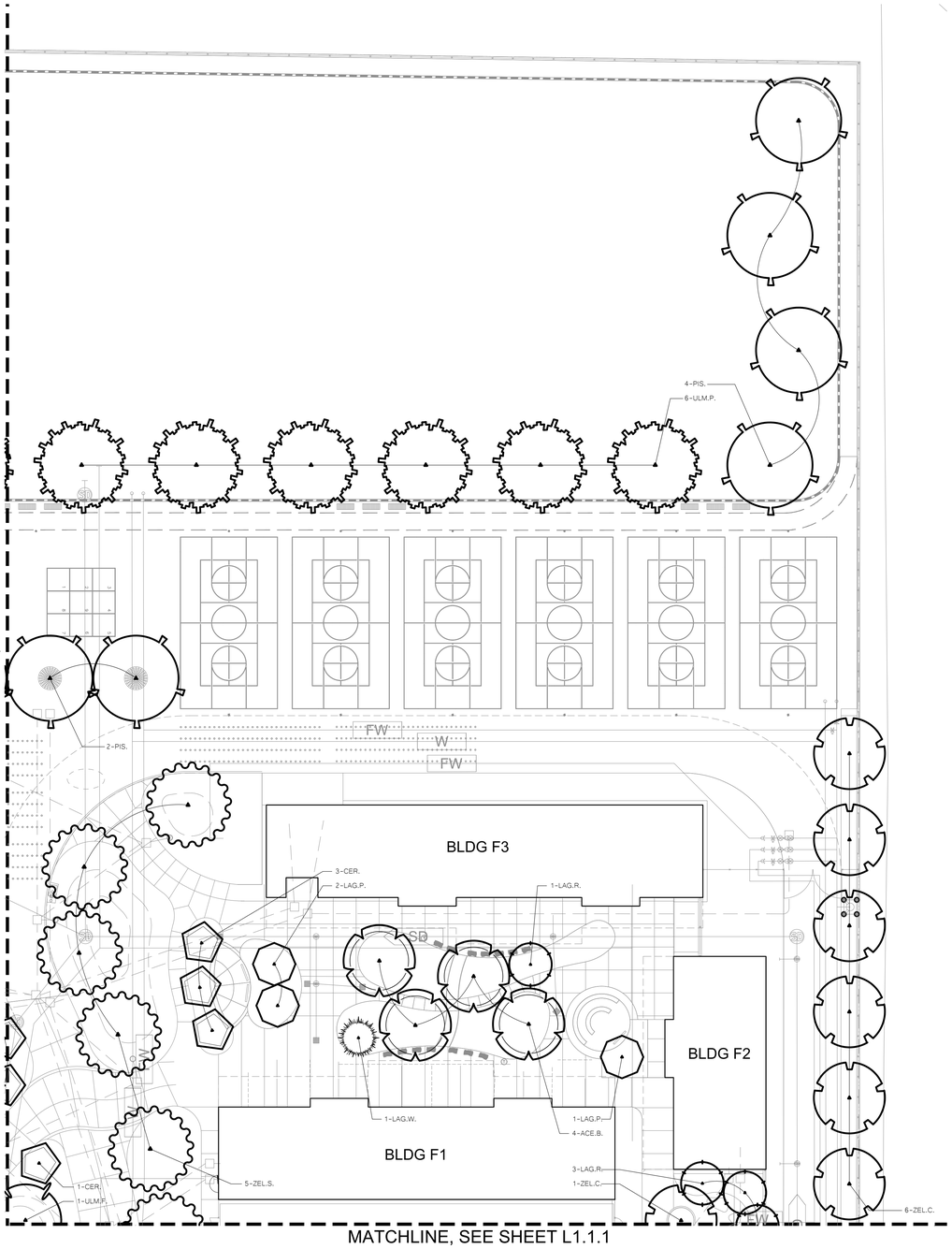

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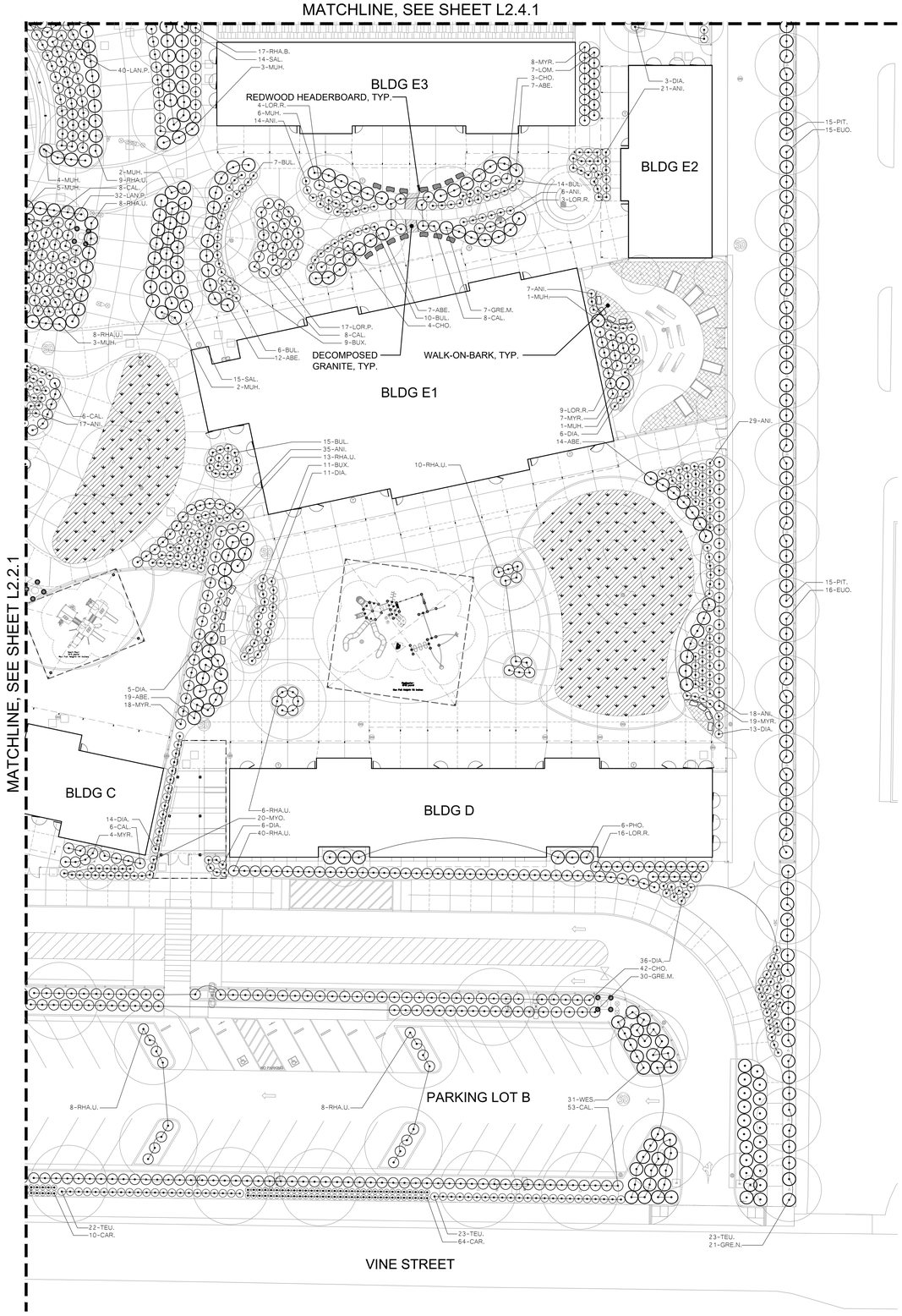

KEY / LANDSCAPE LEGEND

- TREE OUTLINE FOR REFERENCE
- SHRUBS
- PLANT QUANTITY (7 = AAA.)
- PLANT KEY
- LAWN (SOD)
- DECOMPOSED GRANITE — SEE DETAIL 5/L4.1.1
- BARK MULCH ONLY — 3" DEPTH
- WALK ON BARK — READYPLAY EWF BY MYBARK, OR APPROVED EQUAL.
- CONCRETE MOWSTRIP — SEE DETAIL 9/L0.5.1
- REDWOOD HEADERBOARD — SEE DETAIL 10/L0.5.1

PLANT MATERIAL LIST

WATER USE	SIZE	QUANTITY	KEY	BOTANICAL NAME ... COMMON NAME
				SHRUBS:
LOW	5 G.C.	86	ABE.	ABELIA GRANDIFLORA 'KALEIDOSCOPE' ... KALEIDSCOPE ABELIA
LOW	5 G.C.	233	ANI.	ANIGOZANTHOS FLAVIDUS ... KANGAROO PAW
LOW	5 G.C.	124	BUL.	BULBINE FRUTESCENS 'HALLMARK' ... HALLMARK BULBINE
LOW	5 G.C.	37	BUX.	BUXUS MICROPHYLLA VAR. JAPONICA 'GREEN BEAUTY' ... GREEN BEAUTY JAPANESE BOXWOOD
LOW	5 G.C.	253	CAL.	CALLISTEMON VIMINALIS 'LITTLE JOHN' ... DWARF BOTTLE BRUSH
LOW	5 G.C.	266	CAR.	CAREX DIVULSA ... EUROPEAN GREY SEDGE
LOW	5 G.C.	131	CHO.	CHONDROPETALUM TECTORUM ... CAPE RUSH
LOW	5 G.C.	212	DIA.	DIANELLA TASMANICA 'VARIEGATA' ... VARIEGATED TASMAN FLAX LILY
LOW	15 G.C.	41	EUO.	EUONYMUS JAPONICUS 'AUREOVARIEGATUS' ... GOLD SPOT EUONYMUS
LOW	5 G.C.	110	GRE.M.	GREVILLEA LANIGERA 'MT. TAMBORITHA' ... MT TAMBORITHA WOOLLY GREVILLEA
LOW	5 G.C.	46	GRE.N.	GREVILLEA 'NOELLII' ... GREVILLEA
LOW	5 G.C.	87	LAN.N.	LANTANA 'NEW GOLD' ... NEW GOLD LANTANA
LOW	5 G.C.	263	LAN.P.	LANTANA MONTEVIDENSIS (PURPLE) ... PURPLE TRAILING LANTANA
LOW	5 G.C.	226	LOM.	LOMANDRA LONGIFOLIA 'BREEZE' ... BREEZE DWARF MAT RUSH
MEDIUM	5 G.C.	67	LOR.P.	LOROPETALUM CHINENSE 'PURPLE DAYDREAM' ... DWARF LOROPETALUM
MEDIUM	5 G.C.	90	LOR.R.	LOROPETALUM CHINENSE 'RAZZLEBERRY' ... FRINGE FLOWER
LOW	5 G.C.	87	MUH.	MUHLENBERGIA RIGENS ... DEER GRASS
LOW	5 G.C.	151	MYR.	MRYSINE AFRICANA ... AFRICAN BOXWOOD
LOW	5 G.C.	13	PHO.	PHORMIUM TENAX 'RUBRUM' ... NEW ZEALAND FLAX
LOW	5 G.C.	41	PIT.	PITTOSPORUM TOBIRA 'SHIMA' ... CREAM DE MINT DWARF PITTOSPORUM
LOW	5 G.C.	5	PRU.	PRUNUS CAROLINIANA 'BRIGHT 'N TIGHT' ... CAROLINA LAUREL CHERRY
LOW	5 G.C.	35	RHA.B.	RHAPHIOLEPIS INDICA 'BALLERINA' ... BALLERINA INDIAN HAWTHORN
LOW	5 G.C.	188	RHA.U.	RHAPHIOLEPIS UMBELLATA 'MINOR' ... YEDDA HAWTHORN
LOW	5 G.C.	68	SAL.	SALVIA LEUCANTHA ... MEXICAN BUSH SAGE
LOW	5 G.C.	179	TEU.	TEUCRIUM CHAMAEDRYS ... WALL GERMANDER
				GROUNDCOVER:
LOW	5 G.C.	193	MYO.	MYOPORUM PARVIFOLIUM ... MYOPORUM
LOW	5 G.C.	92	WES.	WESTRINGIA FRUTICOSA 'MUNDI' ... MUNDI COAST ROSEMARY

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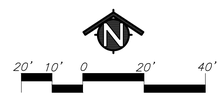

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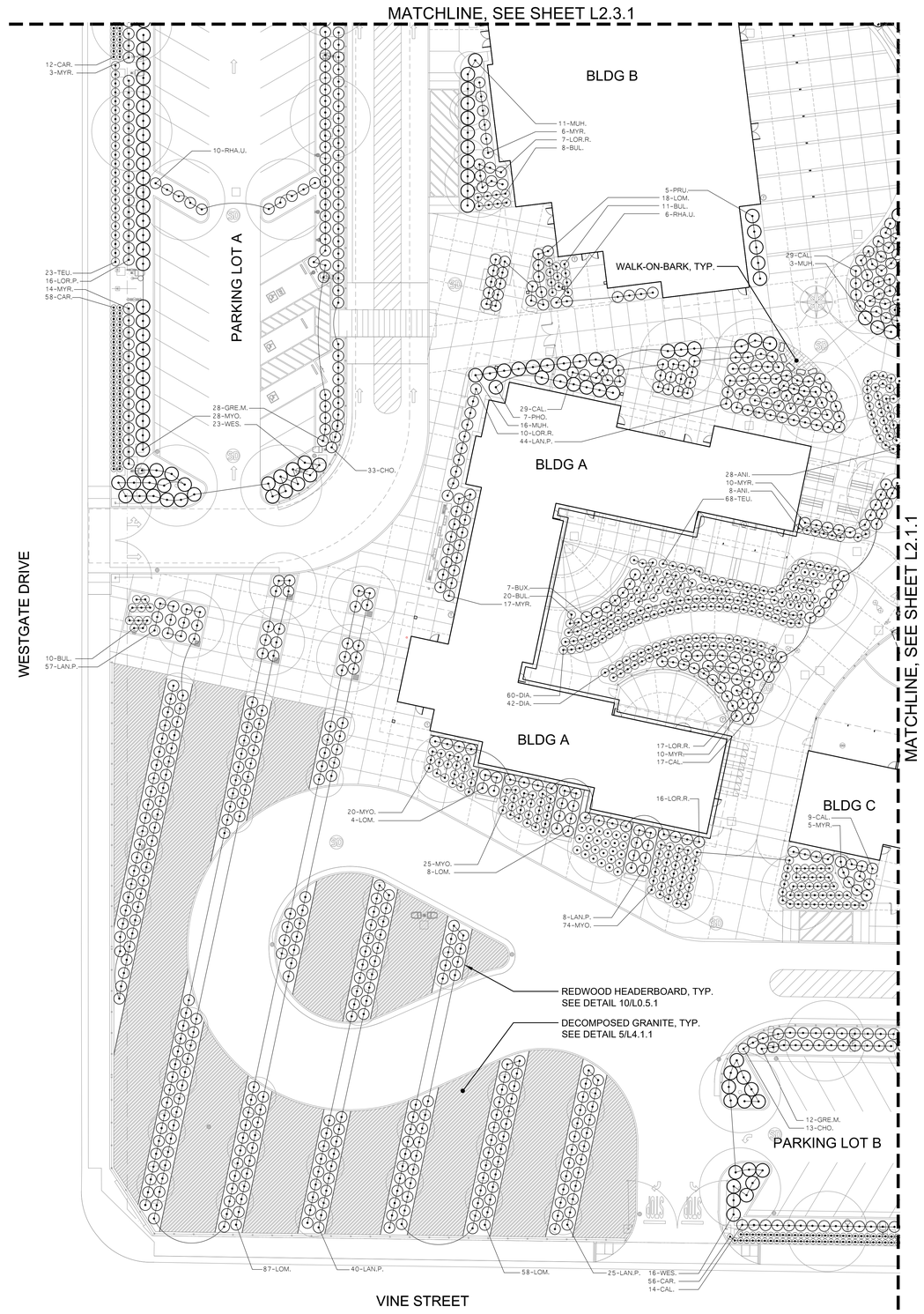

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LANDSCAPE LEGEND

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7 = AAA — PLANT QUANTITY / PLANT KEY

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DECOMPOSED GRANITE
SEE DETAIL 5/L4.1.1

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20' 10' 0 20' 40'

SCALE: 1"= 20'-0"

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LICENSED LANDSCAPE ARCHITECT 5453 CHRISTOPHER M. HOLLIS MTW GROUP STATE OF CALIFORNIA 12/03/25 7/31/27

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THE LINE BROWN ABOVE IS EXACTLY ONE INCH LONG ON 24X36 SHEETS ORIGINAL PAGE SIZE

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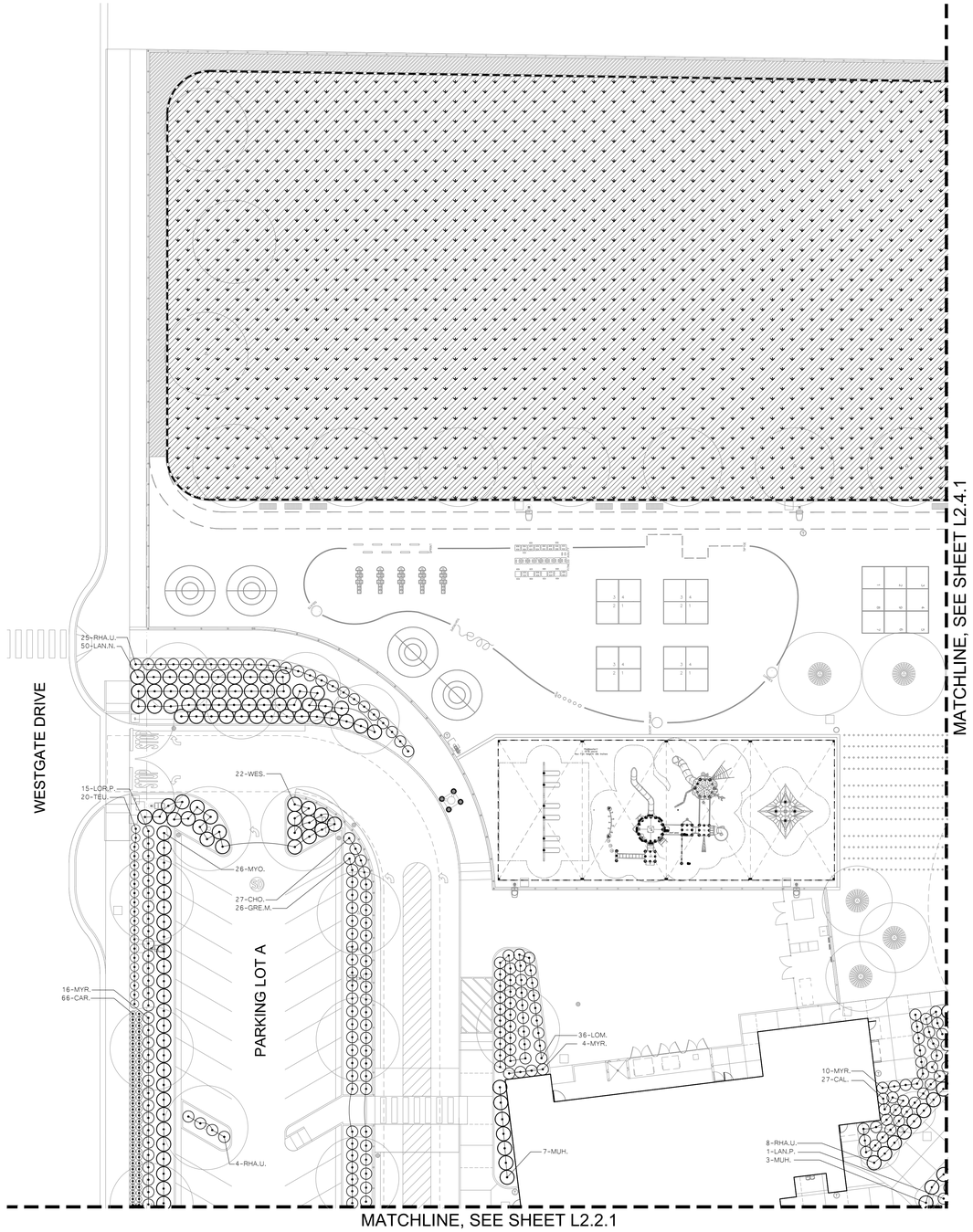

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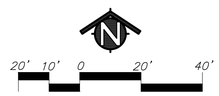

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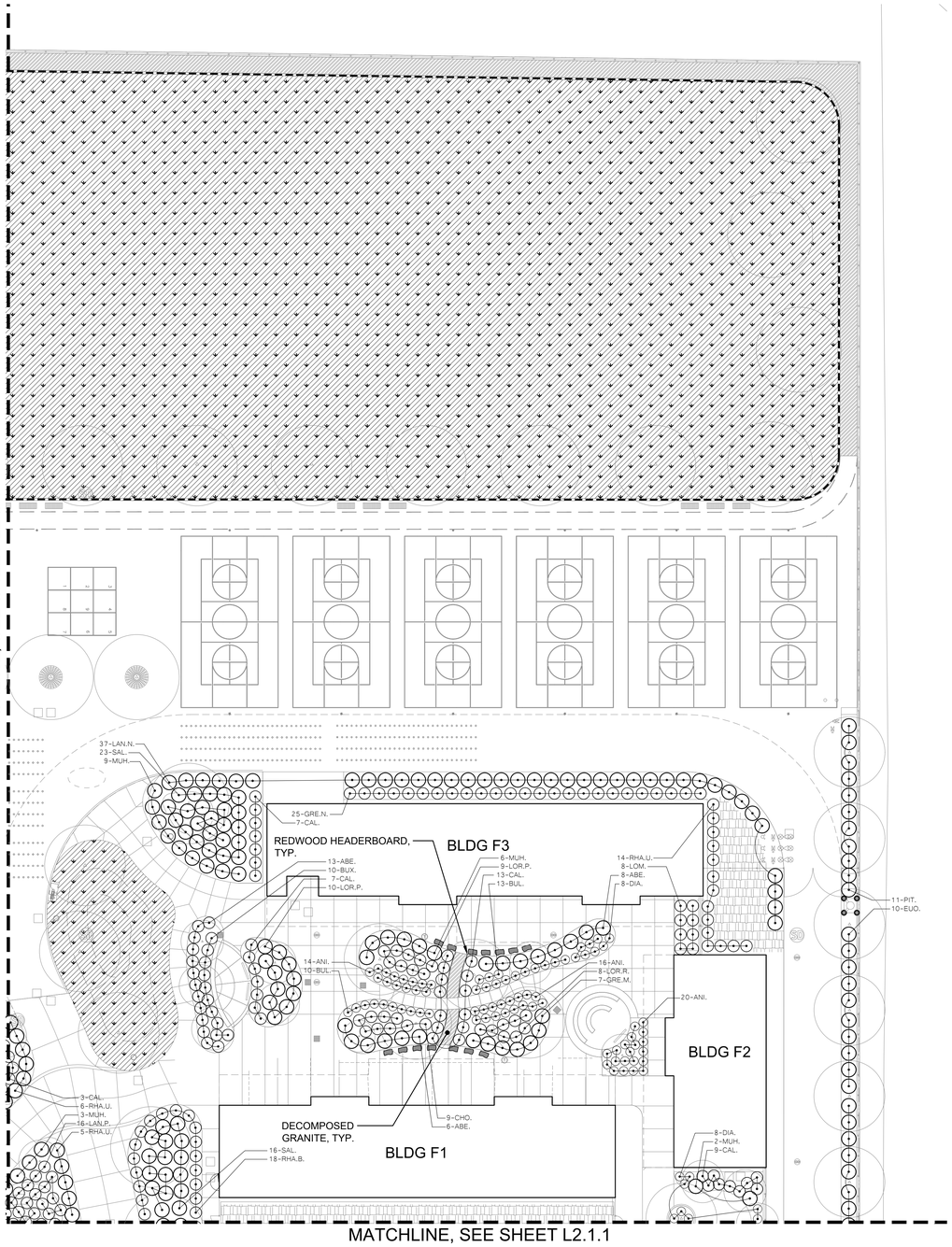

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- DECOMPOSED GRANITE — SEE DETAIL 5/L4.1.1
- BARK MULCH ONLY — 3" DEPTH
- WALK ON BARK — READYPLAY EWF BY MYBARK, OR APPROVED EQUAL.
- CONCRETE MOWSTRIP — SEE DETAIL 9/L0.5.1
- REDWOOD HEADERBOARD — SEE DETAIL 10/L0.5.1

PLANT MATERIAL LIST

WATER USE	SIZE	QUANTITY	KEY	BOTANICAL NAME ... COMMON NAME
				SHRUBS:
LOW	5 G.C.	86	ABE.	ABELIA GRANDIFLORA 'KALEIDOSCOPE' ... KALEIDSCOPE ABELIA
LOW	5 G.C.	233	ANI.	ANIGOZANTHOS FLAVIDUS ... KANGAROO PAW
LOW	5 G.C.	124	BUL.	BULBINE FRUTESCENS 'HALLMARK' ... HALLMARK BULBINE
LOW	5 G.C.	37	BUX.	BUXUS MICROPHYLLA VAR. JAPONICA 'GREEN BEAUTY' ... GREEN BEAUTY JAPANESE BOXWOOD
LOW	5 G.C.	253	CAL.	CALLISTEMON VIMINALIS 'LITTLE JOHN' ... DWARF BOTTLE BRUSH
LOW	5 G.C.	266	CAR.	CAREX DIVULSA ... EUROPEAN GREY SEDGE
LOW	5 G.C.	131	CHO.	CHONDROPETALUM TECTORUM ... CAPE RUSH
LOW	5 G.C.	212	DIA.	DIANELLA TASMANICA 'VARIEGATA' ... VARIEGATED TASMAN FLAX LILY
LOW	15 G.C.	41	EUO.	EUONYMUS JAPONICUS 'AUREOVARIEGATUS' ... GOLD SPOT EUONYMUS
LOW	5 G.C.	110	GRE.M.	GREVILLEA LANIGERA 'MT. TAMBORITHA' ... MT TAMBORITHA WOOLLY GREVILLEA
LOW	5 G.C.	46	GRE.N.	GREVILLEA 'NOELLII' ... GREVILLEA
LOW	5 G.C.	87	LAN.N.	LANTANA 'NEW GOLD' ... NEW GOLD LANTANA
LOW	5 G.C.	263	LAN.P.	LANTANA MONTEVIDENSIS (PURPLE) ... PURPLE TRAILING LANTANA
LOW	5 G.C.	226	LOM.	LOMANDRA LONGIFOLIA 'BREEZE' ... BREEZE DWARF MAT RUSH
MEDIUM	5 G.C.	67	LOR.P.	LOROPETALUM CHINENSE 'PURPLE DAYDREAM' ... DWARF LOROPETALUM
MEDIUM	5 G.C.	90	LOR.R.	LOROPETALUM CHINENSE 'RAZZLEBERRY' ... FRINGE FLOWER
LOW	5 G.C.	87	MUH.	MUHLENBERGIA RIGENS ... DEER GRASS
LOW	5 G.C.	151	MYR.	MRYSINE AFRICANA ... AFRICAN BOXWOOD
LOW	5 G.C.	13	PHO.	PHORMIUM TENAX 'RUBRUM' ... NEW ZEALAND FLAX
LOW	5 G.C.	41	PIT.	PITTOSPORUM TOBIRA 'SHIMA' ... CREAM DE MINT DWARF PITTOSPORUM
LOW	5 G.C.	5	PRU.	PRUNUS 'CAROLINIANA 'BRIGHT 'N TIGHT' ... CAROLINA LAUREL CHERRY
LOW	5 G.C.	35	RHA.B.	RHAPHIOLEPIS INDICA 'BALLERINA' ... BALLERINA INDIAN HAWTHORN
LOW	5 G.C.	188	RHA.U.	RHAPHIOLEPIS UMBELLATA 'MINOR' ... YEDDA HAWTHORN
LOW	5 G.C.	68	SAL.	SALVIA LEUCANTHA ... MEXICAN BUSH SAGE
LOW	5 G.C.	179	TEU.	TEUCRIUM CHAMAEDRYS ... WALL GERMANDER
				GROUNDCOVER:
LOW	5 G.C.	193	MYO.	MYOPORUM PARVIFOLIUM ... MYOPORUM
LOW	5 G.C.	92	WES.	WESTRINGIA FRUTICOSA 'MUNDI' ... MUNDI COAST ROSEMARY

GENERAL LANDSCAPE REQUIREMENTS/NOTES

1. NO PLANTING SHALL BE STARTED UNTIL SPRINKLER IRRIGATION SYSTEM HAS BEEN TESTED BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE AND NOTED DEFICIENCIES CORRECTED.
2. NO PLANTING SHALL BE STARTED UNTIL SOIL PREPARATION AND FINISH GRADING OPERATIONS HAVE BEEN COMPLETED AND APPROVED BY THE OWNER'S REPRESENTATIVE.
3. QUANTITIES SHOWN ON PLANT MATERIAL LIST ARE APPROXIMATE. PROVIDE QUANTITIES INDICATED ON LANDSCAPE PLAN.
4. PLANT MATERIAL IS SUBJECT TO APPROVAL OF OWNER'S REPRESENTATIVE.
5. SEE SHEET L4.1.1 FOR PLANTING INSTALLATION DETAILS.

ENVIRONMENTAL REQUIREMENTS:

GENERAL: PROCEED WITH WORK IN ORDERLY AND TIMELY MANNER TO COMPLETE INSTALLATION OF LANDSCAPING WITHIN CONTRACT LIMITS.

PROTECTION:

EXISTING CONSTRUCTION: EXECUTE WORK IN AN ORDERLY AND CAREFUL MANNER TO PROTECT NEW CONCRETE WALKS, WORK OF OTHER TRADES, AND OTHER IMPROVEMENTS.

EXISTING UTILITIES: DETERMINE LOCATION OF UNDERGROUND UTILITIES AND PERFORM WORK IN A MANNER WHICH WILL AVOID POSSIBLE DAMAGE. HAND EXCAVATE, AS REQUIRED, TO MINIMIZE POSSIBILITY OF DAMAGE TO UNDERGROUND UTILITIES. MAINTAIN GRADE STAKES SET BY OTHERS UNTIL REMOVAL IS MUTUALLY AGREED UPON BY ALL PARTIES CONCERNED. BE RESPONSIBLE FOR PROTECTION OF EXISTING UTILITIES WITHIN CONSTRUCTION AREA; REPAIR DAMAGE TO UTILITIES THAT OCCUR AS A RESULT OF OPERATIONS OF THIS WORK.

LANDSCAPING: PROTECT LANDSCAPE WORK AND MATERIALS FROM DAMAGE DUE TO LANDSCAPE OPERATIONS, OPERATIONS BY OTHER CONTRACTORS AND TRADES AND TRESPASSERS. MAINTAIN PROTECTION DURING INSTALLATION AND MAINTENANCE PERIODS. TREAT, REPAIR OR REPLACE DAMAGED LANDSCAPE WORK AS DIRECTED AT NO ADDITIONAL COST TO CONTRACT.

ADVERSE CONDITIONS: WHEN CONDITIONS DETRIMENTAL TO SOD OR PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, ADVERSE DRAINAGE CONDITIONS, OR OBSTRUCTIONS, NOTIFY OWNER'S REPRESENTATIVE BEFORE STARTING WORK.

PLANTING AND TURF INSTALLATION SEASONS AND CONDITIONS

NO WORK SHALL BE DONE WHEN GROUND IS FROZEN, SNOW COVERED, TOO WET OR IN AN OTHERWISE UNSUITABLE CONDITION FOR AMENDING SOIL, FINISH GRADING OR PLANTING.

SOIL TESTING/SOIL IMPROVEMENT:

SEE SPECIFICATIONS 32 90 00, SECTION 3.02 SOIL TESTING AND SECTION 3.03 PREPARATION.

SOIL PERCOLATION

EXCAVATE 10 PLANTING PITS IN RANDOM AREAS OF SITE. FILL EXCAVATED PLANTING PITS WITH WATER TO 1/2 DEPTH OF PIT. PITS SHOULD DRAIN WITHIN 4 HOURS. IF PLANTING PITS DO NOT DRAIN, NOTIFY INSPECTOR IMMEDIATELY. PLANTING SHALL NOT BE STARTED UNTIL OWNER'S REPRESENTATIVE HAS RESOLVED A METHOD TO REMEDY DRAINAGE ISSUE.

PLANT MATERIAL STANDARDS

PLANTS SHALL BE IN ACCORDANCE WITH AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) ANSI Z60.1- AMERICAN STANDARD FOR NURSERY STOCK, EXCEPT AS OTHERWISE STATED IN SPECIFICATIONS OR SHOWN ON DRAWINGS. WHERE DRAWINGS OR SPECIFICATIONS ARE IN CONFLICT WITH ANSI Z60.1, DRAWINGS AND SPECIFICATIONS SHALL PREVAIL. PRUNE, THIN OUT AND SHAPE TREES IN ACCORDANCE WITH ANSI STANDARD HORTICULTURAL PRACTICE. PRUNE TREES TO RETAIN REQUIRED HEIGHT AND SPREAD. UNLESS OTHERWISE DIRECTED BY LANDSCAPE ARCHITECT, DO NOT CUT TREE LEADERS, AND REMOVE ONLY INJURED OR DEAD BRANCHES FROM FLOWERING TREES.

EXISTING LANDSCAPE AND SPRINKLER IRRIGATION SYSTEM

WORK LIMITS OF THIS PROJECT EXTEND INTO AREAS THAT WERE PREVIOUSLY DEVELOPED UNDER OTHER CONTRACTS. PRIOR TO START OF WORK, CONTRACTOR SHALL MEET WITH OWNER'S REPRESENTATIVE TO LOCATE ALL CONNECTIONS CALLED FOR ON DRAWINGS. WORK LIMITS/FENCING SHALL BE LAID OUT BY CONTRACTOR AND VERIFIED BY OWNER'S REPRESENTATIVE. FENCE TO BE INSTALLED AND IRRIGATION SYSTEM SHALL BE TESTED WITH CONTRACTOR, INSPECTOR, AND OWNER'S REPRESENTATIVE PRESENT. DEFICIENCIES SHALL BE NOTED AT THIS TIME AND ARE THE RESPONSIBILITY OF OWNER. AT COMPLETION OF WORK, SYSTEM WILL AGAIN BE TESTED, DEFICIENCIES NOTED AT THIS TIME THAT WERE NOT NOTED PREVIOUSLY WILL BE RESPONSIBILITY OF CONTRACTOR. EXISTING LANDSCAPE THAT HAS BEEN DAMAGED DUE TO CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION BY CONTRACTOR AT NO ADDITIONAL COST TO OWNER. PRIOR TO MAKING ANY CONNECTION TO MAIN LINE, CONTRACTOR SHALL NOTIFY OWNER 1 WEEK IN ADVANCE SO ADJUSTMENTS TO EXISTING WATERING PROGRAMS CAN BE MADE.

20' 10' 0 20' 40'

SCALE: 1"= 20'-0"

AGENCY APPROVAL:

LODI USD

HMC DESIGN FOR GOOD Architects
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

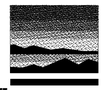
ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

NOTES

25-31



MTW group
LANDSCAPE ARCHITECTURE AND PLANNING
2707 K Street, Suite 201
Sacramento, CA 95816
916 369-3990

REGISTERED LANDSCAPE ARCHITECT — 5453 — 12/03/25 — 7/31/27 — STATE OF CALIFORNIA

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
SHRUB PLANTING PLAN

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

L2.4.1

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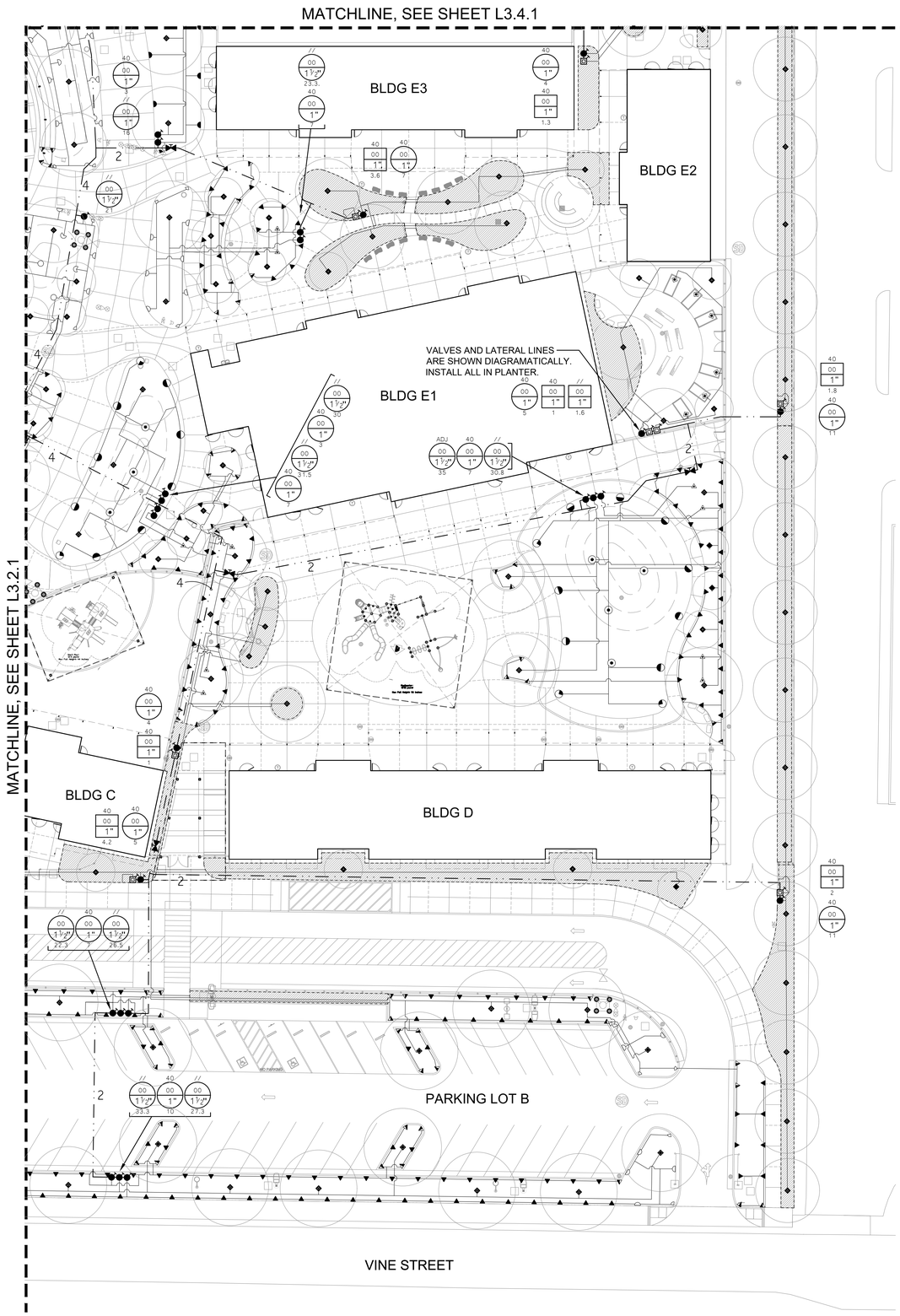
THE LINE BROKEN ABOVE IS EXACTLY 1" WHEN PLOTTED AT 24 X 36 SHEETS ORIGINAL PAGE SIZE



KEY / SPRINKLER IRRIGATION LEGEND

AUTOMATIC CONTROLLER 'A':
RAINBIRD ESP-LXME - 48 STATIONS
MODEL#: ICAB-RB3-48/SP/V2-ETH/RSDE/IFS-400C/3200-400
CONTACT KIM GOLDENSTEIN AT IMPERIAL TECH SERVICES: 619-380-1833, kimgoldenstein1@gmail.com
CONTROLLER TO BE ASSEMBLED IN STAINLESS STEEL TOP ENTRY STRONGBOX ENCLOUSRE WITH ETHERNET MODEM, AND SURGE PROTECTION.

COORDINATE 110 SERVICE AND POWER CONNECTION WITH ELECTRICAL SUB-CONTRACTOR.
COORDINATE ETHERNET CONNECTION WITH THE ELECTRICAL SUB-CONTRACTOR.

AUTOMATIC CONTROLLER 'B':
RAINBIRD ESP-LXME - 36 STATIONS
MODEL#: ICAB-RB-R3-36/SP/V2-ETH/RSDE/IFS-400C/3200-400
CONTACT KIM GOLDENSTEIN AT IMPERIAL TECH SERVICES: 619-380-1833, kimgoldenstein1@gmail.com
CONTROLLER TO BE ASSEMBLED IN STAINLESS STEEL TOP ENTRY STRONGBOX ENCLOUSRE WITH ETHERNET MODEM, AND SURGE PROTECTION.

COORDINATE 110 SERVICE AND POWER CONNECTION WITH ELECTRICAL SUB-CONTRACTOR.
COORDINATE ETHERNET CONNECTION WITH THE ELECTRICAL SUB-CONTRACTOR.

GROUNDING ROD ASSEMBLY:
SEE DETAIL 2/L4.2.1

POINT OF CONNECTION:
STATIC WATER PRESSURE PRIOR TO WATER METER: 44 PSI
DYNAMIC WATER PRESSURE AFTER IRRIGATION BACKFLOW DEVICE: 30 PSI
IRRIGATION SYSTEM OPERATING WATER PRESSURE: 40 PSI
MAXIMUM FLOW IS 90 GPM

CONTRACTOR SHALL LOCATE BACKFLOW PREVENTION DEVICE INDICATED ON CIVIL SHEETS.
CONNECT AT THIS POINT AND EXTEND AS INDICATED ON DRAWINGS.

BOOSTER PUMP:
BOOSTER PUMP SHALL BE BY V-POWER EQUIPMENT, INC.
MODEL#: 19GMTW/1119ZQ25-1-10VFD-460-3
CONTACT CHRIS MURRAY AT 916-265-6743.

INLET PRESSURE: 27 PSI
OUTLET PRESSURE: 76 PSI
MIN/MAX WATER DEMAND: 30GPM/190GPM
POWER INPUT: 480V, 3 PHASE

MASTER VALVE/FLOW SENSOR ASSEMBLY:
MASTER VALVE = 3" NORMALLY OPEN GRISWOLD #2160N
FLOW SENSOR = CST FSI-S30-001 WITH 3" SADDLE
FLOW SENSOR TO BE CONNECTED TO AUTOMATIC CONTROLLER WITH UF-14 WIRE.
MASTER VALVE TO BE CONNECTED TO AUTOMATIC CONTROLLER WITH UF-14 WIRE.

GATE VALVE:
TYPE:
4" SIZE: LEEMCO LMV-XXBB BELL WITH A NON-RISING STEM AND OPERATING NUT.
3" SIZE AND SMALLER: LEEMCO LGT-XXSS THREADED WITH A NON-RISING STEM AND HANDWHEEL.

GATE VALVE INSTALLED IN A VALVE BOX WITH TOP OF BOX SET FLUSH TO FINISH GRADE.
GATE VALVE TO BE LINE SIZE.

PRESSURE MAIN LINE:
TYPE:
4" SIZE : ASTM D2241 SDR 21, 200 PSI, RUBBER GASKETED WITH LEEMCO FITTINGS
2" SIZE AND SMALLER: ASTM D1785, PVC SCHEDULE 40 WITH LEEMCO FITTINGS.

TRENCH DEPTH:
IN PLANTED AREAS: 24" MINIMUM COVER.
UNDER PAVED AREAS: 24" MINIMUM COVER.
PVC SCHEDULE 40 SLEEVES ARE REQUIRED FOR ALL PIPING UNDER PAVEMENT.

LATERAL LINE:
TYPE:
ASTM D1785, PVC SCHEDULE 40, SOLVENT WELD ALL UNSIZED PIPE SHALL BE 3/4" SIZE.
TRENCH DEPTH:
IN PLANTED AREAS:
POP-UP SPRAY HEADS - 12" MINIMUM COVER.
ROTOR HEADS: - 18" MINIMUM COVER.
BUBBLER HEADS: - 12" MINIMUM COVER.
UNDER PAVED AREAS: 24" MINIMUM COVER.
PVC SCHEDULE 40 SLEEVES ARE REQUIRED FOR ALL PIPING UNDER PAVEMENT.

AUTOMATIC CONTROL VALVE:
RAINBIRD PEB-PRS-D SERIES, OR APPROVED EQUAL.
PRESSURE REGULATOR AS INDICATED ON VALVE ID.

QUICK COUPLER VALVE:
RAINBIRD 44NP, OR APPROVED EQUAL.
VALVES SHALL HAVE LOCKING RUBBER COVERS, INSTALLED IN VALVE BOXES. TOP OF VALVE BOX SHALL HAVE BOLT DOWN LID AND TOP SET LEVEL TO FINISH GRADE.

LAWN POP-UP ROTOR HEADS:
10.0.73 — FULL CIRCLE
RAINBIRD: 6504-PC-SS-8 (GREEN NOZZLE)
GPM:IN/HR (60 PSI)
10.0.73 — THREE QUARTER CIRCLE
RAINBIRD: 6504-PC-SS-8 (GREEN NOZZLE)
GPM:IN/HR (60 PSI)
10.0.73 — HALF CIRCLE
RAINBIRD: 6504-PC-SS-8 (GREEN NOZZLE)
GPM:IN/HR (60 PSI)
10.0.73 — QUARTER CIRCLE
RAINBIRD: 6504-PC-SS-8 (GREEN NOZZLE)
GPM:IN/HR (60 PSI)

LAWN POP-UP INTERMEDIATE ROTOR HEADS:
FULL CIRCLE
RAINBIRD: 5006-MPR-25-F-SS
GPM:IN/HR (45 PSI)
3.82.0.68 — HALF CIRCLE
RAINBIRD: 5006-MPR-25-H-SS
GPM:IN/HR (45 PSI)
1.98.0.70 — QUARTER CIRCLE
RAINBIRD: 5006-MPR-25-H-SS
GPM:IN/HR (45 PSI)
1.0.0.71

SHRUB POP-UP SPRAY HEADS:
RAINBIRD: RD12-S-P45 BODY WITH RAINBIRD R-VAN 14, 18, AND 24 SERIES NOZZLES. (45 PSI REGULATION)
R-VAN 14: FULL, 210 DEGREE, HALF, AND QUARTER SPRAY PATTERNS.
GPM:IN/HR
R-VAN 18: FULL, 210 DEGREE, HALF, AND QUARTER SPRAY PATTERNS.
GPM:IN/HR
R-VAN 24: FULL, HALF, AND QUARTER SPRAY PATTERNS.
GPM:IN/HR

.75..75 .75..75 .5..75
1.5..75 1.25..75 1.0..75 .5..75
2..75 1.75..75 1.0..75
3.5..75

TREE BUBBLER HEADS (TWO HEADS PER TREE):
RAINBIRD: 1402 BUBBLER NOZZLE WITH INLINE CHECK VALVE.

SHRUB BUBBLER:
EMITTER TO BE RAINBIRD XBT-20 (2 GPH).
IH RISER TO BE BURIED A MINIMUM DEPTH OF 3" BELOW GRADE. HUNTER IH-RISER EXTENSION TO EACH BUBBLER NOT SHOWN. SEE DETAIL 1/L5.1.1 FOR INSTALLATION.
PVC SCHEDULE 40 LATERAL LINES SHOWN ON PLAN.
UNSIZED PIPE TO BE 3/4" SIZE. PVC SCHEDULE 40 SLEEVES ARE REQUIRED FOR ALL PIPING UNDER PAVEMENT.
B1
LIMITS OF SHRUB BUBBLER PLACEMENT
INDICATES HYDROZONE
PVC SCH 40 LATERAL LINE

GARDEN DRIP EMITTER:
RAINBIRD: XBD-080 WITH DIFFUSER BUG CAP, 1/4" TUBING STAKE, XQ 1/4" DISTRIBUTION TUBING, AND.
RETRO FIT PRESSURE REGULATOR (30 PSI REGULATION).
INSTALL 2.0 GPH XERI-BUG EMITTER CAPS ON BARBED EMITTER OUTLETS (48 REQUIRED)

AUTOMATIC DRIP IRRIGATION VALVE/FILTER/PRESSURE REGULATOR:
RAINBIRD CONTROL ZONE KIT MODELS XCZ-100-PRB-COM AND XCZ-150-PRB-COM
PRESSURE REGULATOR AS INDICATED ON VALVE ID.

INDICATES DRIP CONTROL VALVE:
PRESSURE REGULATOR: PSI SHOWN (// IF NOT SPECIFIED, ADJ IF ADJUSTABLE)
STATION NUMBER
VALVE SIZE
GALLONS: GPM

INDICATES CONTROL VALVE:
PRESSURE REGULATOR: PSI SHOWN (// IF NOT SPECIFIED, ADJ IF ADJUSTABLE)
STATION NUMBER
VALVE SIZE
GALLONS: GPM

SEE SHEET L3.3.1 FOR PRE-CONSTRUCTION SPRINKLER IRRIGATION NOTES AND SPRINKLER IRRIGATION NOTES.

20' 10' 0 20' 40'
SCALE: 1"= 20'-0"

AGENCY APPROVAL:

LODI USD

HMC DESIGN FOR GOOD Architects
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2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

NOTES

25-31

MTW group
LANDSCAPE ARCHITECTURE AND PLANNING
2707 K Street, Suite 201
Sacramento, CA 95816
916 369-3990

REGISTERED LANDSCAPE ARCHITECT — 5453 — CHRISTOPHER M. HOLLIS MILLER — 12/03/25 — 7/31/27 — STATE OF CALIFORNIA

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
SPRINKLER IRRIGATION PLAN

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

L3.1.1

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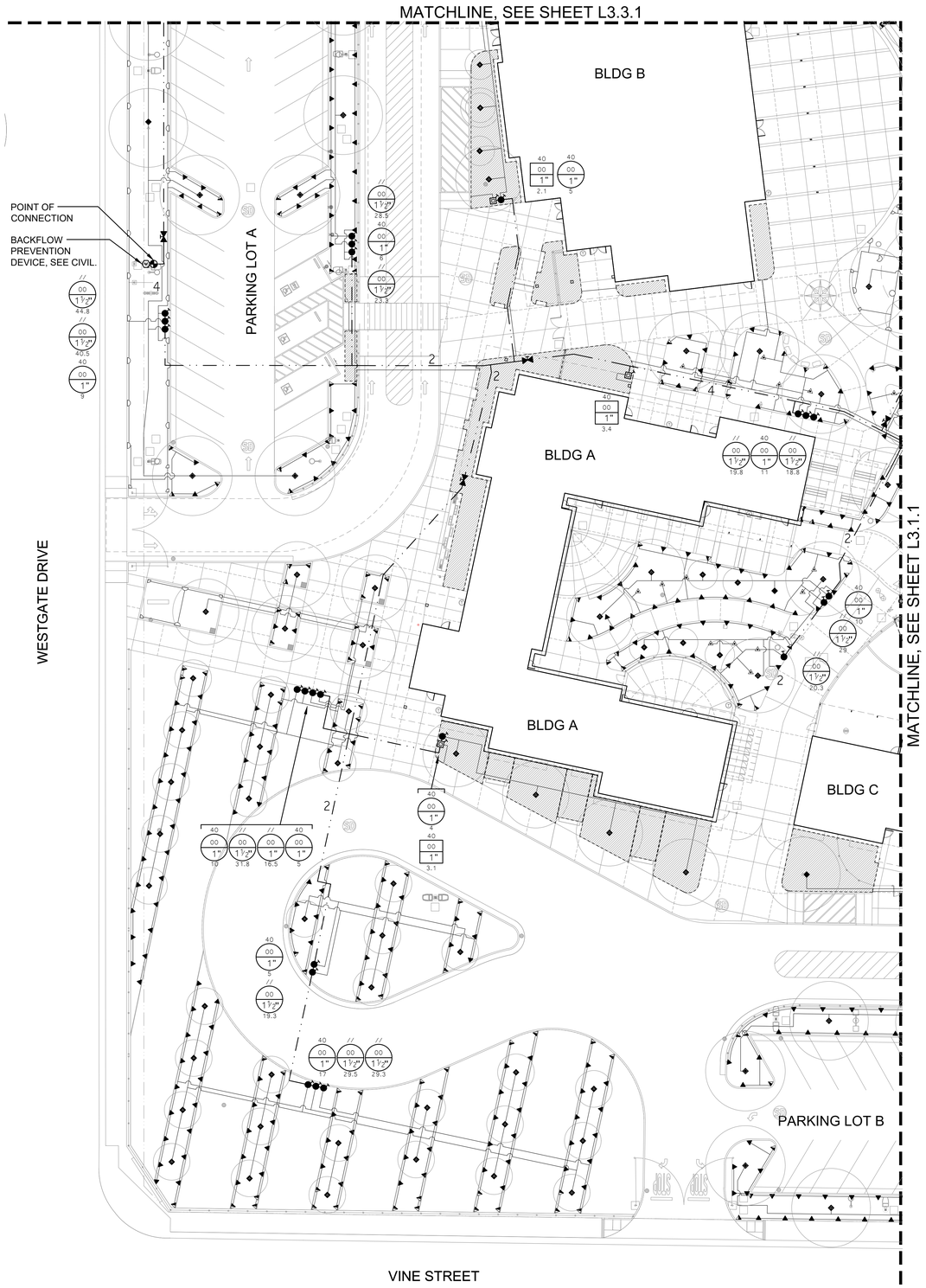

KEY

SPRINKLER IRRIGATION LEGEND

AUTOMATIC CONTROLLER 'A':
RAINBIRD ESP-LXME - 48 STATIONS
MODEL#: ICAB-RB3-48/SP/IQ-ETH/RSDE/IFS-400C/3200-400
CONTACT KIM GOLDENSTEIN AT IMPERIAL TECH SERVICES: 619-380-1833, kimgoldenstein1@gmail.com
CONTROLLER TO BE ASSEMBLED IN STAINLESS STEEL TOP ENTRY STRONGBOX ENCLOUSRE WITH ETHERNET MODEM, AND SURGE PROTECTION.

COORDINATE 110 SERVICE AND POWER CONNECTION WITH ELECTRICAL SUB-CONTRACTOR.
COORDINATE ETHERNET CONNECTION WITH THE ELECTRICAL SUB-CONTRACTOR.

AUTOMATIC CONTROLLER 'B':
RAINBIRD ESP-LXME - 36 STATIONS
MODEL#: ICAB-RB3-36/SP/IQ-ETH/RSDE/IFS-400C/3200-400
CONTACT KIM GOLDENSTEIN AT IMPERIAL TECH SERVICES: 619-380-1833, kimgoldenstein1@gmail.com
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COORDINATE 110 SERVICE AND POWER CONNECTION WITH ELECTRICAL SUB-CONTRACTOR.
COORDINATE ETHERNET CONNECTION WITH THE ELECTRICAL SUB-CONTRACTOR.

GROUNDING ROD ASSEMBLY:
SEE DETAIL 2/L4.2.1

POINT OF CONNECTION:
STATIC WATER PRESSURE PRIOR TO WATER METER: 44 PSI
DYNAMIC WATER PRESSURE AFTER IRRIGATION BACKFLOW DEVICE: 30 PSI
IRRIGATION SYSTEM OPERATING WATER PRESSURE: 40 PSI
MAXIMUM FLOW IS 90 GPM

CONTRACTOR SHALL LOCATE BACKFLOW PREVENTION DEVICE INDICATED ON CIVIL SHEETS.
CONNECT AT THIS POINT AND EXTEND AS INDICATED ON DRAWINGS.

BOOSTER PUMP:
BOOSTER PUMP SHALL BE BY V-POWER EQUIPMENT, INC.
MODEL#: 19GMTW/11192025-1-10VFD-460-3
CONTACT CHRIS MURRAY AT 916-266-6743.

INLET PRESSURE: 27 PSI
OUTLET PRESSURE: 76 PSI
MIN/MAX WATER DEMAND: 30GPM/190GPM
POWER INPUT: 480V, 3 PHASE

MASTER VALVE/FLOW SENSOR ASSEMBLY:
MASTER VALVE - 3" NORMALLY OPEN GRISWOLD #2160N
FLOW SENSOR - CST FSI-S30-001 WITH 3" SADDLE
FLOW SENSOR TO BE CONNECTED TO AUTOMATIC CONTROLLER WITH UF-14 WIRE.
MASTER VALVE TO BE CONNECTED TO AUTOMATIC CONTROLLER WITH UF-14 WIRE.

GATE VALVE:
TYPE:
4" SIZE: LEEMCO LMV-XXBB BELL WITH A NON-RISING STEM AND OPERATING NUT.
3" SIZE AND SMALLER: LEEMCO LGT-XXSS THREADED WITH A NON-RISING STEM AND HANDWHEEL.

GATE VALVE INSTALLED IN A VALVE BOX WITH TOP OF BOX SET FLUSH TO FINISH GRADE.
GATE VALVE TO BE LINE SIZE.

PRESSURE MAIN LINE:
TYPE:
4" SIZE : ASTM D2241 SDR 21, 200 PSI, RUBBER GASKETED WITH LEEMCO FITTINGS
2" SIZE AND SMALLER: ASTM D1785, PVC SCHEDULE 40 WITH LEEMCO FITTINGS.

TRENCH DEPTH:
IN PLANTED AREAS: 24" MINIMUM COVER.
UNDER PAVED AREAS: 24" MINIMUM COVER.
PVC SCHEDULE 40 SLEEVES ARE REQUIRED FOR ALL PIPING UNDER PAVEMENT.

LATERAL LINE:
TYPE:
ASTM D1785, PVC SCHEDULE 40, SOLVENT WELD ALL UNSIZED PIPE SHALL BE 3/4" SIZE.
TRENCH DEPTH:
IN PLANTED AREAS:
POP-UP SPRAY HEADS - 12" MINIMUM COVER.
ROTOR HEADS: - 18" MINIMUM COVER.
BUBBLER HEADS: - 12" MINIMUM COVER.
UNDER PAVED AREAS: 24" MINIMUM COVER.
PVC SCHEDULE 40 SLEEVES ARE REQUIRED FOR ALL PIPING UNDER PAVEMENT.

AUTOMATIC CONTROL VALVE:
RAINBIRD PEB-PRS-D SERIES, OR APPROVED EQUAL.
PRESSURE REGULATOR AS INDICATED ON VALVE ID.

QUICK COUPLER VALVE:
RAINBIRD 44NP, OR APPROVED EQUAL.
VALVES SHALL HAVE LOCKING RUBBER COVERS, INSTALLED IN VALVE BOXES. TOP OF VALVE BOX SHALL HAVE BOLT DOWN LID AND TOP SET LEVEL TO FINISH GRADE.

LAWN POP-UP ROTOR HEADS:
10/0.73 — FULL CIRCLE
RAINBIRD: 6504-FC-SS-8 (GREEN NOZZLE)
GPM/N/HR (60 PSI)
10/0.73 — THREE QUARTER CIRCLE
RAINBIRD: 6504-PC-SS-8 (GREEN NOZZLE)
GPM/N/HR (60 PSI)
10/0.73 — HALF CIRCLE
RAINBIRD: 6504-PC-SS-8 (GREEN NOZZLE)
GPM/N/HR (60 PSI)
10/0.73 — QUARTER CIRCLE
RAINBIRD: 6504-PC-SS-8 (GREEN NOZZLE)
GPM/N/HR (60 PSI)

LAWN POP-UP INTERMEDIATE ROTOR HEADS:
3.8/2.0.68 — FULL CIRCLE
RAINBIRD: 5006-MPR-25-F-SS
GPM/N/HR (45 PSI)
1.9/0.70 — HALF CIRCLE
RAINBIRD: 5006-MPR-25-H-SS
GPM/N/HR (45 PSI)
1.0/0.71 — QUARTER CIRCLE
RAINBIRD: 5006-MPR-25-H-SS
GPM/N/HR (45 PSI)

SHRUB POP-UP SPRAY HEADS:
RAINBIRD: RD12-S-P45 BODY WITH RAINBIRD R-VAN 14, 18, AND 24 SERIES NOZZLES. (45 PSI REGULATION)
R-VAN 14: FULL, 210 DEGREE, HALF, AND QUARTER SPRAY PATTERNS.
GPM/N/HR
R-VAN 18: FULL, 210 DEGREE, HALF, AND QUARTER SPRAY PATTERNS.
GPM/N/HR
R-VAN 24: FULL, HALF, AND QUARTER SPRAY PATTERNS.
GPM/N/HR

TREE BUBBLER HEADS (TWO HEADS PER TREE):
RAINBIRD: 1402 BUBBLER NOZZLE WITH INLINE CHECK VALVE.

SHRUB BUBBLER:
EMITTER TO BE RAINBIRD XBT-20 (2 GPH).
IH RISER TO BE BURIED A MINIMUM DEPTH OF 3" BELOW GRADE. HUNTER IH-RISER EXTENSION TO EACH BUBBLER NOT SHOWN. SEE DETAIL 1/L5.1.1 FOR INSTALLATION.
PVC SCHEDULE 40 LATERAL LINES SHOWN ON PLAN.
UNSIZED PIPE TO BE 3/4" SIZE. PVC SCHEDULE 40 SLEEVES ARE REQUIRED FOR ALL PIPING UNDER PAVEMENT.
LIMITS OF SHRUB BUBBLER PLACEMENT
INDICATES HYDROZONE
PVC SCH 40 LATERAL LINE

GARDEN DRIP EMITTER:
RAINBIRD: XBD-080 WITH DIFFUSER BUG CAP, 1/4" TUBING STAKE, XQ 1/4" DISTRIBUTION TUBING, AND.
RETRO FIT PRESSURE REGULATOR (30 PSI REGULATION).
INSTALL 2.0 GPH XERI-BUG EMITTER CAPS ON BARBED EMITTER OUTLETS (48 REQUIRED)

AUTOMATIC DRIP IRRIGATION VALVE/FILTER/PRESSURE REGULATOR:
RAINBIRD CONTROL ZONE KIT MODELS XCZ-100-PRB-COM AND XCZ-150-PRB-COM
PRESSURE REGULATOR AS INDICATED ON VALVE ID.

INDICATES DRIP CONTROL VALVE:
PRESSURE REGULATOR: PSI SHOWN (// IF NOT SPECIFIED, ADJ IF ADJUSTABLE)
STATION NUMBER
VALVE SIZE
GALLONS: GPM

INDICATES CONTROL VALVE:
PRESSURE REGULATOR: PSI SHOWN (// IF NOT SPECIFIED, ADJ IF ADJUSTABLE)
STATION NUMBER
VALVE SIZE
GALLONS: GPM

SEE SHEET L3.3.1 FOR PRE-CONSTRUCTION SPRINKLER IRRIGATION NOTES AND SPRINKLER IRRIGATION NOTES.

20' 10' 0 20' 40'
SCALE: 1"= 20'-0"

AGENCY APPROVAL:

LODI USD

HMC DESIGN FOR GOOD Architects
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

NOTES

25-31

MTW group
LANDSCAPE ARCHITECTURE AND PLANNING
2707 K Street, Suite 201
Sacramento, CA 95816
916 369-3990

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
SPRINKLER IRRIGATION PLAN

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

L3.2.1

PLEASE RECYCLE

THE LINE BROWN ABOVE IS EXACTLY 1" WHEN PLOTTED AT 24X36 SHEETS ORIGINAL PAGE SIZE

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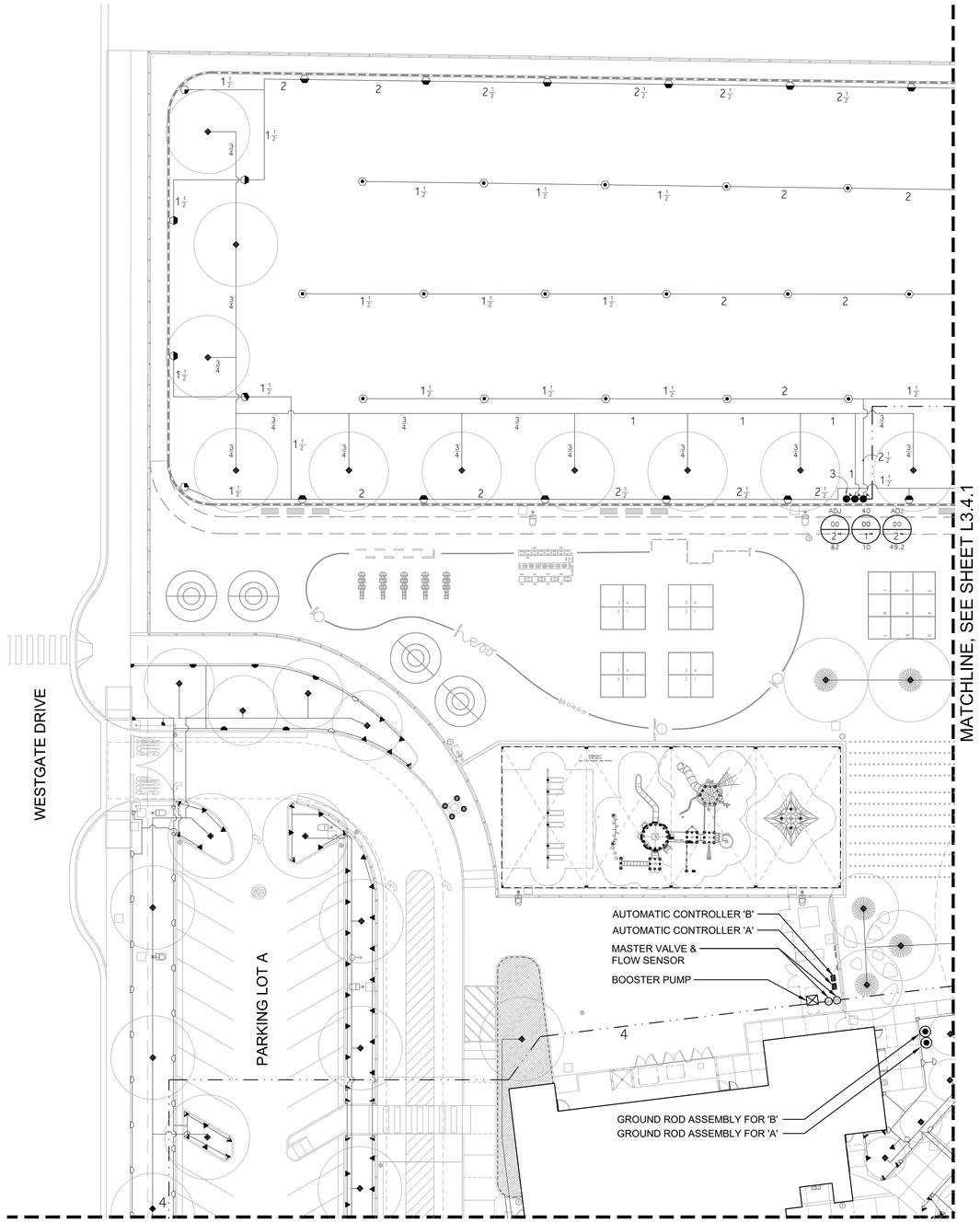
THE LINE BROKEN ABOVE IS EXACTLY 3" LONG ON ALL ARCH D SHEETS ORIGINAL PAGE SIZE



KEY / SPRINKLER IRRIGATION LEGEND

AUTOMATIC CONTROLLER 'A':
RAINBIRD ESP-LXME - 48 STATIONS
MODEL#: (CAB-RB3-48/SP/V2-ETH/RSDE/IFS-400C/3200-400
CONTACT KIM GOLDENSTEIN AT IMPERIAL TECH SERVICES: 619-380-1833, kimgoldenstein1@gmail.com
CONTROLLER TO BE ASSEMBLED IN STAINLESS STEEL TOP ENTRY STRONGBOX ENCLOUSRE WITH ETHERNET MODEM, AND SURGE PROTECTION.

COORDINATE 110 SERVICE AND POWER CONNECTION WITH ELECTRICAL SUB-CONTRACTOR.
COORDINATE ETHERNET CONNECTION WITH THE ELECTRICAL SUB-CONTRACTOR.

AUTOMATIC CONTROLLER 'B':
RAINBIRD ESP-LXME - 36 STATIONS
MODEL#: (CAB-RB-R3-36/SP/V2-ETH/RSDE/IFS-400C/3200-400
CONTACT KIM GOLDENSTEIN AT IMPERIAL TECH SERVICES: 619-380-1833, kimgoldenstein1@gmail.com
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COORDINATE 110 SERVICE AND POWER CONNECTION WITH ELECTRICAL SUB-CONTRACTOR.
COORDINATE ETHERNET CONNECTION WITH THE ELECTRICAL SUB-CONTRACTOR.

GROUNDING ROD ASSEMBLY:
SEE DETAIL 2/L4.2.1

POINT OF CONNECTION:
STATIC WATER PRESSURE PRIOR TO WATER METER: 44 PSI
DYNAMIC WATER PRESSURE AFTER IRRIGATION BACKFLOW DEVICE: 30 PSI
IRRIGATION SYSTEM OPERATING WATER PRESSURE: 40 PSI
MAXIMUM FLOW IS 90 GPM

CONTRACTOR SHALL LOCATE BACKFLOW PREVENTION DEVICE INDICATED ON CIVIL SHEETS.
CONNECT AT THIS POINT AND EXTEND AS INDICATED ON DRAWINGS.

BOOSTER PUMP:
BOOSTER PUMP SHALL BE BY V-POWER EQUIPMENT, INC.
MODEL#: 190MTW/11192025-1-10VFD-460-3
CONTACT CHRIS MURRAY AT 916-266-6743.

INLET PRESSURE: 27 PSI
OUTLET PRESSURE: 76 PSI
MIN/MAX WATER DEMAND: 30GPM/190GPM
POWER INPUT: 480V, 3 PHASE

MASTER VALVE/FLOW SENSOR ASSEMBLY:
MASTER VALVE = 3" NORMALLY OPEN GRISWOLD #2160N
FLOW SENSOR = CST FSI-S30-001 WITH 3" SADDLE
FLOW SENSOR TO BE CONNECTED TO AUTOMATIC CONTROLLER WITH UF-14 WIRE.
MASTER VALVE TO BE CONNECTED TO AUTOMATIC CONTROLLER WITH UF-14 WIRE.

GATE VALVE:
TYPE:
4" SIZE: LEEMCO LMV-XXBB BELL WITH A NON-RISING STEM AND OPERATING NUT.
3" SIZE AND SMALLER: LEEMCO LGT-XXSS THREADED WITH A NON-RISING STEM AND HANDWHEEL.

GATE VALVE INSTALLED IN A VALVE BOX WITH TOP OF BOX SET FLUSH TO FINISH GRADE.
GATE VALVE TO BE LINE SIZE.

PRESSURE MAIN LINE:
TYPE:
4" SIZE : ASTM D2241 SDR 21, 200 PSI, RUBBER GASKETED WITH LEEMCO FITTINGS
2" SIZE AND SMALLER: ASTM D1785, PVC SCHEDULE 40 WITH LEEMCO FITTINGS.

TRENCH DEPTH:
IN PLANTED AREAS: 24" MINIMUM COVER.
UNDER PAVED AREAS: 24" MINIMUM COVER.
PVC SCHEDULE 40 SLEEVES ARE REQUIRED FOR ALL PIPING UNDER PAVEMENT.

LATERAL LINE:
TYPE:
ASTM D1785, PVC SCHEDULE 40, SOLVENT WELD ALL UNSIZED PIPE SHALL BE 3/4" SIZE.
TRENCH DEPTH:
IN PLANTED AREAS:
POP-UP SPRAY HEADS - 12" MINIMUM COVER.
ROTOR HEADS: - 18" MINIMUM COVER.
BUBBLER HEADS: - 12" MINIMUM COVER.
UNDER PAVED AREAS: 24" MINIMUM COVER.
PVC SCHEDULE 40 SLEEVES ARE REQUIRED FOR ALL PIPING UNDER PAVEMENT.

AUTOMATIC CONTROL VALVE:
RAINBIRD PEB-PRS-D SERIES, OR APPROVED EQUAL.
PRESSURE REGULATOR AS INDICATED ON VALVE ID.

QUICK COUPLER VALVE:
RAINBIRD 44NP, OR APPROVED EQUAL.
VALVES SHALL HAVE LOCKING RUBBER COVERS, INSTALLED IN VALVE BOXES. TOP OF VALVE BOX SHALL HAVE BOLT DOWN LID AND TOP SET LEVEL TO FINISH GRADE.

LAWN POP-UP ROTOR HEADS:
10\0.73 — FULL CIRCLE
RAINBIRD: 6504-FC-SS-8 (GREEN NOZZLE)
GPM/IN/HR (60 PSI)
10\0.73 — THREE QUARTER CIRCLE
RAINBIRD: 6504-PC-SS-8 (GREEN NOZZLE)
GPM/IN/HR (60 PSI)
10\0.73 — HALF CIRCLE
RAINBIRD: 6504-PC-SS-8 (GREEN NOZZLE)
GPM/IN/HR (60 PSI)
10\0.73 — QUARTER CIRCLE
RAINBIRD: 6504-PC-SS-8 (GREEN NOZZLE)
GPM/IN/HR (60 PSI)

LAWN POP-UP INTERMEDIATE ROTOR HEADS:
3.82\0.68 — FULL CIRCLE
RAINBIRD: 5006-MPR-25-F-SS
GPM/IN/HR (45 PSI)
1.98\0.70 — HALF CIRCLE
RAINBIRD: 5006-MPR-25-H-SS
GPM/IN/HR (45 PSI)
1.0\0.71 — QUARTER CIRCLE
RAINBIRD: 5006-MPR-25-H-SS
GPM/IN/HR (45 PSI)

SHRUB POP-UP SPRAY HEADS:
RAINBIRD: RD12-S-P45 BODY WITH RAINBIRD R-VAN 14, 18, AND 24 SERIES NOZZLES. (45 PSI REGULATION)
R-VAN 14: FULL, 210 DEGREE, HALF, AND QUARTER SPRAY PATTERNS.
GPM/IN/HR
R-VAN 18: FULL, 210 DEGREE, HALF, AND QUARTER SPRAY PATTERNS.
GPM/IN/HR
R-VAN 24: FULL, HALF, AND QUARTER SPRAY PATTERNS.
GPM/IN/HR

TREE BUBBLER HEADS (TWO HEADS PER TREE):
RAINBIRD: 1402 BUBBLER NOZZLE WITH INLINE CHECK VALVE.

SHRUB BUBBLER:
EMITTER TO BE RAINBIRD XBT-20 (2 GPH).
IH RISER TO BE BURIED A MINIMUM DEPTH OF 3" BELOW GRADE. HUNTER IH-RISER EXTENSION TO EACH BUBBLER NOT SHOWN. SEE DETAIL 1/L5.1.1 FOR INSTALLATION.
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UNSIZED PIPE TO BE 3/4" SIZE. PVC SCHEDULE 40 SLEEVES ARE REQUIRED FOR ALL PIPING UNDER PAVEMENT.
B1
LIMITS OF SHRUB BUBBLER PLACEMENT
INDICATES HYDROZONE
PVC SCH 40 LATERAL LINE

GARDEN DRIP EMITTER:
RAINBIRD: XBD-080 WITH DIFFUSER BUG CAP, 1/4" TUBING STAKE, XQ 1/4" DISTRIBUTION TUBING, AND. RETRO FIT PRESSURE REGULATOR (30 PSI REGULATION).
INSTALL 2.0 GPH XERI-BUG EMITTER CAPS ON BARBED EMITTER OUTLETS (48 REQUIRED)

AUTOMATIC DRIP IRRIGATION VALVE/FILTER/PRESSURE REGULATOR:
RAINBIRD CONTROL ZONE KIT MODELS XCZ-100-PRB-COM AND XCZ-150-PRB-COM
PRESSURE REGULATOR AS INDICATED ON VALVE ID.

INDICATES DRIP CONTROL VALVE:
PRESSURE REGULATOR: PSI SHOWN (// IF NOT SPECIFIED, ADJ IF ADJUSTABLE)
STATION NUMBER
VALVE SIZE
GALLONS: GPM

40 / A1 / 1" / 00

INDICATES CONTROL VALVE:
PRESSURE REGULATOR: PSI SHOWN (// IF NOT SPECIFIED, ADJ IF ADJUSTABLE)
STATION NUMBER
VALVE SIZE
GALLONS: GPM

A2 / 1" / 00

PRE-CONSTRUCTION SPRINKLER IRRIGATION NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR REQUIRED TO CONTACT GROUNDS MANAGER AT GANTNER ELEMENTARY SCHOOL TO SET UP A MEETING ON SITE TO OPERATE THE EXISTING SPRINKLER IRRIGATION SYSTEM AND DISCUSS THE MODIFICATIONS THAT ARE TO BE MADE TO THE EXISTING SYSTEM TO ACCOMMODATE FOR THE NEW CONSTRUCTION.
2. CONTRACTOR TO OPERATE AND PROGRAM EXISTING SPRINKLER IRRIGATION SYSTEM THAT IS TO REMAIN IN ORDER TO PROVIDE WATER TO THE EXISTING LANDSCAPE TO REMAIN.
3. CONTRACTOR TO REMOVE ALL EXISTING PIPE AND SPRINKLER HEADS WHEN THEY ARE IN NEW PLANTING AREAS.
4. CONTRACTOR TO RESTORE AND REPAIR ANY EXISTING SPRINKLER IRRIGATION SYSTEM OR EXISTING LANDSCAPE WHICH IS IN AREAS TO REMAIN THAT IS DAMAGED BY NEW WORK.
5. ALL WORK TO EXISTING SPRINKLER IRRIGATION SYSTEM TO BE COMPLETED PRIOR TO SITE DEMOLITION.

SPRINKLER IRRIGATION NOTES

1. COMPOSITE BASE SHEET: PROPOSED IMPROVEMENTS SHOWN ON DRAWINGS ARE SUPERIMPOSED ON A COMPOSITE BASE SHEET. THE COMPOSITE BASE SHEET IS A COMPILATION OF ARCHITECTURAL, ENGINEERING, AND OTHER DATA THAT IS PROVIDED. THE LANDSCAPE ARCHITECT SHALL NOT BE HELD LIABLE FOR CHANGES, INACCURACIES, OMISSIONS, OR ERRORS PERTAINING TO THE COMPOSITE BASE SHEET. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THESE DOCUMENTS. ANY DISCREPANCIES NEED TO BE BROUGHT TO THE ATTENTION OF THE DESIGN TEAM AND RESOLVED PRIOR TO CONTINUATION OF WORK.
2. DESIGN PRESSURE SHOWN ON PLANS HAS BEEN FURNISHED BY WATER COMPANY OR WATER DISTRICT SERVING SITE. VERIFY PRESSURE ON-SITE PRIOR TO THE INSTALLATION OF ANY SPRINKLER IRRIGATION EQUIPMENT. IF THERE IS A DISCREPANCY, NOTIFY OWNER'S REPRESENTATIVE IMMEDIATELY IN WRITING SO ADJUSTMENTS CAN BE MADE BY LANDSCAPE ARCHITECT. FAILURE TO REPORT DISCREPANCIES AND CONTINUANCE OF WORK WILL RESULT IN ALL RE-DESIGN COSTS BEING CHARGED TO CONTRACTOR.
3. DETERMINE LOCATION OF UNDERGROUND UTILITIES. DAMAGE CAUSED BY INSTALLATION OF THIS WORK SHALL BE REPAIRED TO SATISFACTION OF GOVERNING AGENCY OR OWNER AT NO ADDITIONAL COST TO THE CONTRACT.
4. SPRINKLER OVER SPRAY SHALL NOT BE ALLOWED ON PUBLIC SIDEWALKS, BUILDING WALLS OR FENCES. MINIMUM OVERSPRAY MAY OCCUR IN PARKING AREAS. USE ADJUSTABLE NOZZLES WHENEVER POSSIBLE TO CONTROL SPRINKLER OVERSPRAY.
5. ALL LOCAL CODES AND ORDINANCES SHALL BE COMPLIED WITH. IF THERE IS A CONFLICT, NOTIFY OWNER'S REPRESENTATIVE IMMEDIATELY.
6. TESTING:
   A. PRESSURE TEST ALL UNDERGROUND PIPING AS FOLLOWS:
      SYSTEMS WITH BOOSTER PUMP:
      MAIN LINE - AT 100 PSI FOR 4 HOURS.
      LATERAL LINES - AT 100 PSI FOR 2 HOURS.
   B. COVERAGE TEST: NOTE: PRIOR TO REQUESTING COVERAGE TEST, INSURE ALL HEADS ARE SET PLUMB, NOZZLES ARE ADJUSTED PROPERLY AND SYSTEM HAS BEEN CHECKED FOR AUTOMATION. REQUEST OWNER'S REPRESENTATIVES PRESENCE ON-SITE WHEN SPRINKLER SYSTEM IS COMPLETELY INSTALLED AND FULLY AUTOMATIC. PROVIDE ADEQUATE PERSONNEL AT THIS MEETING TO ADJUST AND FINE TUNE SYSTEM TO SATISFACTION OF OWNER'S REPRESENTATIVE.

SPRINKLER IRRIGATION NOTES

7. LAYOUT ALL WORK PRIOR TO TRENCHING OPERATIONS TO DETERMINE IF MINOR MODIFICATIONS OR ADJUSTMENTS WILL BE REQUIRED.
8. INSTALL ALL SPRINKLER HEADS PERPENDICULAR TO SLOPES OR GRADE.
9. CONTROL WIRE SHALL BE UF-14, COLOR FOR LEAD AND WHITE FOR COMMON. SPLICES SHALL BE PERMITTED AT VALVE BOX LOCATIONS ONLY.
10. PROVIDE AND INSTALL AUTOMATIC CONTROLLER AND UF-14 CONTROL WIRE. ELECTRICAL SUBCONTRACTOR SHALL PROVIDE 110V SERVICE AND SERVICE HOOKUP FROM POWER SOURCE TO AUTOMATIC CONTROLLER.
11. COORDINATE ALL WORK WITH OTHER TRADES SO PROGRESS OF WORK IS NOT INTERRUPTED AND CAN BE COMPLETED IN A TIMELY MANNER.
12. NO PLANTING SHALL BE STARTED UNTIL ALL SPRINKLER WORK HAS BEEN TESTED AND APPROVED IN PRESENCE OF OWNER'S REPRESENTATIVE.
13. FOR SPRINKLER IRRIGATION INSTALLATION DETAILS, SEE SHEET NO. L4.2.1, L4.3.1, & L5.1.1.

20' 10' 0 20' 40'
SCALE: 1"= 20'-0"

AGENCY APPROVAL:

LODI USD

HMC DESIGN FOR GOOD Architects
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
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ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

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25-31

MTW group
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2707 K Street, Suite 201
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916 369-3990

FACILITY:
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2801 W VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
SPRINKLER IRRIGATION PLAN

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:
L3.3.1

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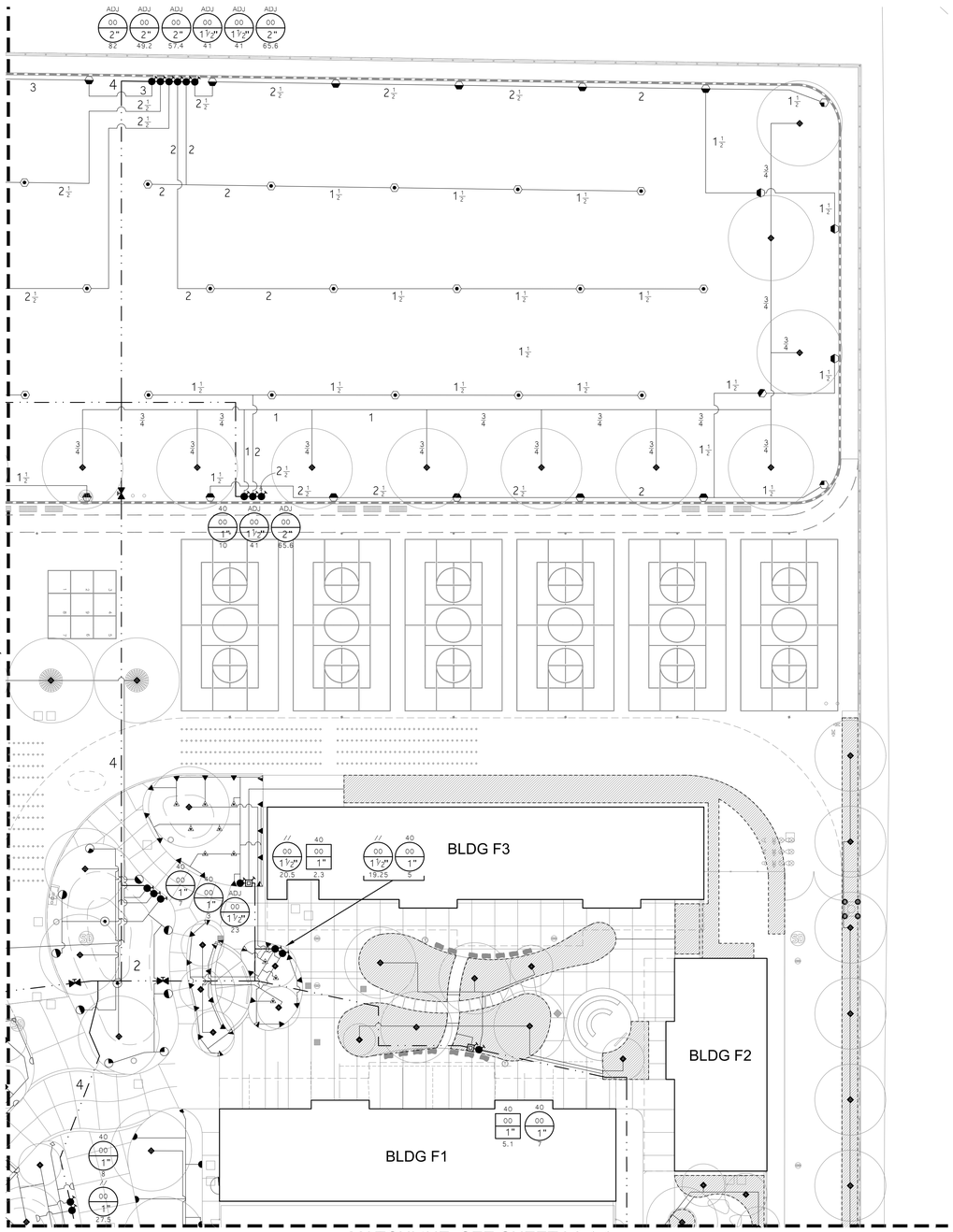
IF THIS LINE BROKEN ABOVE IS EXACTLY 1" THEN PLOT AT 11x17 SHEETS ORIGINAL PAGE SIZE



KEY

SPRINKLER IRRIGATION LEGEND

AUTOMATIC CONTROLLER 'A':
RAINBIRD ESP-LXME - 48 STATIONS
MODEL#: ICAB-RB3-48/SP/IQ-ETH/RSDE/IFS-400C/3200-400
CONTACT KIM GOLDENSTEIN AT IMPERIAL TECH SERVICES: 619-380-1833, kimgoldenstein1@gmail.com
CONTROLLER TO BE ASSEMBLED IN STAINLESS STEEL TOP ENTRY STRONGBOX ENCLOUSRE WITH ETHERNET MODEM, AND SURGE PROTECTION.

COORDINATE 110 SERVICE AND POWER CONNECTION WITH ELECTRICAL SUB-CONTRACTOR.
COORDINATE ETHERNET CONNECTION WITH THE ELECTRICAL SUB-CONTRACTOR.

AUTOMATIC CONTROLLER 'B':
RAINBIRD ESP-LXME - 36 STATIONS
MODEL#: ICAB-RB-R3-36/SP/IQ-ETH/RSDE/IFS-400C/3200-400
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COORDINATE ETHERNET CONNECTION WITH THE ELECTRICAL SUB-CONTRACTOR.

GROUNDING ROD ASSEMBLY:
SEE DETAIL 2/L4.2.1

POINT OF CONNECTION:
STATIC WATER PRESSURE PRIOR TO WATER METER: 44 PSI
DYNAMIC WATER PRESSURE AFTER IRRIGATION BACKFLOW DEVICE: 30 PSI
IRRIGATION SYSTEM OPERATING WATER PRESSURE: 40 PSI
MAXIMUM FLOW IS 90 GPM

CONTRACTOR SHALL LOCATE BACKFLOW PREVENTION DEVICE INDICATED ON CIVIL SHEETS.
CONNECT AT THIS POINT AND EXTEND AS INDICATED ON DRAWINGS.

BOOSTER PUMP:
BOOSTER PUMP SHALL BE BY V-POWER EQUIPMENT, INC.
MODEL#: 19GMTW/11192025-1-10VFD-460-3
CONTACT CHRIS MURRAY AT 916-266-6743.

INLET PRESSURE: 27 PSI
OUTLET PRESSURE: 76 PSI
MIN/MAX WATER DEMAND: 30GPM/190GPM
POWER INPUT: 480V, 3 PHASE

MASTER VALVE/FLOW SENSOR ASSEMBLY:
MASTER VALVE = 3" NORMALLY OPEN GRISWOLD #2160N
FLOW SENSOR = CST FSI-S30-001 WITH 3" SADDLE

FLOW SENSOR TO BE CONNECTED TO AUTOMATIC CONTROLLER WITH UF-14 WIRE.
MASTER VALVE TO BE CONNECTED TO AUTOMATIC CONTROLLER WITH UF-14 WIRE.

GATE VALVE:
TYPE:
4" SIZE: LEEMCO LMV-XXBB BELL WITH A NON-RISING STEM AND OPERATING NUT.
3" SIZE AND SMALLER: LEEMCO LGT-XXSS THREADED WITH A NON-RISING STEM AND HANDWHEEL.

GATE VALVE INSTALLED IN A VALVE BOX WITH TOP OF BOX SET FLUSH TO FINISH GRADE.
GATE VALVE TO BE LINE SIZE.

PRESSURE MAIN LINE:
TYPE:
4" SIZE : ASTM D2241 SDR 21, 200 PSI, RUBBER GASKETED WITH LEEMCO FITTINGS
2" SIZE AND SMALLER: ASTM D1785, PVC SCHEDULE 40 WITH LEEMCO FITTINGS.

TRENCH DEPTH:
IN PLANTED AREAS: 24" MINIMUM COVER.
UNDER PAVED AREAS: 24" MINIMUM COVER.
PVC SCHEDULE 40 SLEEVES ARE REQUIRED FOR ALL PIPING UNDER PAVEMENT.

LATERAL LINE:
TYPE:
ASTM D1785, PVC SCHEDULE 40, SOLVENT WELD ALL UNSIZED PIPE SHALL BE 3/4" SIZE.
TRENCH DEPTH:
IN PLANTED AREAS:
POP-UP SPRAY HEADS - 12" MINIMUM COVER.
ROTOR HEADS: - 18" MINIMUM COVER.
BUBBLER HEADS: - 12" MINIMUM COVER.
UNDER PAVED AREAS: 24" MINIMUM COVER.
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AUTOMATIC CONTROL VALVE:
RAINBIRD PEB-PRS-D SERIES, OR APPROVED EQUAL.
PRESSURE REGULATOR AS INDICATED ON VALVE ID.

QUICK COUPLER VALVE:
RAINBIRD 44NP, OR APPROVED EQUAL.
VALVES SHALL HAVE LOCKING RUBBER COVERS, INSTALLED IN VALVE BOXES. TOP OF VALVE BOX SHALL HAVE BOLT DOWN LID AND TOP SET LEVEL TO FINISH GRADE.

LAWN POP-UP ROTOR HEADS:
10/0.73 — FULL CIRCLE
RAINBIRD, 6504-FC-SS-8 (GREEN NOZZLE)
GPM/N/HR (60 PSI)
10/0.73 — THREE QUARTER CIRCLE
RAINBIRD, 6504-PC-SS-8 (GREEN NOZZLE)
GPM/N/HR (60 PSI)
10/0.73 — HALF CIRCLE
RAINBIRD, 6504-PC-SS-8 (GREEN NOZZLE)
GPM/N/HR (60 PSI)
10/0.73 — QUARTER CIRCLE
RAINBIRD, 6504-PC-SS-8 (GREEN NOZZLE)
GPM/N/HR (60 PSI)

LAWN POP-UP INTERMEDIATE ROTOR HEADS:
3.8/2.0.68 — FULL CIRCLE
RAINBIRD, 5006-MPR-25-F-SS
GPM/N/HR (45 PSI)
1.9/0.70 — HALF CIRCLE
RAINBIRD, 5006-MPR-25-H-SS
GPM/N/HR (45 PSI)
1.0/0.71 — QUARTER CIRCLE
RAINBIRD, 5006-MPR-25-H-SS
GPM/N/HR (45 PSI)

SHRUB POP-UP SPRAY HEADS:
RAINBIRD, RD12-S-P45 BODY WITH RAINBIRD R-VAN 14, 18, AND 24 SERIES NOZZLES. (45 PSI REGULATION)
R-VAN 14: FULL, 210 DEGREE, HALF, AND QUARTER SPRAY PATTERNS.
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GPM/N/HR
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GPM/N/HR

TREE BUBBLER HEADS (TWO HEADS PER TREE):
RAINBIRD: 1402 BUBBLER NOZZLE WITH INLINE CHECK VALVE.

SHRUB BUBBLER:
EMITTER TO BE RAINBIRD XBT-20 (2 GPH).
IH RISER TO BE BURIED A MINIMUM DEPTH OF 3" BELOW GRADE. HUNTER IH-RISER EXTENSION TO EACH BUBBLER NOT SHOWN. SEE DETAIL 1/L5.1.1 FOR INSTALLATION.
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LIMITS OF SHRUB BUBBLER PLACEMENT
INDICATES HYDROZONE
PVC SCH 40 LATERAL LINE

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RAINBIRD, XBD-080 WITH DIFFUSER BUG CAP, 1/4" TUBING STAKE, XQ 1/4" DISTRIBUTION TUBING, AND. RETRO FIT PRESSURE REGULATOR (30 PSI REGULATION).
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RAINBIRD CONTROL ZONE KIT MODELS XCZ-100-PRB-COM AND XCZ-150-PRB-COM
PRESSURE REGULATOR AS INDICATED ON VALVE ID.

INDICATES DRIP CONTROL VALVE:
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STATION NUMBER
VALVE SIZE
GALLONS: GPM

INDICATES CONTROL VALVE:
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STATION NUMBER
VALVE SIZE
GALLONS: GPM

PRE-CONSTRUCTION SPRINKLER IRRIGATION NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR REQUIRED TO CONTACT GROUNDS MANAGER AT GANTNER ELEMENTARY SCHOOL TO SET UP A MEETING ON SITE TO OPERATE THE EXISTING SPRINKLER IRRIGATION SYSTEM AND DISCUSS THE MODIFICATIONS THAT ARE TO BE MADE TO THE EXISTING SYSTEM TO ACCOMMODATE FOR THE NEW CONSTRUCTION.
2. CONTRACTOR TO OPERATE AND PROGRAM EXISTING SPRINKLER IRRIGATION SYSTEM THAT IS TO REMAIN IN ORDER TO PROVIDE WATER TO THE EXISTING LANDSCAPE TO REMAIN.
3. CONTRACTOR TO REMOVE ALL EXISTING PIPE AND SPRINKLER HEADS WHEN THEY ARE IN NEW PLANTING AREAS.
4. CONTRACTOR TO RESTORE AND REPAIR ANY EXISTING SPRINKLER IRRIGATION SYSTEM OR EXISTING LANDSCAPE WHICH IS IN AREAS TO REMAIN THAT IS DAMAGED BY NEW WORK.
5. ALL WORK TO EXISTING SPRINKLER IRRIGATION SYSTEM TO BE COMPLETED PRIOR TO SITE DEMOLITION.

SPRINKLER IRRIGATION NOTES

1. COMPOSITE BASE SHEET: PROPOSED IMPROVEMENTS SHOWN ON DRAWINGS ARE SUPERIMPOSED ON A COMPOSITE BASE SHEET. THE COMPOSITE BASE SHEET IS A COMPILATION OF ARCHITECTURAL, ENGINEERING, AND OTHER DATA THAT IS PROVIDED. THE LANDSCAPE ARCHITECT SHALL NOT BE HELD LIABLE FOR CHANGES, INACCURACIES, OMISSIONS, OR ERRORS PERTAINING TO THE COMPOSITE BASE SHEET. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THESE DOCUMENTS. ANY DISCREPANCIES NEED TO BE BROUGHT TO THE ATTENTION OF THE DESIGN TEAM AND RESOLVED PRIOR TO CONTINUATION OF WORK.
2. DESIGN PRESSURE SHOWN ON PLANS HAS BEEN FURNISHED BY WATER COMPANY OR WATER DISTRICT SERVING SITE. VERIFY PRESSURE ON-SITE PRIOR TO THE INSTALLATION OF ANY SPRINKLER IRRIGATION EQUIPMENT. IF THERE IS A DISCREPANCY, NOTIFY OWNER'S REPRESENTATIVE IMMEDIATELY IN WRITING SO ADJUSTMENTS CAN BE MADE BY LANDSCAPE ARCHITECT. FAILURE TO REPORT DISCREPANCIES AND CONTINUANCE OF WORK WILL RESULT IN ALL RE-DESIGN COSTS BEING CHARGED TO CONTRACTOR.
3. DETERMINE LOCATION OF UNDERGROUND UTILITIES. DAMAGE CAUSED BY INSTALLATION OF THIS WORK SHALL BE REPAIRED TO SATISFACTION OF GOVERNING AGENCY OR OWNER AT NO ADDITIONAL COST TO THE CONTRACT.
4. SPRINKLER OVER SPRAY SHALL NOT BE ALLOWED ON PUBLIC SIDEWALKS, BUILDING WALLS OR FENCES. MINIMUM OVERSPRAY MAY OCCUR IN PARKING AREAS. USE ADJUSTABLE NOZZLES WHENEVER POSSIBLE TO CONTROL SPRINKLER OVERSPRAY.
5. ALL LOCAL CODES AND ORDINANCES SHALL BE COMPLIED WITH. IF THERE IS A CONFLICT, NOTIFY OWNER'S REPRESENTATIVE IMMEDIATELY.
6. TESTING:
A. PRESSURE TEST ALL UNDERGROUND PIPING AS FOLLOWS:
SYSTEMS WITH BOOSTER PUMP-
MAIN LINE - AT 100 PSI FOR 4 HOURS.
LATERAL LINES - AT 100 PSI FOR 2 HOURS.
B. COVERAGE TEST: NOTE: PRIOR TO REQUESTING COVERAGE TEST, INSURE ALL HEADS ARE SET PLUMB, NOZZLES ARE ADJUSTED PROPERLY AND SYSTEM HAS BEEN CHECKED FOR AUTOMATION. REQUEST OWNER'S REPRESENTATIVES PRESENCE ON-SITE WHEN SPRINKLER SYSTEM IS COMPLETELY INSTALLED AND FULLY AUTOMATIC. PROVIDE ADEQUATE PERSONNEL AT THIS MEETING TO ADJUST AND FINE TUNE SYSTEM TO SATISFACTION OF OWNER'S REPRESENTATIVE.

SPRINKLER IRRIGATION NOTES

7. LAYOUT ALL WORK PRIOR TO TRENCHING OPERATIONS TO DETERMINE IF MINOR MODIFICATIONS OR ADJUSTMENTS WILL BE REQUIRED.
8. INSTALL ALL SPRINKLER HEADS PERPENDICULAR TO SLOPES OR GRADE.
9. CONTROL WIRE SHALL BE UF-14, COLOR FOR LEAD AND WHITE FOR COMMON. SPLICES SHALL BE PERMITTED AT VALVE BOX LOCATIONS ONLY.
10. PROVIDE AND INSTALL AUTOMATIC CONTROLLER AND UF-14 CONTROL WIRE. ELECTRICAL SUBCONTRACTOR SHALL PROVIDE 110V SERVICE AND SERVICE HOOKUP FROM POWER SOURCE TO AUTOMATIC CONTROLLER.
11. COORDINATE ALL WORK WITH OTHER TRADES SO PROGRESS OF WORK IS NOT INTERRUPTED AND CAN BE COMPLETED IN A TIMELY MANNER.
12. NO PLANTING SHALL BE STARTED UNTIL ALL SPRINKLER WORK HAS BEEN TESTED AND APPROVED IN PRESENCE OF OWNER'S REPRESENTATIVE.
13. FOR SPRINKLER IRRIGATION INSTALLATION DETAILS, SEE SHEET NO. L4.2.1, L4.3.1, & L5.1.1.

20' 10' 0 20' 40'
SCALE: 1"= 20'-0"

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PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
SPRINKLER IRRIGATION PLAN

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DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

L3.4.1

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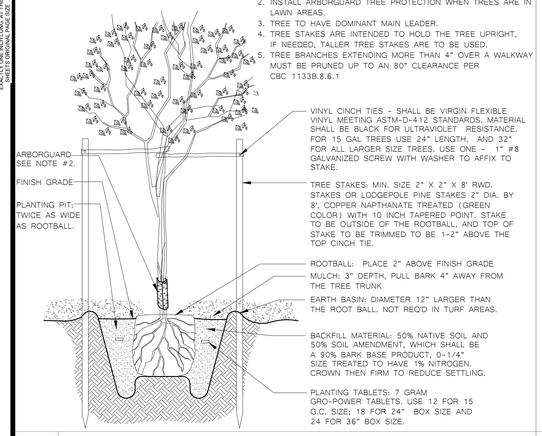
NOTES:
1. VITAMIN B-1: SUPERTHRIVE, LIQUINOX START OR EQUAL. APPLY AS PER MANUFACTURER'S INSTRUCTIONS WITH THE SECOND WATERING OF THE BASIN.
2. INSTALL ARBORGUARD TREE PROTECTION WHEN TREES ARE IN LAWN AREAS.
3. TREE TO HAVE DOMINANT MAIN LEADER.
4. TREE STAKES ARE INTENDED TO HOLD THE TREE UPRIGHT, IF NEEDED, TALLER TREE STAKES ARE TO BE USED.
5. TREE BRANCHES EXTENDING MORE THAN 4" OVER A WALKWAY MUST BE PRUNED UP TO AN 80" CLEARANCE PER CBC 11338.8.6.1



1 TREE PLANTING AND STAKING DETAIL

NOTE:
1. SEE TREE PLANTING DETAIL FOR ADDITIONAL INFORMATION.

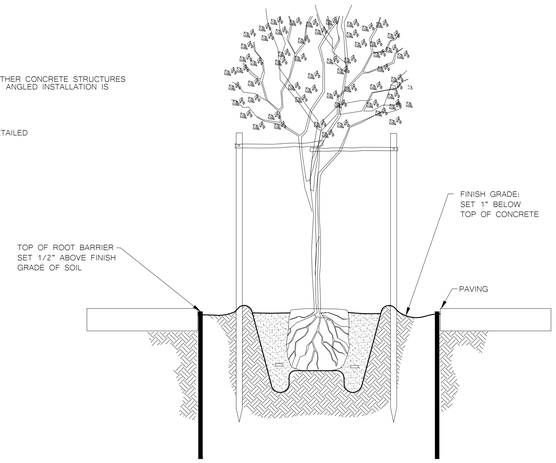
TREE ROOT BARRIER PROTECTION

1. CONTRACTOR TO REMOVE ALL CONCRETE SPOILS FROM FLATWORK, CURBS OR OTHER CONCRETE STRUCTURES TO ENSURE THE ROOT BARRIER IS ADJACENT TO THE CONCRETE AND VERTICAL. ANGLED INSTALLATION IS NOT ACCEPTABLE.
2. TREE SHALL BE LOCATED IN CENTER OR MIDPOINT OF PLANTER.
3. TREE ROOT BARRIER IS TO BE INSTALLED IN LOCATIONS SHOWN ON THE PLANS.
4. TREE ROOT BARRIER SHALL BE INSTALLED ADJACENT TO EDGE OF PAVING AS DETAILED
5. PLACE ROOT BARRIER SO THAT VERTICAL RIBS FACE TOWARD THE TREE.

ROOT BARRIER

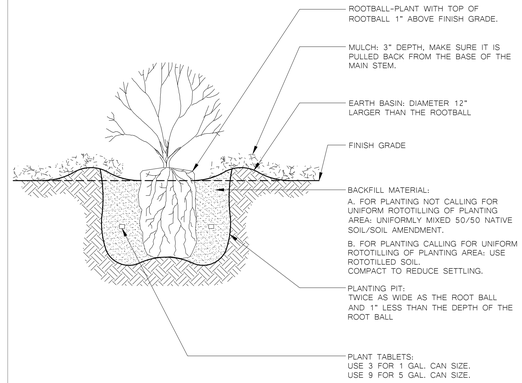
BY: DEEP ROOT PARTNERS OR NDS INC. OR APPROVED EQ.

15 GAL SIZE TREE OR LARGER:
24" MODULAR ROOT BARRIER PANEL



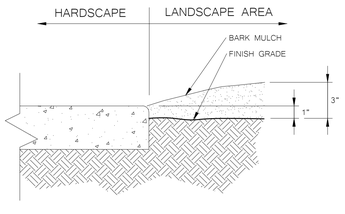
2 ROOT BARRIER CONTROL DETAIL

NOTE: VITAMIN B-1 SUPERTHRIVE LIQUINOX OR EQUAL. APPLY AS PER MANUFACTURE'S INSTRUCTIONS WITH SECOND WATERING OF THE BASIN.



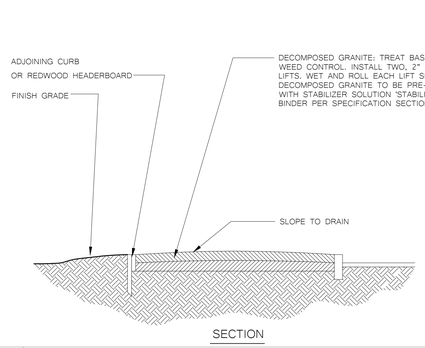
3 SHRUB PLANTING DETAIL

NOTES:
1. FINISH GRADE OF SOIL TO BE 1" BELOW ADJACENT HARDSCAPE FOR BOTH LAWN AREAS AND PLANTER BED AREAS
2. BARK MULCH DEPTH DOES NOT DICTATE THE ELEVATION OF THE FINISH GRADE
3. BARK MULCH TO BE FEATHERED DOWN TO 1" DEPTH, 12" FROM EDGE OF HARDSCAPE



4 LANDSCAPE GRADE ADJACENT TO HARDSCAPE DETAIL

NOTES:
1. SUBMIT SAMPLE TO ARCHITECT FOR APPROVAL PRIOR TO ORDERING.
2. DECOMPOSED GRANITE SHALL HAVE A MIXTURE OF FINE TO 3/8" SIZE PARTICLES WITH NO CLODS.
3. THE MATERIAL SHALL BE FREE OF VEGETATION, OTHER SOILS, DEBRIS AND ROCKS.
4. THE MATERIAL SHALL BE REDDISH-TAN IN COLOR.
5. THE MATERIAL SHALL BE OF SUCH NATURE THAT IT CAN BE COMPACTED READILY UNDER WATERING AND ROLLING.



SECTION

5 DECOMPOSED GRANITE/BINDER DETAIL

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LANDSCAPE PLANTING DETAILS

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L4.1.1

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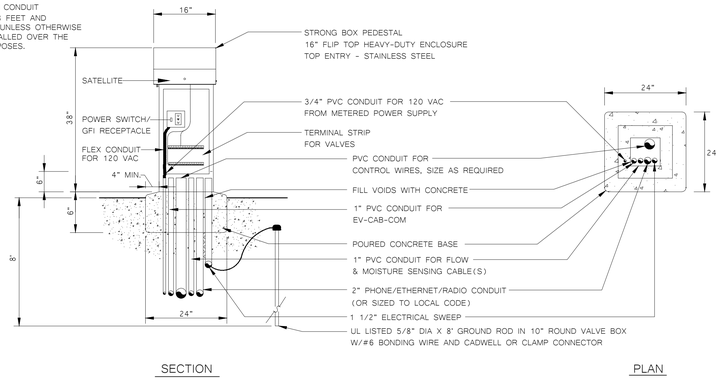
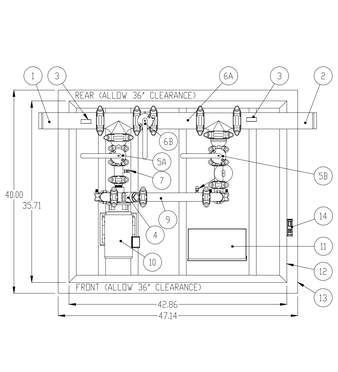
NOTE:
1. ASSEMBLY TO INCLUDE:
   CONTROLLER MODEL, ENCLOSURE MODEL, AND OPTIONS AS SPECIFIED
   TERMINAL STRIPS
   TEMPLETE AND BOLTS
   UL LISTED 8' COPPER GROUND ROD
   GROUND ROD CLAMP OR CADWELD
   10' OF #6 GROUNDING WIRE
2. ALL CABLES AND ELECTRICAL WIRES MUST BE RUN IN CONDUIT
3. GROUND ROD SHALL BE LOCATED NO CLOSER THAN 8 FEET AND NO FURTHER THAN 12 FEET FROM THE CONTROLLER UNLESS OTHERWISE SPECIFIED. A 10" ROUND VALVE BOX SHALL BE INSTALLED OVER THE GROUND ROD FOR LOCATION AND MAINTENANCE PURPOSES.

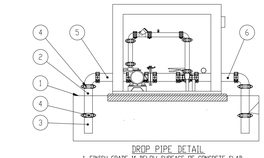


SECTION PLAN

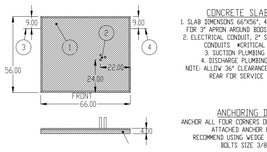
1 AUTOMATIC CONTROLLER - TOP ENTRY PEDESTAL DETAIL

NOTE
1. BOOSTER PUMP SHALL BE BY V. POWER EQUIPMENT, INC.
2. ALL INSTALLATION SHALL BE AS PER MANUFACTURERS RECOMMENDATIONS.
3. CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES SO WORK SCHEDULE IS MAINTAINED.
4. ALL PIPE ABOVE GROUND SHALL BE: SEE SPECIFICATIONS.
5. SHALL CONTACT "CHRIS MURRAY", (916-266-6743) FOR ORDERING INFORMATION.
6. FOLLOW INSTRUCTIONS INCLUDED WITH UNIT FOR STARTUP.
7. BOOSTER PUMP TO BE SET LEVEL AND WITH A HOUSEKEEPING CONCRETE PAD SET 1" ABOVE SURROUNDING GRADE.





DROP PIPE DETAIL
1. FINISH GRADE 1" BELOW SURFACE OF CONCRETE SLAB
2. 36" GROOVED GALVANIZED DROP PIPE WRAPPED WITH 10 MIL TAPE FOR BELOW GRADE PROTECTION
3. 10" GROOVED PVC CUT TO LENGTH TO ADAPT TO UNDERGROUND PLUMBING
4. GROOVED COUPLING WRAP WITH 10 MIL TAPE FOR BELOW GROUND APPLICATION
5. BOOSTER PLUMBING SUCTION
6. BOOSTER PLUMBING DISCHARGE
NOTE: FOUR CONCRETE THRUST BLOCKS WHERE NEEDED & TEST FOR LEAKS



CONCRETE SLAB DETAIL
1. SLAB DIMENSIONS 66"X56", 4" THICK MALLOWS FOR 3" APRON AROUND BOOSTER ENCLOSURE
2. ELECTRICAL CONDUIT, 2" SPACING BETWEEN CONDUITS *CRITICAL LOCATION
3. SUCTION PLUMBING LOCATION
4. DISCHARGE PLUMBING LOCATION
NOTE: ALLOW 36" CLEARANCE IN FRONT AND REAR FOR SERVICE ACCESS.

ANCHORING DETAIL
ANCHOR ALL FOUR CORNERS OF BOOSTER USING ATTACHED ANCHOR POINTS.
RECOMMEND USING WEDGE TYPE ANCHOR BOLTS SIZE 3/8"X3"

60"X50" CUSTOMFLOW BOOSTER PACKAGE INSTALLATION

A) CONCRETE PAD CONSTRUCTION
1) Determine location and grade for the site.
2) Form and pour a level concrete slab size 66" X 56", 4" thick.
Note: Slab surface 1" above grade, see slab detail for electrical conduit locations.
3) Allow for 36" in front and rear of the enclosure for service access.
4) Mount and level your Customflow booster on the concrete pad centering the unit allowing a 3" apron around the outside of the enclosure.
5) Anchor all four corners through the attached anchor brackets.
* Recommend using a wedge type anchor 3/8" X 3" long.

B) PLUMBING CONNECTION
FOR DROP PIPE CONNECTION
1) Connect the supplied grooved galvanized pipes to the suction and discharge 90's with the green couplings provided.
2) Measure and cut the supplied grooved PVC (not longer than 10") gluing the spigot end into your mainline.
3) Connect the PVC grooved end to the galvanized pipe from the booster with the supplied orange couplings.
4) Wrap the orange below grade couplings with 10 MIL tape.
5) Pour thrust blocks as needed.
6) Test for leaks.

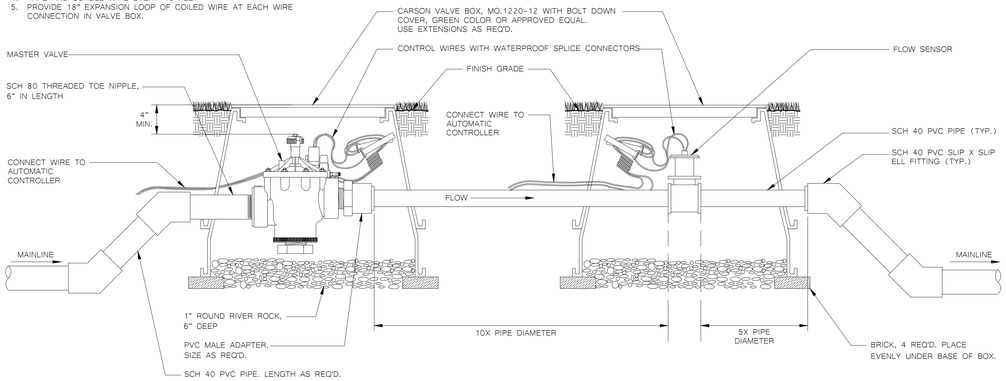
FOR FLANGED CONNECTION
1) Connect the supplied grooved flange adaptors to the suction and discharge 90's.
NOTE: The wide edge of the gasket goes towards the grooved flange, no other gaskets necessary.
2)Connect the suction and discharge flanges to the flanged mainline spools (supplied by others).
3) Pour thrust blocks as needed.
4) Test for leaks.

C) ELECTRICAL CONNECTION
1) Land the conduits and wires inside the VFD panel.
2) Confirm the supplied power voltage and phase is correct and matches the specification.
3) Terminate AC line wires at the top of the breaker labeled "CUSTOMER SUPPLY" and ground on the appropriate grounding lug.
4) Terminate 24VAC control wires to the terminal strip labeled "24R1 & 24N1" for pump start control. If a second pump start controller is being used terminate the second control to "24R2 & 24N2".
5) Make sure all wiring is done Per local code requirements.

D) START UP & WARRANTY
1) Verify the booster is installed properly, both plumbing and power connections are complete.
2) Contact V-Power Equipment Inc. for startup.
3) Standard Warranty is three years from date of delivery. For any warranty issues please call V-Power Equipment Inc.

2 BOOSTER PUMP DETAIL

NOTES:
1. SET VALVE BOX LEVEL WITH FINISH GRADE.
2. INSTALL VALVE BOX EXTENSIONS AS REQUIRED.
3. CONNECT ALL WIRES WITH WEATHER TIGHT CONNECTORS. SPLICES IN WIRE SHALL BE PERMITTED ONLY AT VALVE LOCATIONS.
4. TAPE AND BUNDLE WIRE EVERY 10 FEET
5. PROVIDE 18" EXPANSION LOOP OF COILED WIRE AT EACH WIRE CONNECTION IN VALVE BOX.



3 MASTER VALVE AND FLOW SENSOR DETAIL

DISTANCE CHART

REFER TO THE FOLLOWING TABLE THAT LISTS THE LENGTH (IN FEET) FOR EACH SIZE/TYPE FITTING WITHIN WHICH ALL JOINTS MUST BE RESTRAINED. ALL FITTINGS AND JOINT RESTRAINTS SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS & SPECIFICATIONS.

AS AN EXAMPLE, IF YOU ARE INSTALLING A 3" MAINLINE WITH A DIRECTIONAL CHANGE OF 90°, REFER TO CHART UNDER PIPE SIZE TO 3" AND UNDER BENDS 90 YOU WILL SEE THE DISTANCE OF 11'. IF THERE ARE ANY JOINTS (I.E. VALVE, BELL, ETC.) YOU MUST INSTALL A JOINT RESTRAINT ON THAT JOINT WITHIN 11' OF THE 90° MAINLINE DIRECTIONAL CHANGE.

PIPE SIZE	BENDS				REDUCERS			DEAD END	GATE VALVE
	11°	22°	45°	90°	1 STEP	2 STEP	3 STEP		
2"	1'	1'	2'	6'	-	-	-	19'	10'
2.5"	1'	2'	4'	9'	4'	-	-	23'	12'
3"	2'	3'	6'	11'	8'	10'	-	30'	15'
4"	2'	4'	8'	20'	14'	20'	31'	45'	23'
6"	3'	6'	13'	29'	30'	40'	53'	63'	31'
8"	4'	8'	15	38'	33'	55'	63'	75'	38'
10"	5'	9'	19'	45'	36'	56'	75'	96'	48'
12"	5'	10'	21'	53'	38'	60'	83'	112'	56'

NOTE: STEP REDUCTION EXAMPLE: 1 STEP (8 X 6), 2 STEP (8 X 4), 3 STEP (8 X 3)

INSTALLATION CHART

REFER TO THE FOLLOWING TABLE WHICH LISTS THE NUMBER OF BOLTS, SIZE, AND TORQUE FOR EACH BOLT IN REFERENCE TO THE SIZE OF PIPE WHICH IS BEING RESTRAINED.

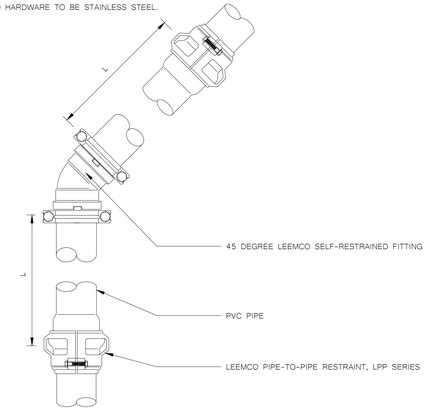
AS AN EXAMPLE, IF YOU HAVE A 3" PIPE, YOU WILL NEED 2 BOLTS THAT ARE 3/8 X 2.5" AND TIGHTEN THEM WITH A TORQUE WRENCH TO 20 FT-LBS.

PIPE SIZE	NO. BOLTS	BOLT SIZE	TORQUE FT-LBS.
2"	2	3/8" x 2.5"	20
2.5"	2	3/8" x 2.5"	20
3"	2	3/8" x 2.5"	20
4"	2	1/2" x 3.5"	50
6"	2	1/2" x 3.5"	50
8"	4	1/2" x 4"	50
10"	4	5/8" x 5.5"	100
12"	4	5/8" x 5.5"	100

CONTACT NUNZIO DICHRISTOPHER @ (916) 202-1333, THE LEEMCO REPRESENTATIVE, FOR ALL QUESTIONS CONCERNING LEEMCO PRODUCTS. COORDINATE AN INSTALLATION CLINIC WITH NUNZIO PRIOR TO INSTALLING THE MAINLINE.

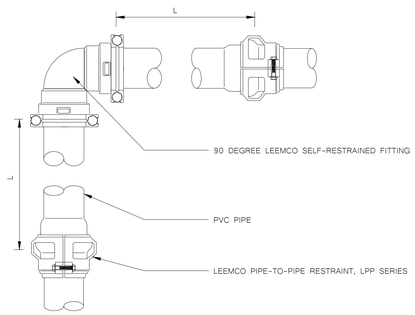
4 LEEMCO JOINT RESTRAINTS CHART

NOTES:
1. REFER TO LEEMCO MANUEL FOR JOINT RESTRAINT REQUIREMENTS FOR ALL FITTINGS.
   L = LENGTH IN WHICH JOINT RESTRAINT IS REQUIRED
2. ALL LEEMCO HARDWARE TO BE STAINLESS STEEL.



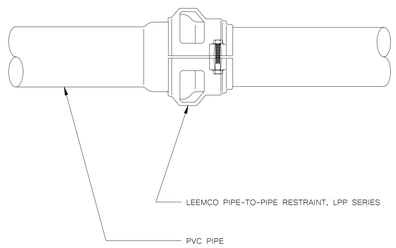
5 LEEMCO 45 ELBOW WITH JOINT RESTRAINTS DETAIL

NOTES:
1. REFER TO LEEMCO MANUEL FOR JOINT RESTRAINT REQUIREMENTS FOR ALL FITTINGS.
   L = LENGTH IN WHICH JOINT RESTRAINT IS REQUIRED
2. ALL LEEMCO HARDWARE TO BE STAINLESS STEEL.



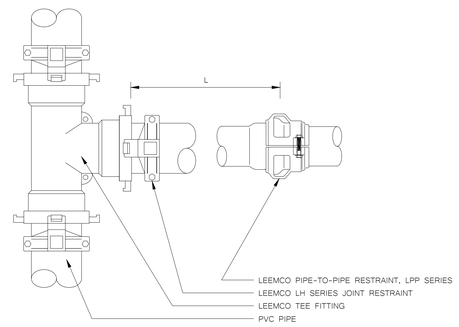
6 LEEMCO ELBOW WITH JOINT RESTRAINTS DETAIL

NOTES:
1. ALL LEEMCO HARDWARE TO BE STAINLESS STEEL.



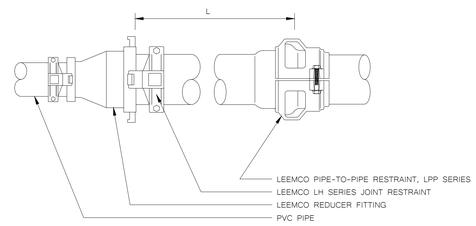
7 LEEMCO BELL JOINT RESTRAINTS DETAIL

NOTES:
1. REFER TO LEEMCO MANUEL FOR JOINT RESTRAINT REQUIREMENTS FOR ALL FITTINGS.
   L = LENGTH IN WHICH JOINT RESTRAINT IS REQUIRED
2. ALL LEEMCO HARDWARE TO BE STAINLESS STEEL.



8 LEEMCO TEE WITH JOINT RESTRAINTS DETAIL

NOTES:
1. REFER TO LEEMCO MANUEL FOR JOINT RESTRAINT REQUIREMENTS FOR ALL FITTINGS.
   L = LENGTH IN WHICH JOINT RESTRAINT IS REQUIRED
2. ALL LEEMCO HARDWARE TO BE STAINLESS STEEL.



9 LEEMCO REDUCER WITH JOINT RESTRAINTS DETAIL

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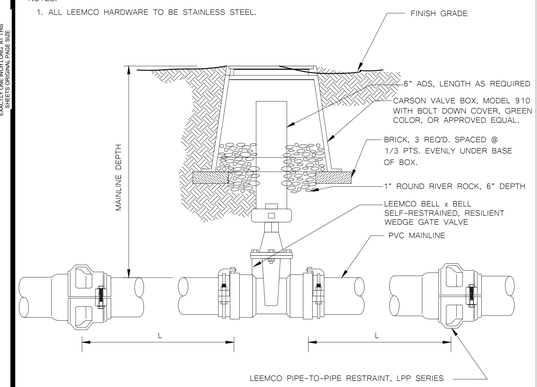
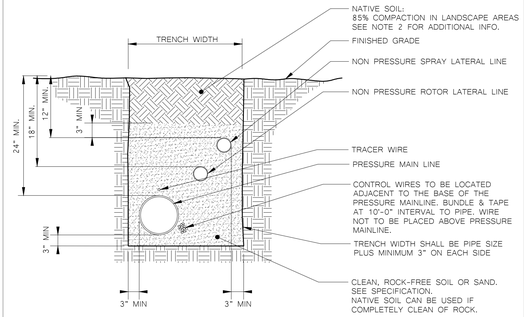
NOTES:
1. ALL LEEMCO HARDWARE TO BE STAINLESS STEEL.



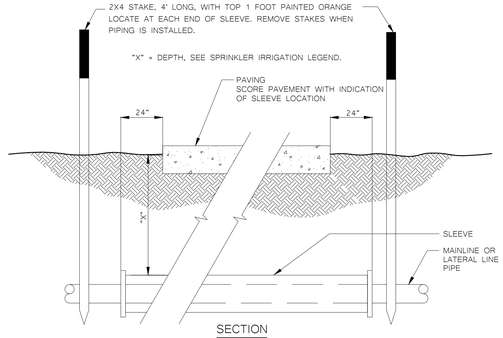
1 LEEMCO SELF-RESTRAINED GATE VALVE DETAIL

NOTES:
1. REFER TO SPECIFICATIONS AND PLAN SHEETS FOR MORE INFORMATION.
2. WHEN TRENCHES ARE LOCATED UNDER PAVEMENT, COMPACTION RATE FOR THE BACKFILL SHALL COMPLY WITH THE COMPACTION RATES REQUIRED FOR THOSE PAVING SECTIONS.
3. PIPES TO HAVE A MINIMUM OF 6" HORIZONTAL SEPARATION WHEN PLACED IN THE SAME TRENCH ALONG WITH A MINIMUM OF 6" VERTICAL SEPARATION BETWEEN PIPES.



2 PIPE TRENCH DETAIL

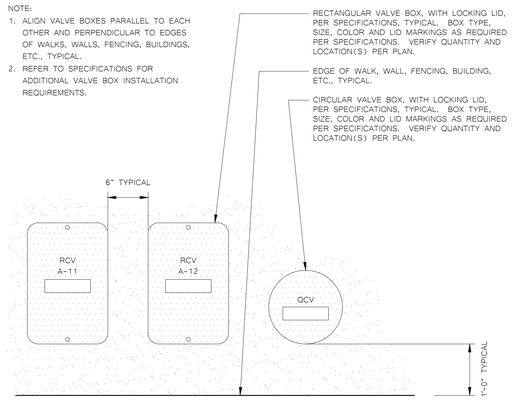
NOTES:
1. ALL PIPE AND FITTINGS TO BE SCHEDULE 40, P.V.C.
2. SLEEVES TO BE LARGE ENOUGH TO ACCEPT THE PIPE AND FITTINGS TO BE ENCASED.
3. PROVIDE A SEPARATE SLEEVE FOR EACH LATERAL OR MAIN CROSSING.
4. PROVIDE A SEPARATE SLEEVE FOR CONTROL WIRE
5. TAPE ALL ENDS WITH DUCT TAPE TO PREVENT ENTRY OF SOIL.



SECTION

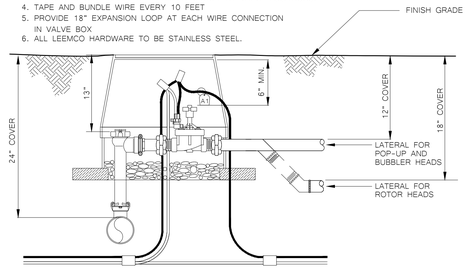
3 SLEEVE DETAIL

NOTE:
1. ALIGN VALVE BOXES PARALLEL TO EACH OTHER AND PERPENDICULAR TO EDGES OF WALKS, WALLS, FENCING, BUILDINGS, ETC., TYPICAL.
2. REFER TO SPECIFICATIONS FOR ADDITIONAL VALVE BOX INSTALLATION REQUIREMENTS.



4 TYPICAL VALVE BOX LAYOUT

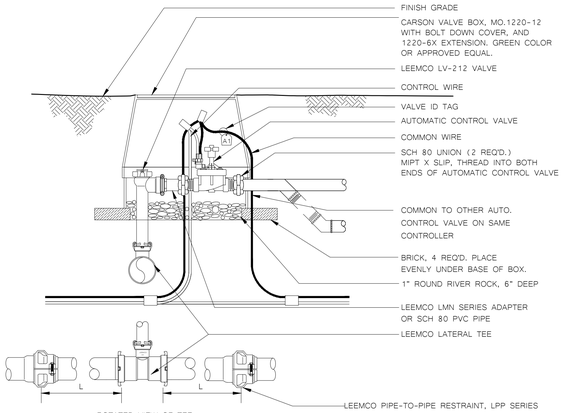
NOTES:
1. SET VALVE BOX LEVEL, PLACE LOCATOR INSIDE. VALVE BOX TO BE LEVEL WITH GRADE.
2. INSTALL VALVE BOX EXTENSIONS AS REQUIRED.
3. CONNECT ALL WIRES WITH WEATHER TIGHT CONNECTORS. SPLICES IN WIRE SHALL BE PERMITTED ONLY AT VALVE LOCATIONS.
4. TAPE AND BUNDLE WIRE EVERY 10 FEET
5. PROVIDE 18" EXPANSION LOOP AT EACH WIRE CONNECTION IN VALVE BOX
6. ALL LEEMCO HARDWARE TO BE STAINLESS STEEL.



6. FOR VALVES WITH PRESSURE REGULATION FEATURE, SET VALVE PRESSURE AS PER MANUFACTURERS RECOMMENDATIONS TO THE PRESSURE AS FOLLOWS:

POP-UP SPRAY HEADS:	35 - 40 PSI
INTERMEDIATE POP-UP ROTOR HEADS:	50 - 55 PSI
POP-UP ROTOR HEADS:	60 - 70 PSI
BUBBLER HEADS:	30 - 40 PSI
DRIP SYSTEMS:	15 - 20 PSI

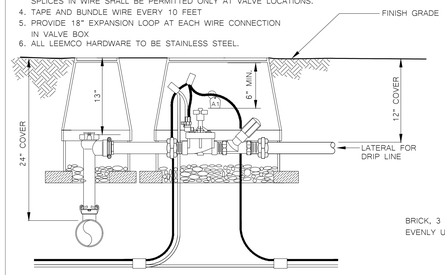
VALVE BOX, SETTINGS, AND CLEARANCES



COMPONENTS INSTALLATION

5 AUTOMATIC CONTROL VALVE/LEEMCO ANGLE VALVE DETAIL

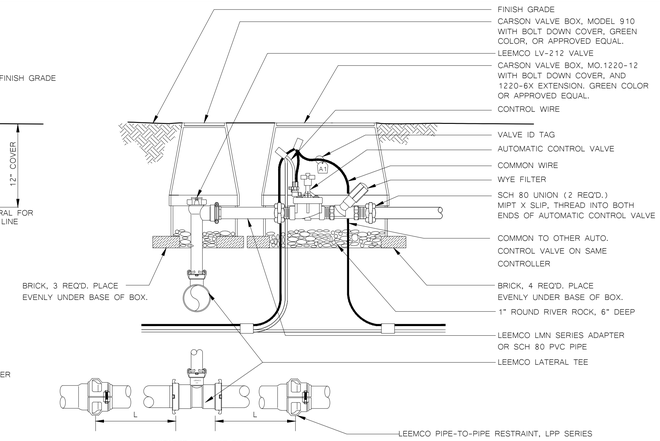
NOTES:
1. SET VALVE BOX LEVEL, PLACE LOCATOR INSIDE. VALVE BOX TO BE LEVEL WITH GRADE.
2. INSTALL VALVE BOX EXTENSIONS AS REQUIRED.
3. CONNECT ALL WIRES WITH WEATHER TIGHT CONNECTORS. SPLICES IN WIRE SHALL BE PERMITTED ONLY AT VALVE LOCATIONS.
4. TAPE AND BUNDLE WIRE EVERY 10 FEET
5. PROVIDE 18" EXPANSION LOOP AT EACH WIRE CONNECTION IN VALVE BOX
6. ALL LEEMCO HARDWARE TO BE STAINLESS STEEL.



6. FOR VALVES WITH PRESSURE REGULATION FEATURE, SET VALVE PRESSURE AS PER MANUFACTURERS RECOMMENDATIONS TO THE PRESSURE AS FOLLOWS:

DRIP SYSTEMS:	25 - 30 PSI

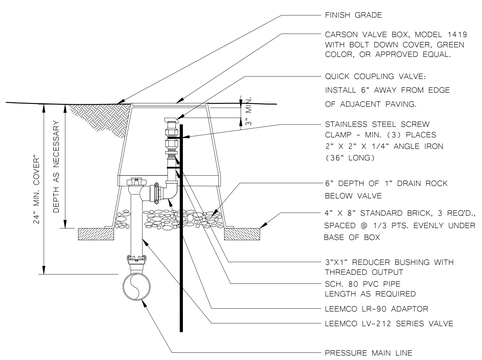
VALVE BOX, SETTINGS, AND CLEARANCES



COMPONENTS INSTALLATION

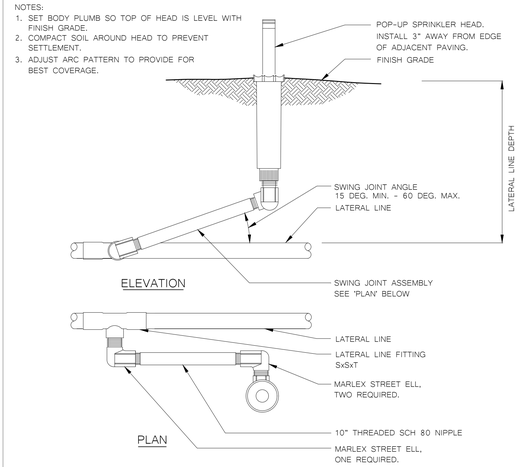
6 AUTOMATIC CONTROL DRIP VALVE/LEEMCO ANGLE VALVE DETAIL

NOTES:
1. INSTALL VALVE BOXES SO THAT THE TOP OF THE BOX IS FLUSH WITH THE TOP OF ADJACENT SURFACE.
2. USE TEFLON TAPE ON ALL THREADED CONNECTIONS.
3. ALL LEEMCO HARDWARE TO BE STAINLESS STEEL.



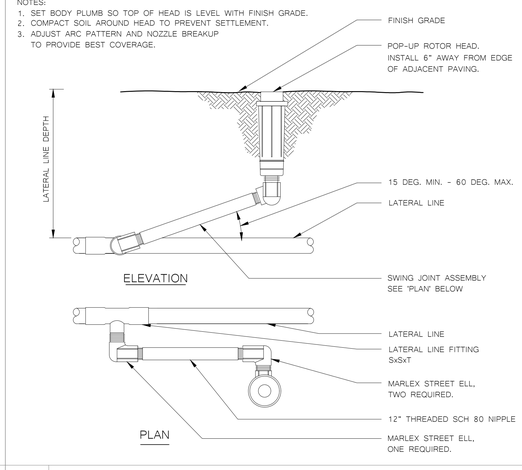
7 QUICK COUPLING VALVE/LEEMCO ANGLE VALVE DETAIL

NOTES:
1. SET BODY PLUMB SO TOP OF HEAD IS LEVEL WITH FINISH GRADE.
2. COMPACT SOIL AROUND HEAD TO PREVENT SETTLEMENT.
3. ADJUST ARC PATTERN TO PROVIDE FOR BEST COVERAGE.



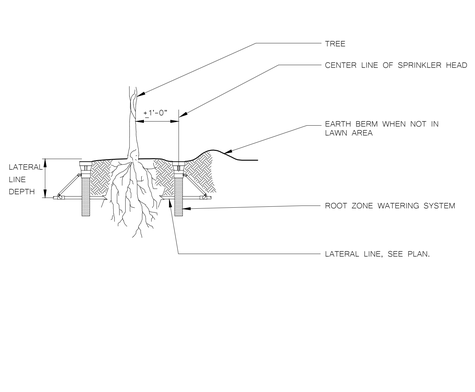
8 POP-UP SPRINKLER HEAD DETAIL

NOTES:
1. SET BODY PLUMB SO TOP OF HEAD IS LEVEL WITH FINISH GRADE.
2. COMPACT SOIL AROUND HEAD TO PREVENT SETTLEMENT.
3. ADJUST ARC PATTERN AND NOZZLE BREAKUP TO PROVIDE BEST COVERAGE.



9 POP-UP ROTOR HEAD DETAIL

NOTES:
1. SEE TREE PLANTING DETAIL FOR ADDITIONAL INFORMATION.
2. INSTALL RZWS SLEEVE OVER TUBE TO HELP PREVENT SOIL INTRUSION.



10 TREE BUBBLER HEAD DETAIL

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25-31

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PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
SPRINKLER IRRIGATION DETAILS

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DATE: 12/09/2025 | CLIENT PROJ NO:

SHEET:
L4.3.1

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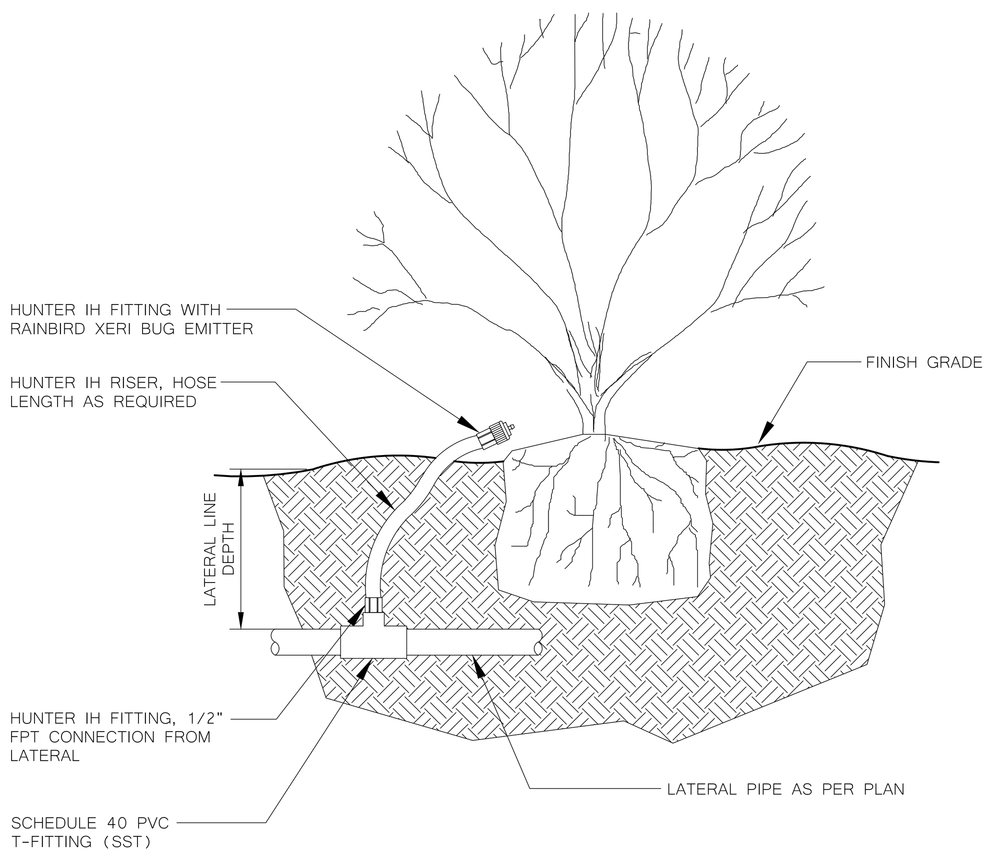
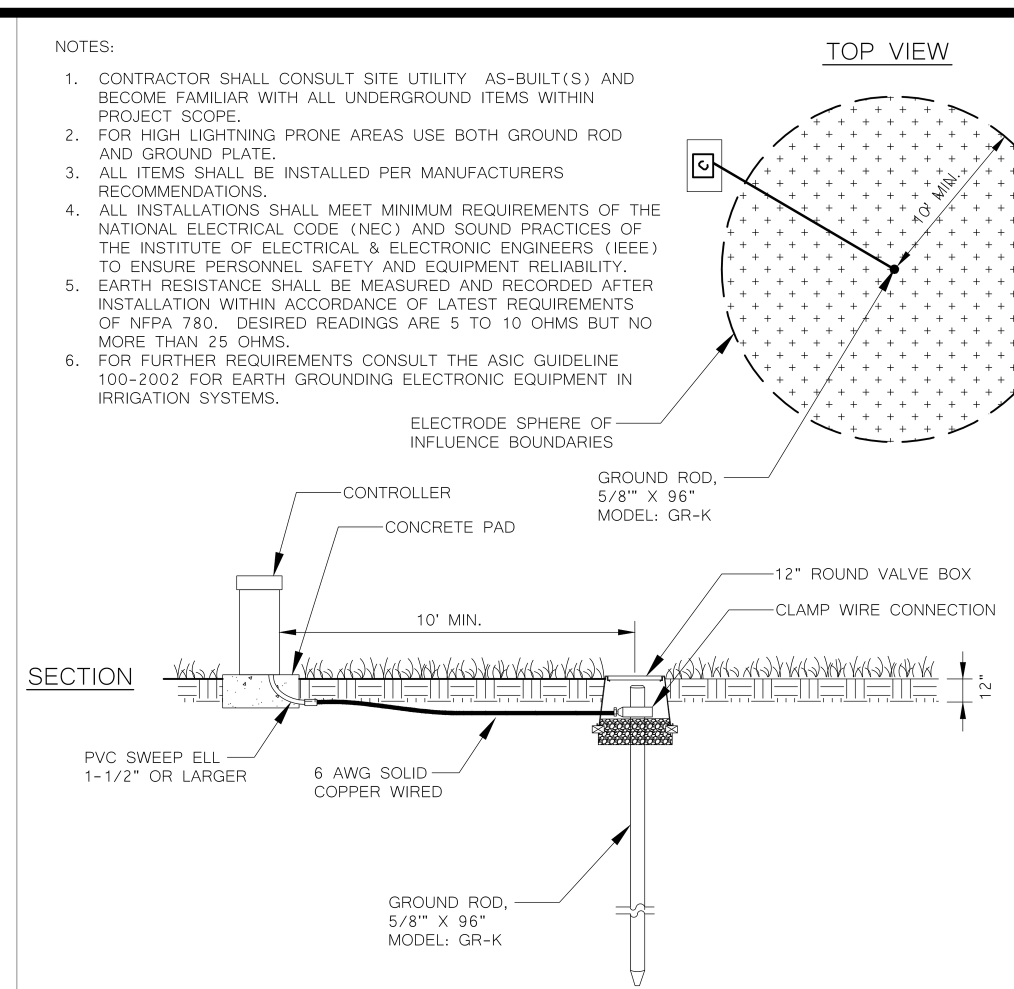


1 SHRUB BUBBLER DETAIL

NOTES:

1. CONTRACTOR SHALL CONSULT SITE UTILITY AS-BUILT(S) AND BECOME FAMILIAR WITH ALL UNDERGROUND ITEMS WITHIN PROJECT SCOPE.
2. FOR HIGH LIGHTNING PRONE AREAS USE BOTH GROUND ROD AND GROUND PLATE.
3. ALL ITEMS SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS.
4. ALL INSTALLATIONS SHALL MEET MINIMUM REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AND SOUND PRACTICES OF THE INSTITUTE OF ELECTRICAL & ELECTRONIC ENGINEERS (IEEE) TO ENSURE PERSONNEL SAFETY AND EQUIPMENT RELIABILITY.
5. EARTH RESISTANCE SHALL BE MEASURED AND RECORDED AFTER INSTALLATION WITHIN ACCORDANCE OF LATEST REQUIREMENTS OF NFPA 780. DESIRED READINGS ARE 5 TO 10 OHMS BUT NO MORE THAN 25 OHMS.
6. FOR FURTHER REQUIREMENTS CONSULT THE ASIC GUIDELINE 100-2002 FOR EARTH GROUNDING ELECTRONIC EQUIPMENT IN IRRIGATION SYSTEMS.



2 GROUNDING ROD ASSEMBLY DETAIL

IRRIGATION SCHEDULE TABLE

STATION #/HYDROZONE	PLANT WATER USE TYPE	PLANT FACTOR (PF)	IRRIGATION TYPE	FLOW (GPM)	PRECIP. RATE (PR) INCH/HR	IRRIGATION EFFICIENCY (IE)	SOIL TYPE	ROOT DEPTH	SLOPE	EXPOSURE
1	LAWN - HIGH	0.8	6504 ROTORS	574.0	0.73	0.75	CLAY LOAM	6"	0-5%	FULL SUN
2	LAWN - HIGH	0.8	5006 MPR ROTORS	5.0	0.70	0.75	CLAY LOAM	6"	0-5%	FULL SUN
3	SHRUB - LOW	0.3	RVAN SPRAY NOZZLES	0.0	0.75	0.75	CLAY LOAM	12-24"	0-5%	FULL SUN
4	SHRUB - LOW	0.3	POINT SOURCE DRIP	0.0	0.50	0.81	CLAY LOAM	12-24"	0-5%	FULL SUN
5	TREE - MEDIUM	0.4	1402 BUBBLERS	458.0	0.50	0.81	CLAY LOAM	12-24"	0-5%	FULL SUN

MAINTENANCE PERIOD (X/Y Z GAL)

STATION	JANUARY	FEBUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMEBER	DECEMBER
1	0 /1 0 GAL	0 /1 0 GAL	26 /1 66,729 GAL	33 /2 166,822 GAL	42 /3 316,961 GAL	29 /5 372,568 GAL	32 /5 400,372 GAL	23 /6 355,330 GAL	31 /3 239,111 GAL	48 /1 122,336 GAL	0 /1 0 GAL	0 /1 0 GAL
2	0 /1 0 GAL	0 /1 0 GAL	27 /1 606 GAL	34 /2 1,515 GAL	43 /3 2,879 GAL	31 /5 3,384 GAL	33 /5 3,637 GAL	24 /6 3,228 GAL	33 /3 2,172 GAL	50 /1 1,111 GAL	0 /1 0 GAL	0 /1 0 GAL
3	0 /1 0 GAL	0 /1 0 GAL	10 /1 0 GAL	12 /2 0 GAL	15 /3 0 GAL	11 /5 0 GAL	12 /5 0 GAL	9 /6 0 GAL	11 /3 0 GAL	18 /1 0 GAL	0 /1 0 GAL	0 /1 0 GAL
4	0 /1 0 GAL	0 /1 0 GAL	13 /1 0 GAL	17 /2 0 GAL	21 /3 0 GAL	15 /5 0 GAL	16 /5 0 GAL	12 /6 0 GAL	16 /3 0 GAL	24 /1 0 GAL	0 /1 0 GAL	0 /1 0 GAL
5	0 /1 0 GAL	0 /1 0 GAL	18 /1 35,989 GAL	22 /2 89,972 GAL	28 /3 170,946 GAL	20 /5 200,936 GAL	21 /5 215,932 GAL	16 /6 191,639 GAL	21 /3 128,959 GAL	33 /1 65,979 GAL	0 /1 0 GAL	0 /1 0 GAL
MONTHLY RAINFALL (CITY)	3.2	3.0	2.1	1.3	0.6	0.2	0.1	0.0 1	0.1	0.8	1.6	3
MONTHLY ET (CITY)	1.0 JAN	1.6 FEB	3.3 MAR	4.3 APR	6.3 MAY	6.9 JUN	7.3 JUL	6.4 AUG	4.4 SEP	3.0 OCT	1.4 NOV	0.8 DEC
MONTHLY TOTALS (GAL)	0 GAL	0 GAL	103,323 GAL	258,309 GAL	490,786 GAL	576,889 GAL	619,941 GAL	550,197 GAL	370,242 GAL	189,426 GAL	0 GAL	0 GAL

LANDSCAPE HYDROZONE INFORMATION TABLE

STATION #/HYDROZONE	PLANT WATER USE TYPE	IRRIGATION TYPE	HYDROZONE AREA (HA) (SQ.FT.)	% OF TOTAL LANDSCAPE AREA
1	LAWN - HIGH	SPRAY	84,166	50.6%
2	LAWN - HIGH	SPRAY	9,043	5.4%
3	SHRUB - LOW	SPRAY	47,827	28.7%
4	SHRUB - LOW	DRIP	20,811	12.5%
5	TREE - MEDIUM	DRIP	4,580	2.8%
		TOTAL AREA	166,427	100.0%

IRRIGATION HYDROZONE INFORMATION TABLE

STATION #/HYDROZONE	PLANT WATER USE TYPE	PLANT FACTOR (PF)	HYDROZONE AREA (HA) (SQ.FT.)	PF x HA (SQ.FT.)	IRRIGATION EFFICIENCY (IE)	ETWU (GALLONS)
1	LAWN - HIGH	0.8	84,166	67332.8	0.75	2,599,405
2	LAWN - HIGH	0.8	9,043	7234.4	0.75	279,286
3	SHRUB - LOW	0.3	47,827	14348.1	0.75	553,913
4	SHRUB - LOW	0.3	20,811	6243.3	0.81	223,171
5	TREE - MEDIUM	0.4	4,580	1832.0	0.81	65,486
		TOTAL AREA	166,427		ETWU TOTAL	3,721,262
		TOTAL AREA (SLA)	93,209			
Eto (Lodi)	46.7					
ESTIMATED TOTAL WATER USAGE (ETWU) = (ETo)(0.62)((PF)(HA)/IE+SLA) = GAL/YEAR						
MAXIMUM APPLIED WATER ALLOWANCE (MAWA) = (ETo)(0.62)[(0.65 x LA)+(0.35 x SLA)] = GAL/YEAR						
					MAWA TOTAL	4,076,743

Plant Water Use Type		Plant Factor
Very Low		0 - 0.1
Low		0.2 - 0.3
Medium		0.4 - 0.6
High		0.7 - 1.0
SLA		1.0
Irrigation Efficiency		**IE**
Overhead		0.75
Drip		0.81

PRESSURE LOSS CALCULATIONS

1. STATIC WATER PRESSURE BEFORE BACKFLOW: 61 PSI
2. DYNAMIC WATER PRESSURE AFTER BACKFLOW: 49 PSI
3. MAINLINE (4" SIZE) TO BOOSTER PUMP : 3 PSI LOSS
4. TOTAL PRESSURE LOSS BEFORE BOOSTER PUMP: 15 PSI
5. INLET PRESSURE AT BOOSTER PUMP: 46 PSI

6. BOOSTER PUMP: 40 PSI BOOST
7. OUTLET PRESSURE AT BOOSTER PUMP: 86 PSI
8. MASTER VALVE (3" NORMALLY OPEN GRISWOLD #2160N): 4.25 PSI LOSS
9. FLOW SENSOR (3" CST SADDLE): 0 PSI LOSS

10. 4" MAINLINE (TO FARTHEST VALVE): 3.5 PSI LOSS
11. FARTHEST VALVE (2" RAINBIRD PEB): 4.65 PSI LOSS
12. LATERAL LINE TO FARTHEST VALVE (VARIOUS SIZES): 3.4 PSI LOSS
13. TOTAL PRESSURE LOSS AFTER BOOSTER PUMP: 16 PSI
14. FINAL PRESSURE AT FARTHEST HEAD: 70 PSI

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LICENSED LANDSCAPE ARCHITECT BRYAN HOLLIS WALKER 5453 SIGNATURE 12/03/25 DATE 7/31/27 RENEWAL DATE STATE OF CALIFORNIA

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PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
MWELO CHARTS AND CALCULATIONS, PRESSURE LOSS CALCULATIONS AND SPRINKLER IRRIGATION DETAIL

DSA SUBMITTAL

DATE: **12/09/2025** CLIENT PROJ NO:

SHEET:
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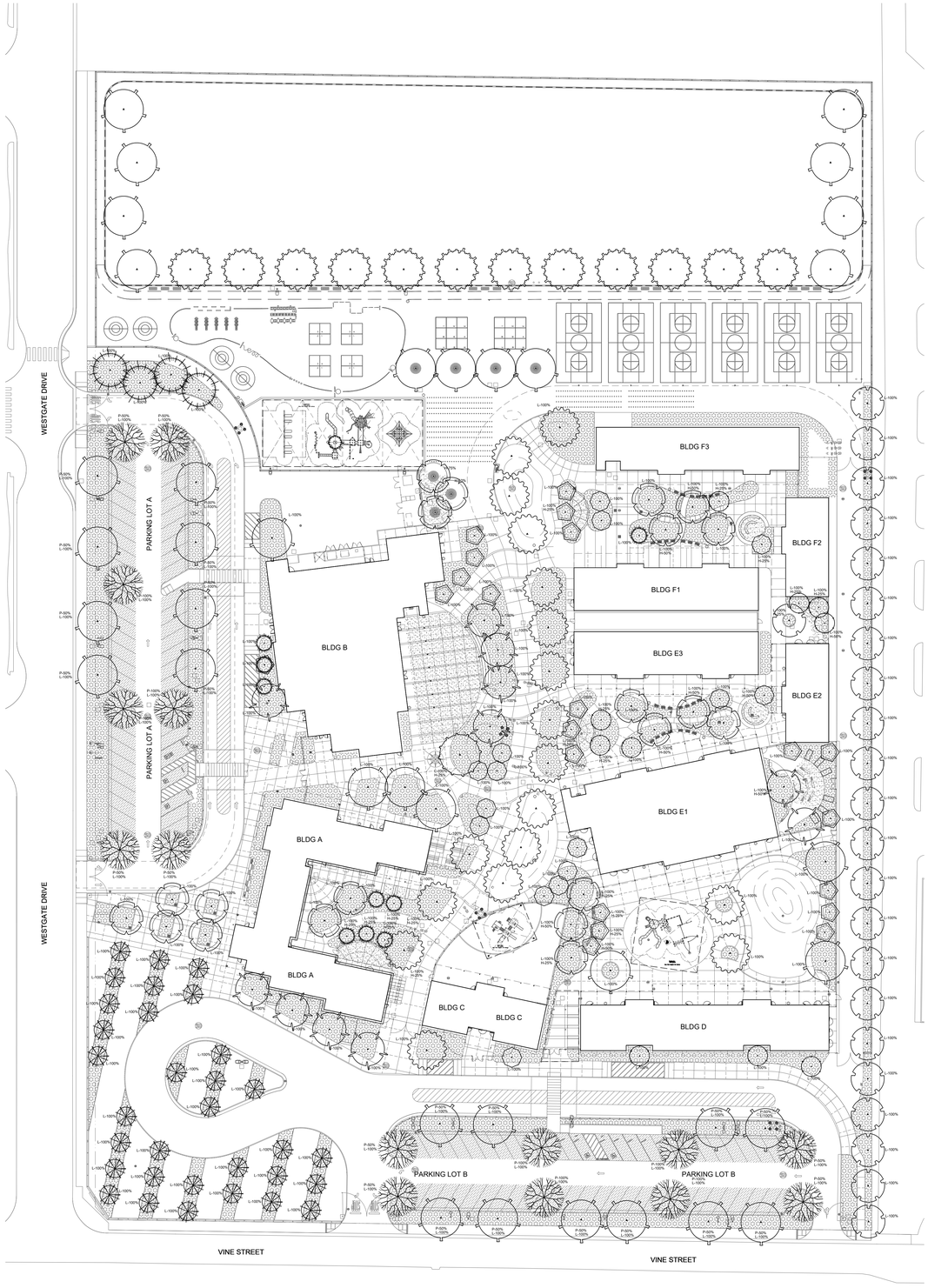
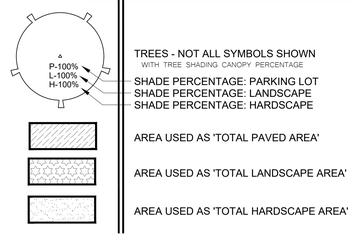


KEY — TREE SHADING LEGEND



PARKING LOT A SHADING (50% WITHIN 20 YEARS)

TREES	100%	50%
30'	3 (707) = 2121 S.F.	12 (354) = 4248 S.F.
SUB-TOTALS	2121 S.F.	4248 S.F.

TOTAL PAVED AREA = 10,592 S.F.
TOTAL SHADED AREA = 6,369 S.F.
PERCENTAGE OF SHADE = 60.0%

PARKING LOT B SHADING (50% WITHIN 20 YEARS)

TREES	100%	50%
30'	4 (707) = 2828 S.F.	14 (354) = 4956 S.F.
SUB-TOTALS	2828 S.F.	4956 S.F.

TOTAL PAVED AREA = 10,478 S.F.
TOTAL SHADED AREA = 7,784 S.F.
PERCENTAGE OF SHADE = 74.0%

LANDSCAPE SHADING (20% WITHIN 15 YEARS)

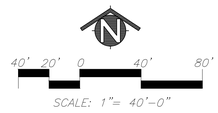
TREES	100%
30'	58 (707) = 41,006 S.F.
25'	55 (491) = 27,005 S.F.
20'	87 (314) = 27,318 S.F.
SUB-TOTALS	0000 S.F.

TOTAL LANDSCAPE AREA = 68,638 S.F.
TOTAL SHADED AREA = 95,329 S.F.
PERCENTAGE OF SHADE = 139.0%

HARDSCAPE SHADING (20% WITHIN 15 YEARS)

TREES	100%	75%	50%	25%
30'				3 (177) = 531 S.F.
25'			6 (246) = 1476 S.F.	2 (123) = 246 S.F.
20'	1 (314) = 314 S.F.	1 (236) = 236 S.F.	4 (157) = 628 S.F.	15 (79) = 1185 S.F.
SUB-TOTALS	314 S.F.	236 S.F.	2104 S.F.	1962 S.F.

TOTAL HARDSCAPE AREA = 8,227 S.F.
TOTAL SHADED AREA = 4,616 S.F.
PERCENTAGE OF SHADE = 56.0%



AGENCY APPROVAL:

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PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
TREE SHADING PLAN

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THE LINE BROWN ABOVE IS EXACTLY 1" LONG WHEN PLOTS ON 24x36 ORIGINAL MADE SIZE

CONCRETE FORMWORK AND ACCESSORIES NOTES:

1. FORM MATERIALS MAY BE PLYWOOD PER APA DOC PS-1, CLASS 1 EXTERIOR GRADE, OR DOUGLAS FIR LUMBER, CONSTRUCTION GRADE MINIMUM.
2. FORM RELEASE AGENTS SHALL BE OF A LIQUID CHEMICAL AGENT FREE OF WAX OR OILS AND SHALL BE COLORLESS AND NON-STAINING, AND IN COMPLIANCE WITH LOCAL AQMD. FORM RELEASE AGENTS TO BE APPLIED PRIOR TO PLACEMENT OF REINFORCING AND ALL EMBEDDED ITEMS.
3. FORMWORK IS TO BE ERECTED PER ACI 318 SECTION 26.11 AND IS TO MAINTAIN TOLERANCES REQUIRED BY ACI 117. FORMWORK IS TO BE PER 1/50.02, TYP UNO. NON-PLYWOOD FORMWORK SHALL BE THOROUGHLY WATER SOAKED AT LEAST 12 HOURS BEFORE PLACING CONCRETE.
4. REMOVAL OF FORMWORK IS TO BE PER ACI 318 SECTION 26.11.
5. SPACERS AND CHAIRS FOR REINFORCING AT SLABS ON GRADE ARE TO BE MANUFACTURED FROM NON-FERROUS MATERIAL/PLASTIC. CONCRETE DOBIES MY BE USED AT FOOTINGS ONLY
6. ALL DEBRIS SHALL BE REMOVED FROM FORMS AND FOOTING EXCAVATIONS PRIOR TO POURING CONCRETE. NO WOOD STAKES OR FORM SPREADERS SHALL BE PERMITTED IN CONCRETE.

CONCRETE REINFORCING NOTES:

1. ALL CONCRETE REINFORCING SHALL CONFORM TO THE 2022 CBC AND BE DETAILED, FABRICATED, AND PLACED PER ACI 318-19, AND PER THE LATEST EDITION OF ACI 315.
2. SUBMITTALS:
   - A. SHOP DRAWINGS - DRAWINGS INDICATING BAR SIZES, SPACING, LOCATIONS, QUANTITIES, AND BEND/DETAILING PROVISIONS.
   - B. PRODUCT DATA - SPACING AND SUPPORTING DEVISES INCLUDING CHAIRS.
3. REINFORCEMENT SHALL CONFORM TO ASTM A706 GRADE 60 OR ASTM A615 GRADE 60. ASTM A615 GRADE 60 REQUIRES 80,000 PSI MINIMUM TENSILE STRENGTH WITH 1.10 MINIMUM RATIO OF ACTUAL TENSILE STRENGTH TO ACTUAL YIELD STRENGTH BASED ON MILL TESTING. ALL REINFORCEMENT TO BE WELDED SHALL BE ASTM A-706, GRADE 60 (SEE NOTE 10 BELOW).
4. ALL BENDING OF REINFORCEMENT IS TO BE PER ACI AND PER 3/50.02. FIELD BENDING OF REINFORCEMENT SHALL NOT BE PERMITTED.
5. REINFORCEMENT IN SLABS AND FOOTINGS SHALL BE CONTINUOUS AROUND CORNERS OR CORNER BARS PROVIDED.
6. LAP SPLICES OF CONCRETE REINFORCEMENT, UNO
   - A. #3 BARS = 30"
   - B. #4 BARS = 40"
   - C. #5 BARS = 50"
   - D. #6 BARS = 60"

   NOTED LAP LENGTHS ARE BASED ON CONCRETE WITH A 28-DAY STRENGTH OF 3,500 PSI, NON-EPOXY COATED BARS, AND CLASS B LAP SPLICES.
7. ALL ADJACENT REINFORCING LAPS ARE TO BE STAGGERED A MINIMUM OF 5'-0".
8. REINFORCING SHALL BE PLACED WITH THE FOLLOWING MINIMUM CLEAR COVERAGE, UNO:
   - A. POURED AGAINST EXCAVATIONS/GROUND = 3"
   - B. POURED AGAINST FORMS, EXPOSED TO SOIL = 2"
   - C. CONCRETE EXPOSED TO WEATHER = 1½"
   - D. SLABS ON GRADE - CENTER REINFORCING WITHIN SLAB DEPTH
9. REINFORCING SHALL BE TIED IN PLACE. TACK WELDING OF REINFORCING IS NOT PERMITTED.
10. WHERE REINFORCING IS NOT SPECIFIED, REFER TO ACI 318 FOR MINIMUM REINFORCEMENT.
11. WELDING OF REINFORCING IS NOT PERMITTED UNLESS SHOWN ON THESE DRAWINGS OR WITH PRIOR WRITTEN APPROVAL FROM THE SEOR.

CAST-IN-PLACE CONCRETE NOTES:

1. ALL CONCRETE CONSTRUCTION SHALL CONFORM TO THE 2022 CBC AND ACI 318-19.
2. SUBMITTALS:
   - A. PRODUCT DATA - CONCRETE RELATED PRODUCTS INCLUDING BUT NOT LIMITED TO BONDING AGENT, NON-SHRINK GROUT, CURING COMPOUND, PROPOSED ADMIXTURES, ETC.
   - B. MIX DESIGNS - SUBMIT ALL PROPOSED MIX DESIGNS AS PREPARED BY CONCRETE SUPPLIER TO AOR/SEOR FOR REVIEW AND FOR ACCEPTANCE BY A THE TESTING LAB OF RECORD (TLOR) FOR THE PROJECT. MIX DESIGNS TO INCLUDE HISTORICAL TEST DATA OF 28-DAY BREAKS (30 MIN).
3. ALL CONCRETE SHALL BE NORMAL WEIGHT PER ACI 301 AND HAVE PROPORTIONS OF CEMENT, COARSE AND FINE AGGREGATE, WATER AND ADMIXTURES TO PRODUCE THE PROPERTIES SPECIFIED FOR EACH CONCRETE MIX TYPE PER ACI 301 ON THE BASIS OF PREVIOUS FIELD EXPERIENCE AND SUPPORTED BY PREVIOUS TEST RECORDS.
4. STRUCTURAL CONCRETE SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES.

   FOR USE AT FOUNDATIONS
   - A. 28-DAY STRENGTH, F'c = 4,000 PSI
   - B. MAX AGGREGATE SIZE = 1"
   - C. MAX WATER TO CEMENT RATIO = 0.55
   - D. SLUMP = 4" ± 1" PER ASTM C-143
   - E. ADMIXTURES CONTAINING CALCIUM CHLORIDE ARE NOT ALLOWED

   FOR USE AT SLABS ON GRADE
   - A. 28-DAY STRENGTH, F'c = 4,000 PSI
   - B. MAX AGGREGATE SIZE = 1"
   - C. MAX WATER TO CEMENT RATIO = 0.45
   - D. SLUMP = 3" ± 1" PER ASTM C-143
   - E. ADMIXTURES CONTAINING CALCIUM CHLORIDE ARE NOT ALLOWED
5. CONSTITUENTS OF STRUCTURAL CONCRETE SHALL MEET THE FOLLOWING REQUIREMENTS:
   - A. PORTLAND CEMENT PER ASTM C-150 TYPE V - THE AMOUNT OF POZZOLAN OR SLAG CEMENT SHALL BE AT LEAST THE AMOUNT THAT HAS BEEN DETERMINED BY SERVICE RECORD TO IMPROVE SULFATE RESISTANCE PER ACI 318-19, TABLE 19.3.2.1, FOOTNOTE 7.
   - B. COARSE AND FINE AGGREGATES PER ASTM C-33.
   - C. REINFORCING PER ASTM A615 GRADE 60, UNO.
   - D. FLY ASH PER ASTM C-618 CLASS N OR F (15% MAX BY WEIGHT).
   - E. WATER SHALL BE PER ASTM C-1602 AND SHALL BE CLEAN AND FREE OF DELETERIOUS AMOUNTS OF ACID, ALKALIS, SALTS AND ORGANIC MATTER.
6. MIX AND DELIVER CONCRETE PER ACI 318 SECTIONS 26.4 AND 26.5 IN TRANSIT MIXERS ONLY (READY-MIXED CONCRETE). READY-MIXED CONCRETE IS TO BE PER ASTM C-94. A DELIVERY TICKET SHALL BE PROVIDED FOR EACH LOAD OF READY-MIXED CONCRETE, WITH A COPY GIVEN TO THE JOB SITE SUPERINTENDENT AND A COPY PROVIDED TO THE AOR/SEOR.
7. ALL REINFORCEMENT, ANCHOR BOLTS, AND OTHER EMBEDDED ITEMS SHALL BE SECURED IN POSITION SHOWN ON DRAWINGS PRIOR TO PLACING CONCRETE.
8. SLABS ON GRADE SHALL BE PLACED OVER A 5" LAYER OF CLEAN CRUSHED ROCK, 1" MAX SIZE, WITH NO MATERIAL PASSING THROUGH A NO. 4 SIEVE. A VAPOR BARRIER IS TO BE PLACED OVER THE LAYER OF GRAVEL, DIRECTLY UNDER THE SLAB. VAPOR BARRIER IS TO BE STEGO WRAP, BY STEGO INDUSTRIES, 15 MIL SYSTEM AND A CLASS A RATING AND A PERM RATING NOT TO EXCEED 0.01 PERMS.
9. FREE-FALL OF CONCRETE SHALL BE LIMITED TO 4'-0" MAX. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL SO AS TO CAUSE SEPARATION OF AGGREGATES.
10. CONCRETE SHALL BE CONSOLIDATED BY MECHANICAL VIBRATION PER ACI 309 BY MEANS SUITABLE FOR ON SITE CONDITIONS. USE HAND RODDING OR TAMPING AS REQUIRED.

CAST-IN-PLACE CONCRETE NOTES (CONTINUED):

11. CONSTRUCTION JOINTS SHALL HAVE ALL LOOSE MATERIAL REMOVED AND SHALL BE INTENTIONALLY ROUGHENED TO ¼" AMPLITUDE PRIOR TO POURING CONCRETE. CONTRACTOR SHALL SUBMIT CONSTRUCTION JOINT LOCATIONS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
12. REFER TO ACI RECOMMENDATIONS FOR PLACING AND CURING CONCRETE IN COLD (SECTION 26.5.4) AND HOT (SECTION 26.5.5) WEATHER CONDITIONS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING CONCRETE MIX DESIGN WITH BATCH PLANT TO PROVIDE CONCRETE MIX APPROPRIATE FOR SITE CONDITIONS. NO CONCRETE PLACEMENT SHALL OCCUR AT TEMPERATURES BELOW 50° FAHRENHEIT NOR ABOVE 90° FAHRENHEIT.
13. CONTRACTOR IS RESPONSIBLE FOR DETERMINING AND IMPLEMENTING APPROPRIATE CURING PROCEDURES FOR ACTUAL SITE/WEATHER CONDITIONS AND SHALL INCLUDE PROVISIONS FOR INCLEMENT WEATHER. REFER TO ACI 308R.
14. ALL SLABS SHALL BE FLAT AND LEVEL WITH A TOLERANCE OF $\frac{3}{4}$" IN 10' FOR FLATNESS AND MINIMUM LOCAL VALUE F = 32 PER ASTM 1155. THE PROJECT OWNER MAY REJECT ANY CONSTRUCTION THAT DOES NOT MEET THE FLATNESS CRITERIA NOTED WITH REPLACEMENT AT CONTRACTOR'S EXPENSE.
15. CONDUITS AND PIPES EMBEDDED IN THE SLAB (OTHER THAN THOSE PASSING VERTICALLY THROUGH) SHALL NOT BE PERMITTED. CONTRACTOR TO SUBMIT FOOTING PENETRATIONS TO STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
16. BONDING AGENT TO BE PER ASTM C-631, BONDCRETE-S BY BURKE, LOCK BOND NO. 906 BY LAMBERT CORPORATION, OR APPROVED EQUAL.
17. NON-SHRINK GROUT TO BE PER ASTM C-1107, SIKA-328 BY SIKA CORPORATION OR EQUAL, AND SHALL REACH A MINIMUM STRENGTH OF 5,000 PSI WITHIN 7 DAYS.
18. THE STRUCTURAL ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR A MINIMUM OF 48 HOURS BEFORE PLACING CONCRETE.

STRUCTURAL STEEL NOTES:

1. THE FABRICATION AND ERECTION OF ALL STEEL CONSTRUCTION SHALL CONFORM TO THE 2022 CBC AND THE AISC STEEL CONSTRUCTION MANUAL 16th EDITION.
2. SUBMITTALS:
   - A. SHOP DRAWINGS - DRAWINGS INDICATING MEMBER SIZES/PROFILES, LOCATIONS, AND CONNECTIONS, BOTH WELDED AND BOLTED.
   - B. PRODUCT DATA - MILL TEST REPORTS/PRODUCT DATA FOR STEEL MEMBERS, BOLTS, AND WELDING ELECTRODES.
   - C. WELDING CERTIFICATES AND PROCEDURES - WELDER'S CERTIFICATES TO CERTIFY THAT WELDERS PERFORMING THE WORK MEET AWS QUALIFICATIONS WITH THE PREVIOUS 12 MONTHS AND WELDING PROCEDURES FOR EACH WELD TYPE REQUIRE ON PROJECT TO BE SUBMITTED FOR ACCEPTANCE BY TESTING LAB OF RECORD (TLOR).
3. STRUCTURAL STEEL SHAPES SHALL CONFORM TO THE FOLLOWING
   - A. ANGLES — ASTM A36, Fy = 36 KSI
   - B. PLATES — ASTM A36/A572, Fy = 50 KSI (DUAL CERT)
   - C. SQUARE/RECTANGULAR HSS — ASTM A500, GRADE C Fy = 50 KSI
4. WELDING SHALL BE BY THE ELECTRIC ARC PROCESS (SHIELDED METAL ARC WELDING, FLUX CORE ARC WELDING, GAS METAL ARC WELDING) PER AWS STANDARDS AND BY CERTIFIED WELDERS. REFER TO "QUALIFICATION PROCEDURE" AWS D1.1.
5. ALL WELDED JOINTS AND ELECTRODES ARE TO BE "PREQUALIFIED." ALL WELDING ELECTRODES ARE TO BE E70XX UNO. FCAW FILLER METAL WIRE SHALL BE $\frac{5}{64}$" MAX DIAMETER AND SMAW FILLER METAL WIRE SHALL BE $\frac{3}{32}$" MAX DIAMETER.
6. ALL STRUCTURAL STEEL SHALL BE ERECTED PLUM AND TRUE TO LINE. TEMPORARY BRACING SHALL BE INSTALLED AS REQUIRED TO MAINTAIN STABILITY OF THE STRUCTURE UNTIL THE STRUCTURAL SYSTEM IS SUBSTANTIALLY COMPLETE.
7. ALL STRUCTURAL STEEL ITEMS EMBEDDED IN CONCRETE AND LOCATED BELOW GRADE SHALL HAVE 3" MINIMUM COVER. ALL STRUCTURAL STEEL ITEMS EMBEDDED IN CONCRETE AND LOCATED ABOVE GRADE AT CONCRETE EXPOSED TO WEATHER SHALL HAVE 1½" MINIMUM COVER.
8. ALL STEEL BOLTS ARE TO HAVE STANDARD GAGE AND PITCH PER AISC. ALL STEEL-TO-STEEL BOLTED CONNECTIONS SHALL BE WITH A325-N BOLTS, INSTALLED 'SNUG TIGHT' PER AISC, UNO WITH GRADE C NUTS PER ASTM A-563. ALL EMBEDDED ANCHOR BOLTS SHALL BE F1554 GRADE 36 UNO. HOLES AT STEEL-TO-STEEL CONNECTIONS ARE TO BE $\frac{1}{16}$" OVERSIZE AND HOLES AT STEEL COLUMN BASE PLATES ARE TO BE $\frac{1}{8}$" OVERSIZE, UNO.
9. STRUCTURAL STEEL IS TO BE SHOP PRIMED WITH ONE COAT, EXCEPT THE BELOW NOTED LOCATIONS, WHERE PRIMER SHALL BE HELD 2" CLEAR:
   - A. STEEL SURFACES EMBEDDED IN CONCRETE
   - B. SURFACES TO BE FIELD WELDED
   - C. CONTACT SURFACES WITH HIGH STRENGTH BOLTED CONNECTIONS
10. ALL STRUCTURAL COLUMNS ARE TO BE SET UPON ANCHOR RODS WITH LEVELING NUTS ALLOWING APPROXIMATELY 1½" ± CLEARANCE. CLEARANCE SPACE UNDER COLUMNS AND BLOCK-OUTS IN CURBS FOR COLUMN PLACEMENT ARE TO BE FILLED WITH A NON-SHRINK, HIGH-STRENGTH, POURABLE GROUT.

CONCRETE MASONRY NOTES:

1. ALL CONCRETE MASONRY UNITS SHALL BE MEDIUM WEIGHT PER ASTM C90 WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH = 2,000 PSI. USE OPEN END UNITS AS REQUIRED TO MAINTAIN REINFORCEMENT CLEARANCES AND PROPERLY CONSOLIDATE GROUT. ALL CELLS TO BE SOLID GROUTED. UNITS TO BE SAMPLED AND TESTED TO VERIFY CONFORMANCE WITH ASTM C90.
2. GROUT SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH = 2000 PSI AND HAVE MINIMUM 6 SACKS OF CEMENT/CU YD. ADD ONE POUND SIKA GROUT AID PER 100 LB OF CEMENT. GROUT SHALL CONFORM WITH TMS 402/602 & ASTM C476
3. MORTAR SHALL BE TYPE S IN ACCORDANCE WITH TMS 402/602 & ASTM C270 WITH A MINIMUM 28-DAY STRENGTH OF 1800 PSI.
4. LAP ALL REINFORCEMENT 80 BAR DIAMETERS UNLESS NOTED OTHERWISE. WHERE LAPS OF ADJACENT BARS ARE SPACED 3" OR LESS, INCREASE LAP LENGTH 30%.
5. ALL REINFORCEMENT TO BE TIED AND SECURED IN PLACE PRIOR TO GROUTING.
6. GROUT POURS ARE TO BE PER 2022 CBC 2104A.1.3.5 AND GROUT LIFTS ARE TO BE PER 2104A.1.3.6. SEE PROJECT SPECIFICATIONS.
7. PROVIDE INVERTED BOND UNIT AT BOTTOM OF ALL LIFTS AS REQUIRED TO FACILITATE PLACEMENT OF CLEAN OUTS.
8. FOOTING DOWELS WITH STANDARD HOOK SHALL MATCH SIZE AND SPACING OF VERTICAL REINFORCEMENT UNO. PROVIDE MINIMUM LAP W/ VERTICAL REINFORCEMENT AND EXTEND HOOKED END TO WITHIN 3" OF BOTTOM OF FOOTING UNO.
9. PROVIDE 2-#5 CONT IN BOND BEAM UNITS AT THE TOPS OF WALLS AND AT ALL ROOF LEDGER LOCATIONS
10. PROVIDE TEMPLATES AS REQUIRED TO SECURE BOLTS IN POSITION. PROVIDE 1" MIN GROUT AROUND BOLTS.
11. PROVIDE TEST AND INSPECTIONS IN COMPLIANCE WITH TMS 402/602 FOR LEVEL 2 QUALITY ASSURANCE.

GENERAL NOTES:

1. ALL NEW WORK SHALL CONFORM TO TITLE 24 2022 EDITIONS WITH AMENDMENTS AND ALL OTHER APPLICABLE CODES AND REGULATIONS.
2. THIS SET OF STRUCTURAL DRAWINGS IS APPLICABLE ONLY FOR THE SITE NOTED IN 'ITEM 1' OF THE 'DESIGN CRITERIA' ON THIS SHEET.
3. NOTES ON THIS SHEET ARE TYPICAL AND SHALL APPLY UNLESS OTHERWISE NOTED OR SHOWN. TYPICAL DETAILS SHALL APPLY FOR ALL LIKE CONDITIONS UNLESS OTHERWISE NOTED OR DETAILED.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS, ELEVATIONS, EXISTING CONDITIONS, AND OTHER RELATED ITEMS. THE CONTRACTOR SHALL REVIEW THE CONTRACT DOCUMENTS PRIOR TO CONSTRUCTION AND SHALL NOTIFY THE ENGINEER OF RECORD IF ANY CONFLICTS ARE SHOWN OR NOTED.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFORM TO RELEVANT SECTIONS OF THE CALIFORNIA "CONSTRUCTION SAFETY ORDERS" AND ALL OSHA REQUIREMENTS. THE ENGINEER OF RECORD ACCEPTS NO RESPONSIBILITY FOR THE CONTRACTOR'S FAILURE TO COMPLY W/ THESE REQUIREMENTS.
6. STRUCTURAL DRAWINGS REPRESENT THE FINISHED STRUCTURE, AND DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. DESIGN AND CONSTRUCTION OF ALL TEMPORARY BRACING, SHORING, FORMING, ETC REQUIRED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. A COPY OF TITLE 24 CCR PARTS 1 -5 SHALL BE KEPT ON SITE AT ALL TIMES (T-24 PART 1, 4-317(c).
8. ALL CHANGES TO THE ACCESSIBILITY, FIRE AND LIFE SAFETY, AND STRUCTURAL PORTIONS OF THE APPROVED DRAWINGS SHALL BE MADE BY A CONSTRUCTION CHANGE DOCUMENT (CCD). ALL SUCH CHANGES BY CCD ARE TO BE SIGNED BY THE SEOR, THE OWNER, AND APPROVED BY DSA. CHANGES BY CCD ARE NOT VALID UNTIL APPROVED BY DSA (T-24, PART 1, 4-338 AND DSA IR A-6).
9. A PROJECT INSPECTOR (INSPECTOR OF RECORD, IOR) EMPLOYED BY THE OWNER/DISTRICT AND CERTIFIED BY DSA SHALL PROVIDE CONTINUOUS INSPECTION OF THE WORK. INSPECTOR TO BE CLASS 1 PER IR A-7.
10. THE STRUCTURAL ENGINEER SHALL PERFORM DUTIES PER T-24 PART 1, 4-333(a) AND 4-341. THE CONTRACTOR SHALL PERFORM DUTIES PER 4-343. THE IOR SHALL PERFORM DUTIES PER T-24 PART 1, 4-342.

INSPECTION NOTES:

1. ALL TESTS AND INSPECTIONS ARE TO BE PROVIDED BY A QUALIFIED TESTING LAB OF RECORD, HIRED BY THE DISTRICT (T-24 PART 1, 4-335).
2. ALL TESTS AND INSPECTIONS SHALL CONFORM TO CHAPTER 17A OF THE 2022 CBC AND THE PROJECT SPECIFIC DSA-103.

FOUNDATION NOTES:

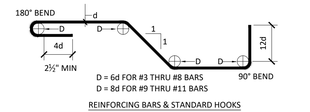
1. FOUNDATIONS ARE DESIGNED ACCORDING TO SECTION 5 OF THE DESIGN CRITERIA ON THIS SHEET.
2. FOOTINGS SHALL BEAR ON FIRM, DRY, COMPACTED SOIL.
3. FOOTING DEPTHS INDICATED ON PLANS ARE MINIMUMS. AREAS OF OVER-EXCAVATION SHALL BE BACKFILLED WITH COMPACTED FILL PER THE SOILS REPORT OR WITH LEAN CONCRETE HAVING A MINIMUM 28-DAY STRENGTH OF 1,000 PSI.
4. FOOTINGS MAY BE OVER-EXCAVATED AT CONTRACTOR'S OPTION FOR PLACEMENT OF LEAN MIX CONCRETE TO FACILITATE THE REMOVAL OF DEBRIS AND STANDING WATER.
5. ALL FOOTINGS NOT FORMED SHALL BE POURED IN NEAT EXCAVATIONS. BOTTOMS OF EXCAVATIONS SHALL BE LEVEL, WITH CHANGES IN ELEVATION ONLY AS NOTED IN THESE DRAWINGS.
6. SEOR SHALL BE NOTIFIED IMMEDIATELY WHERE JOB SITE CONDITIONS ARE DIFFERENT THAN THOSE SHOWN ON CONTRACT DRAWINGS.
7. SEOR SHALL BE NOTIFIED A MINIMUM OF 48-HOURS PRIOR TO THE PLACING OF CONCRETE SLABS AND FOUNDATIONS.
8. FOUNDATIONS ARE TO AS INDICATED ON THE FOUNDATION PLAN AND REFERENCED DETAILS.

POST INSTALLED ANCHOR NOTES:

1. ALL POST INSTALLED ANCHORS ARE TO BE INSTALLED PER MANUFACTURER FOR EACH ANCHOR AND PER THE ICC REPORTS LISTED BELOW.
2. ALL POST-INSTALLED ANCHORS ARE TO BE CAREFULLY INSTALLED SO AS TO NOT DISTURB OR DAMAGE THE STEEL REINFORCING IN ANY WAY. ANCHORS MAY NOT BE INSTALLED UNTIL CONCRETE OR GROUT HAS REACHED A MINIMUM AGE OF 28 DAYS.
3. ALL HOLES FOR DRILLED-IN ANCHORS SHALL BE COMPLETELY DRY AND WELL CLEANED WITH A BOTTLE BRUSH AND COMPRESSED AIR PRIOR TO INSTALLING THE ANCHORS.
4. ALL DRILLED-IN ANCHORS SHALL BE TESTED PER CHAPTER 1910A OF THE 2022 CBC AND PER THE DSA-103. ALL TESTING SHALL BE DONE BY THE TESTING LABORATORY OF RECORD AND SHALL BE PERFORMED IN THE PRESENCE OF A SPECIAL INSPECTOR. ALL TESTING RESULTS SHALL BE SUBMITTED TO DSA AND TO THE ARCHITECT AND STRUCTURAL ENGINEER. TESTING SHALL OCCUR WITHIN 24 HOURS OF THE INSTALLATION OF EACH ANCHOR.
5. POST-INSTALLED ANCHORS ARE TO BE AS FOLLOWS:
   - A. EXPANSION ANCHORS IN CONCRETE — HILTI KB TZ2 PER ICC-ES ESR-4266
   - B. EXPANSION ANCHORS IN FULLY GROUTED CMU — HILTI KB TZ2 PER ICC-ES ESR-4561
   - B. EPOXY ANCHORS IN CONCRETE — HILTI HIT-HY 200 V3 PER ICC-ES ESR-4868
6. POST-INSTALLED ANCHORS ARE TO BE INSTALLED ONLY WHERE SPECIFICALLY DETAILED, WITH EMBEDMENTS AS SPECIFICALLY IDENTIFIED IN EACH APPLICABLE DETAIL. FOR ADDITIONAL INFORMATION FOR EXPANSION ANCHORS, SEE TABLE BELOW.
7. POST-INSTALLED ANCHORS MAY NOT BE USED AT LOCATIONS OTHER THAN THOSE SPECIFICALLY DETAILED IN THE PROJECT DRAWINGS WITHOUT PRIOR WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD.

CONCRETE: HILTI KWIK BOLT TZ2 EXPANSION ANCHORS - SEE ICC ESR-4266 TABLE 1

ANCHOR DIAMETER	$\frac{3}{8}$"Ø	$\frac{1}{2}$"Ø	$\frac{5}{8}$"Ø
BIT DIAMETER	$\frac{3}{8}$"Ø	$\frac{1}{2}$"Ø	$\frac{5}{8}$"Ø
NOMINAL EMBEDMENT	2$\frac{1}{2}$"	2$\frac{1}{2}$"	4$\frac{1}{2}$"
HOLE DEPTH	2$\frac{1}{2}$"	2$\frac{1}{2}$"	4$\frac{1}{2}$"
TORQUE (STAINLESS STEEL)	30 FT-LB	40 FT-LB	60 FT-LB
TORQUE (CARBON STEEL)	30 FT-LB	50 FT-LB	40 FT-LB



D = 6d FOR #3 THRU #8 BARS
D = 8d FOR #9 THRU #11 BARS

REINFORCING BARS & STANDARD HOOKS

NOTES:

1. THE ABOVE DETAILS ARE PROVIDED TO SPECIFY STAND REBAR BENDS AND BEND EXTENSIONS, TYP UNO.
2. ALL REBAR PLACEMENT IS TO BE AS SHOWN IN PROJECT DETAILS. SEE 'CONCRETE REINFORCING NOTES'.
3. NOT ALL CONDITIONS SHOWN ABOVE WILL APPLY TO THIS PROJECT.

STANDARD REBAR BENDS — 1

STRUCTURAL SHEET INDEX:

S0.01 TYPICAL STRUCTURAL NOTES
S1.01 CMU TRASH ENCLOSURE PLANS, ELEVATIONS & DETAILS

DESIGN CRITERIA:

1. PROJECT ADDRESS: 2801 WEST VINE STREET, LODI, CA 95242
2. BUILDING CODE: 2022 CALIFORNIA BUILDING CODE
3. GRAVITY LOADS:
   WALL WEIGHTS — CMU WALLS = 80 PSF
4. LATERAL LOADS: RISK CATEGORY II

   WIND LOADS (ASCE 7-16)
   - BASIC WIND SPEED: 93 MPH (71 MPH ASD)
   - EXPOSURE: C

   PRESSURE COEFFICIENTS
   - INTERNAL PRESSURE COEFFICIENT, GC_{pi} = ±0.18
   - TOPOGRAPHIC FACTOR, K_{zt} = 1.00
   - WIND DIRECTIONALITY FACTOR, K_d = 0.85

   VELOCITY PRESSURES
   - q (0'-15') = 9.6 PSF (ASD)
   - q (15'-20') = 10.2 PSF (ASD)

   SEISMIC LOADS (ASCE 7-16)
   - SITE CLASS: D
   - SEISMIC DESIGN CATEGORY: D
   - IMPORTANCE FACTOR: 1.00
   - S_1 = 0.643, S_s = 0.264
   - F_v = 1.285, F_a = 2.072
   - S_{M1} = 0.827, S_{MS} = 0.821
   - S_{D1} = 0.551, S_{DS} = 0.547

   GROUND SUPPORTED CANTILEVERED WALLS (ASCE 7-16 TABLE 15.4-2)
   - R = 1.25, $C_s = \frac{S_{DS}}{(R / I)}$
   - Ω_0 = 2.0
   - C_s = 2.50 = 0.245
   - ρ = 1.0 V(ASD) = 0.7 x ρ x C_s x W = 0.223 x W
5. GEOTECHNICAL CRITERIA:
   GEOTECHNICAL AND GEOHAZARDS REPORT BY MID PACIFIC ENGINEERING, REPORT NO. 07246-01, DATED SEPTEMBER 8, 2025.
   - ALLOWABLE BEARING PRESSURE (D+L) = 2,500 PSF
   - (INCLUDING W OR E) = 3,300 PSF
   - PASSIVE PRESSURE = 150 PCF
   - (HALF INCH DEFLECTION ALLOWED AT SURFACE) 300 PCF
   - (⅓ INCREASED ALLOWED FOR SHORT TERM LOADS) 400 PCF

ABBREVIATIONS:

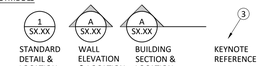
@	AT
AB	ANCHOR BOLT
ACI	AMERICAN CONCRETE INSTITUTE
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
ARCH	ARCHITECT/ARCHITECTURAL
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
B.O.	BOTTOM OF
C	CHANNEL
CBC	CALIFORNIA BUILDING CODE
CL	CENTERLINE
cc	CENTER TO CENTER
CFS	COLD-FORMED STEEL
CONT	CONTINUOUS
Ø	DIAMETER
DWGS	DRAWINGS
DSA	DIVISION OF THE STATE ARCHITECT
F.O.	FACE OF
HSS	HOLLOW STRUCTURAL SECTION
L	STEEL ANGLE
MAX	MAXIMUM
MIN	MINIMUM
NTS	NOT TO SCALE
#	NUMBER OR POUNDS
OH	OPPOSITE HAND
PAF	POWDER-ACTUATED FASTENER
PL	PLATE
SEOR	STRUCTURAL ENGINEER OF RECORD
SMS	SHEET METAL SCREW
T & B	TOP AND BOTTOM
THRU	THROUGH
T.O.	TOP OF
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
W	WIDE FLANGE
w/	WITH

DRAWING STANDARDS:

SHEET NUMBERING
- STRUCTURAL SHEETS
- DRAWING TYPE
  - 0 TYPICAL NOTES & DETAILS
  - 2 FOUNDATION & ROOF FRAMING PLANS
  - 3 SECTIONS & ELEVATIONS
  - 4 DETAILS
- SHEET NUMBER WITHIN ABOVE DESIGNATIONS

S2.01

SYMBOLS



STANDARD DETAIL & LOCATION | WALL ELEVATION & LOCATION | BUILDING SECTION & LOCATION | KEYNOTE REFERENCE

STRUCTURAL ELEVATION

GRID LINE @ CENTER OF WALL — A

MATERIAL LEGEND

ENGINEERED FILL | STRUCTURAL CONCRETE | GRAVEL FILL

PLEASE RECYCLE

AGENCY APPROVAL:

LODI USD

HMC DESIGN FOR GOOD Architects
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

ISSUE

Δ	DESCRIPTION	DATE

RW CONSULTING Engineers Inc
1450 HARBOR BLVD SUITE F
WEST SACRAMENTO, CA 95691
916.716.6910

REGISTERED PROFESSIONAL ENGINEER — GREGORY T. REYNOLDS — STRUCTURAL — STATE OF CALIFORNIA

12/8/2025

FACILITY:

SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:

SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:

TYPICAL STRUCTURAL NOTES

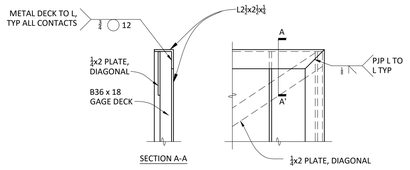
DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO.: **3431-010-000**

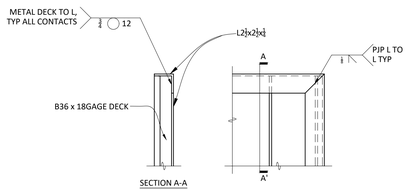
SHEET:

S0.01

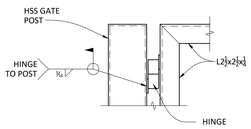
THE LINE SHOWN ABOVE IS EXACTLY 1" LONG ON ANSI D SHEETS ORIGINAL SCALE: 1/2"



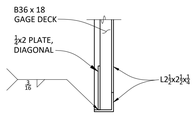
GATE DETAIL 6
1½" = 1'-0"



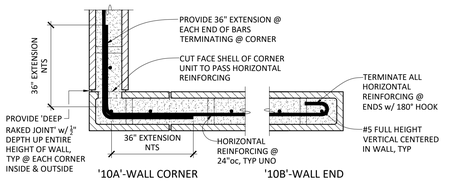
GATE DETAIL 7
1½" = 1'-0"

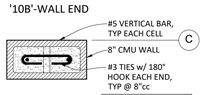


GATE DETAIL 8
1½" = 1'-0"



GATE DETAIL 9
1½" = 1'-0"



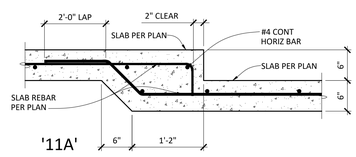


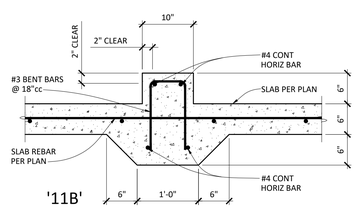
NOTE: ROTATE HOOKS OUT OF HORIZONTAL PLANE TO FIT IN WALL

NOTES:

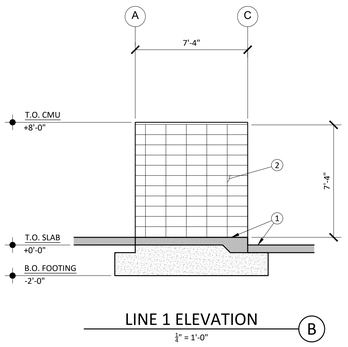
1. CMU WALLS ARE FULLY GROUTED.
2. DETAIL '10A' APPLIES AT ALL CORNERS. DETAIL '10B' APPLIES AT ALL WALL ENDS.
2. PROVIDE FLEXIBLE SEALANT (SIKA FLEX OR EQUAL) @ RAKED JOINTS.

TYPICAL CMU WALL REINFORCING
1" = 1'-0"
10

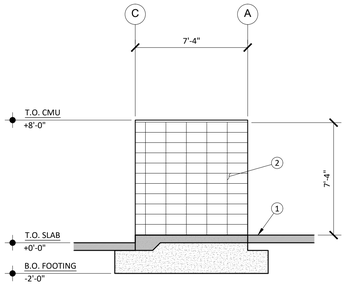




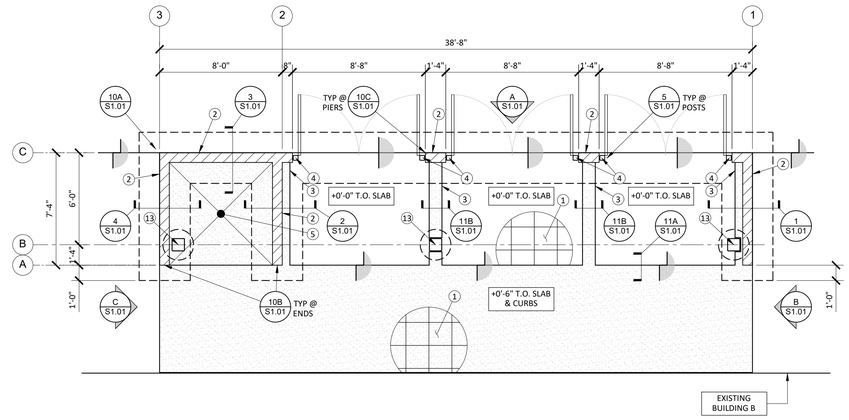
SLAB STEP
1" = 1'-0"
11



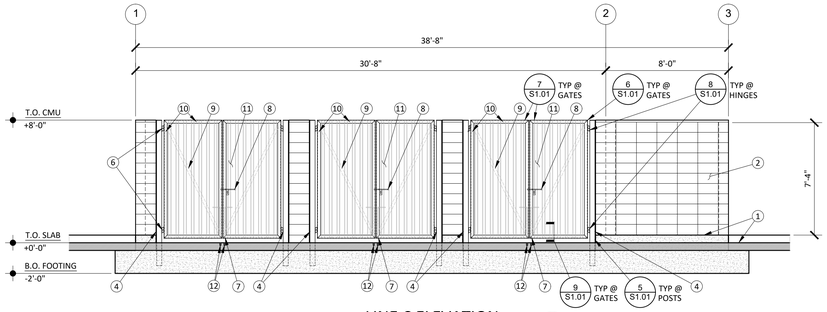
LINE 1 ELEVATION
¼" = 1'-0"
B



LINE 3 ELEVATION
¼" = 1'-0"
C



FOUNDATION PLAN
¼" = 1'-0"
N



LINE C ELEVATION
¼" = 1'-0"
A

FOUNDATION PLAN NOTES:

1. REFER TO CIVIL DRAWINGS, PROJECT SPECIFICATIONS & GEOTECHNICAL REPORT FOR PREPARATION OF BUILDING PAD.
2. REFER TO SHEET S0.01 FOR TYPICAL STRUCTURAL NOTES.
3. CONTRACTOR SHALL COORDINATE ALL WORK CONTAINED HEREIN WITH ALL PROJECT WORK BY OTHERS INCLUDING CIVIL, ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMPING & LANDSCAPE. ALL EXTERIOR CONCRETE WORK IS PER CIVIL / ARCHITECTURAL SITE PLAN.
4. DIMENSIONS ARE TO FACE OF CMU WALLS AND CENTERLINE OF POSTS, UNO. COORDINATE ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS & NOTIFY ARCHITECT IMMEDIATELY IF ANY DISCREPANCIES ARE FOUND.

FOUNDATION PLAN LEGEND:

CMU WALL w/ CURB ON MATT SLAB

PIER FOOTING

POST / PIPE

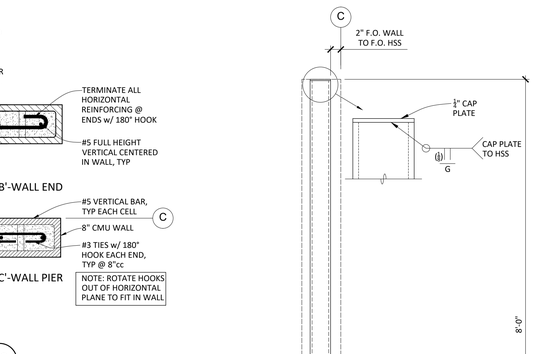
KEY NOTES:

1. 6" THICK SLAB w/ #5 BARS @ 18"oc EACH WAY CENTERED IN DEPTH OF MAT SLAB
2. 8" FULLY GROUTED CMU WALL CONSTRUCTED AS STACKED BOND w/ #5 VERTICAL BARS @ 16"oc & #5 HORIZONTAL BARS @ 16"oc - ALL HORIZONTAL BARS ARE TO TERMINATE w/ A 180° HOOK
3. 6" HIGH CURB, TYP
4. HSS4x4x¼ GATE POST
5. SLOPE SLAB TO DRAIN - SEE ARCH DWGS
6. HINGE - SEE ARCH DWGS
7. CANE BOLT - SEE ARCH DWGS
8. SLIDE BOLT - SEE ARCH DWGS
9. ¾x2 PLATE, DIAGONAL
10. L2½x2½x¼
11. B36 x 18 GAGE DECK - WELD TO ALL SUPPORTS PER 6/S1.01
12. CANE BOLT SLEEVE
13. HSS POST & PIER FOOTING PER PC SHADE STRUCTURE DRAWINGS

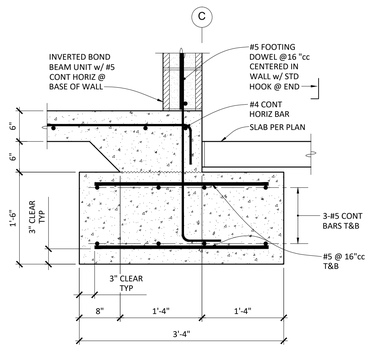
ALL STEEL POSTS AND GATES SHALL BE GALVANIZED

SEISMIC LOAD RESISTING SYSTEM (SLRS):

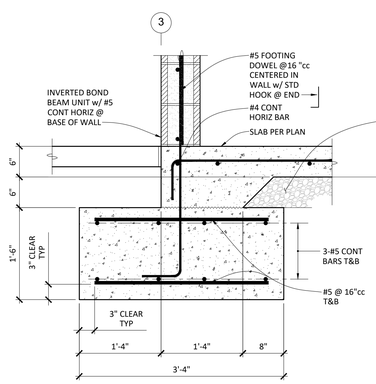
ASCE 7-16 TABLE 15.4-2: GROUND SUPPORTED CANTILEVER WALLS OR FENCES (ASCE 7-16 TABLE 15.4-2)



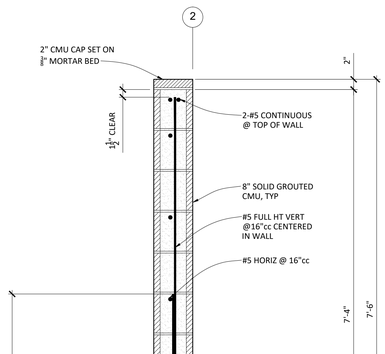
WALL & SLAB SECTION 5
1" = 1'-0"



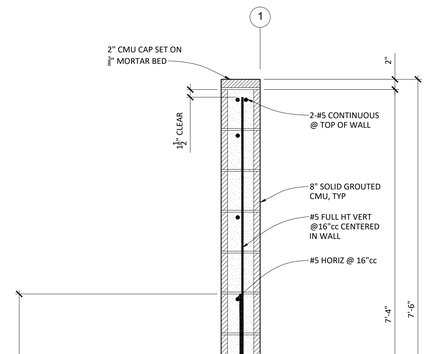
WALL & SLAB SECTION 3
1" = 1'-0"



WALL & SLAB SECTION 4
1" = 1'-0"



WALL & SLAB SECTION 2
1" = 1'-0"



WALL & SLAB SECTION 1
1" = 1'-0"

AGENCY APPROVAL:

LODI USD

HMC DESIGN FOR GOOD Architects
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

ISSUE

Δ	DESCRIPTION	DATE

RW CONSULTING Engineers Inc
1450 HARBOR BLVD SUITE F
WEST SACRAMENTO, CA 95691
916.716.6910

REGISTERED PROFESSIONAL ENGINEER GREGORY T. ROBERTS C 43559 STRUCTURAL STATE OF CALIFORNIA

12/8/2025

FACILITY:

SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE STREET
LODI, CA 95242

PROJECT:

SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:

CMU TRASH ENCLOSURE PLANS, ELEVATIONS & DETAILS

DSA SUBMITTAL

DATE: **12/09/2025**
CLIENT PROJ NO: **3431-010-000**
SHEET:

S1.01

PLEASE RECYCLE

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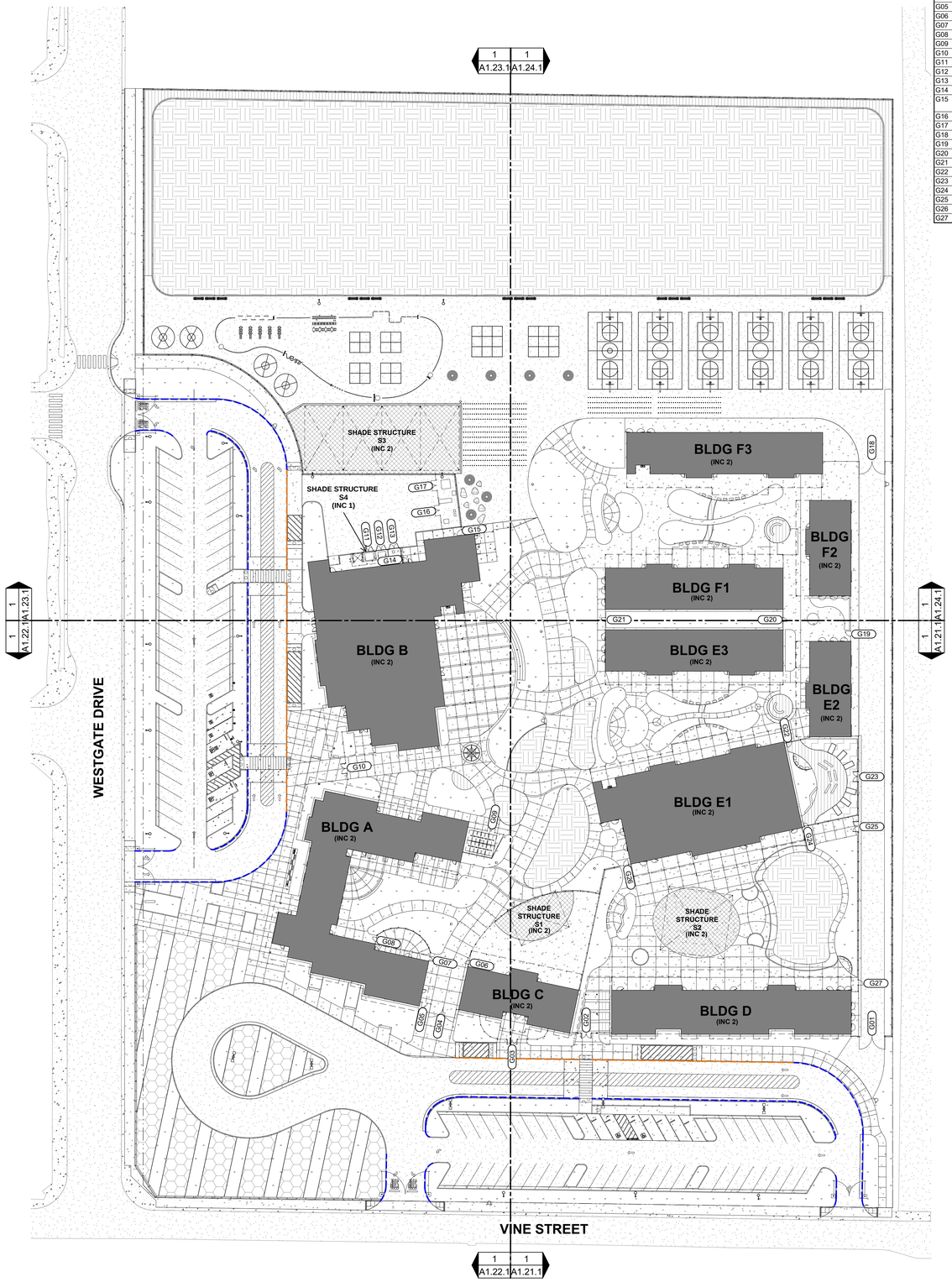


GATE SCHEDULE

NUMBER	WIDTH	PANEL 1	PANEL 2	HEIGHT	MATERIAL	HARDWARE GROUP	PANIC	DETAIL	COMMENTS
G01	20'-0"	10'-0"	10'-0"	7'-0"	DECORATIVE METAL	09	No	17/A10.04.1	
G02	8'-0"	4'-0"	4'-0"	7'-0"	DECORATIVE METAL	08	Yes	8/A10.04.1	CARD READER
G03	8'-0"	4'-0"	4'-0"	7'-0"	DECORATIVE METAL	08	Yes	8/A10.04.1	CARD READER
G04	20'-0"	10'-0"	10'-0"	7'-0"	DECORATIVE METAL	09	No	17/A10.04.1	
G05	4'-0"	4'-0"		7'-0"	DECORATIVE METAL	01	Yes	6/A10.04.1	CARD READER
G06	4'-0"	4'-0"		4'-0"	DECORATIVE METAL	03	Yes	7/A10.04.1	
G07	4'-0"	4'-0"		6'-0"	PERFORATED METAL	04	Yes	9/A10.04.1	
G08	4'-0"	4'-0"		6'-0"	PERFORATED METAL	04	Yes	9/A10.04.1	
G09	8'-0"	4'-0"	4'-0"	7'-0"	CHAIN LINK	09	No	3/A10.03.1	
G10	8'-0"	4'-0"	4'-0"	7'-0"	DECORATIVE METAL	08	Yes	8/A10.04.1	
G11	8'-0"	4'-0"	4'-0"	7'-0"	CORRIGATED METAL	09	No	1/A10.05.1	
G12	8'-0"	4'-0"	4'-0"	7'-0"	CORRIGATED METAL	09	No	1/A10.05.1	
G13	8'-0"	4'-0"	4'-0"	7'-0"	CORRIGATED METAL	09	No	1/A10.05.1	
G14	4'-0"	4'-0"		7'-0"	CORRIGATED METAL	05	No	2/A10.05.1	
G15	4'-0"	4'-0"		7'-0"	CHAIN LINK	02	Yes	11/A10.04.1	WITH SLATS, CARD READER
G16	8'-0"	4'-0"	4'-0"	7'-0"	CHAIN LINK	09	No	3/A10.03.1	WITH SLATS
G17	8'-0"	4'-0"	4'-0"	7'-0"	CHAIN LINK	09	No	3/A10.03.1	WITH SLATS
G18	20'-0"	10'-0"	10'-0"	7'-0"	CHAIN LINK	09	No	3/A10.03.1	WITH SLATS
G19	4'-0"	4'-0"		4'-0"	DECORATIVE METAL	07	No	7/A10.04.1	
G20	4'-0"	4'-0"		7'-0"	CHAIN LINK	06	No	2/A10.03.1	
G21	4'-0"	4'-0"		7'-0"	CHAIN LINK	06	No	2/A10.03.1	
G22	4'-0"	4'-0"		4'-0"	CHAIN LINK	03	Yes	13/A10.04.1	
G23	4'-0"	4'-0"		4'-0"	DECORATIVE METAL	07	No	7/A10.04.1	
G24	4'-0"	4'-0"		4'-0"	DECORATIVE METAL	03	Yes	7/A10.04.1	
G25	8'-0"	4'-0"	4'-0"	4'-0"	DECORATIVE METAL	10	No	17/A10.04.1	
G26	4'-0"	4'-0"		4'-0"	DECORATIVE METAL	03	Yes	7/A10.04.1	
G27	4'-0"	4'-0"		4'-0"	DECORATIVE METAL	03	Yes	7/A10.04.1	

LEGEND

- PROPERTY LINE
- MATCHLINE
- RED PAINTED FIRE LANE CURB, SEE CIVIL
- DROP-OFF LANE CURB PAINTING, SEE CIVIL
- NEW BUILDING (INC 2)
- CONCRETE, SEE CIVIL
- ASPHALT, SEE CIVIL
- GRASS, SEE LANDSCAPE
- ARTIFICIAL TURF, SEE LANDSCAPE
- PLANTING, SEE LANDSCAPE
- GRAVEL, SEE LANDSCAPE
- DECOMPOSED GRAVEL, SEE LANDSCAPE
- WALK-ON BARK. SEE LANDSCAPE
- CHAINLINK FENCE
- DECORATE METAL FENCING
- PERFORATED METAL FENCING

OVERALL SITE PLAN 1
1" = 40'-0"

TN

AGENCY APPROVAL:

LODI USD

HMC Architects
DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

LICENSED ARCHITECT JENNIFER PEARSON-HUANG C-35691 REN. 05/31/25 STATE OF CALIFORNIA

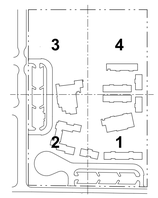
ISSUE

Δ	DESCRIPTION	DATE

NOTES

1. REFER TO SHEET G0.11 FOR TYPICAL SYMBOLS AND ABBREVIATIONS
2. REFER TO LANDSCAPE DRAWINGS FOR PAVING AND PLANTING INFORMATION
3. REFER TO CIVIL AND ELECTRICAL DRAWINGS FOR UTILITY INFORMATION
4. CONTRACTOR IS RESPONSIBLE FOR REPAIR/REPLACEMENT OF ALL HARDSCAPE/PLANTING OUTSIDE OF LIMIT OFWORK LINE FOR CONNECTION OF UNDERGROUND UTILITIES

KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
CAMPUS SITE PLAN

DSA SUBMITTAL

DATE: **2025-09-26**
CLIENT PROJ NO:

SHEET:

A1.11.1

PLEASE RECYCLE

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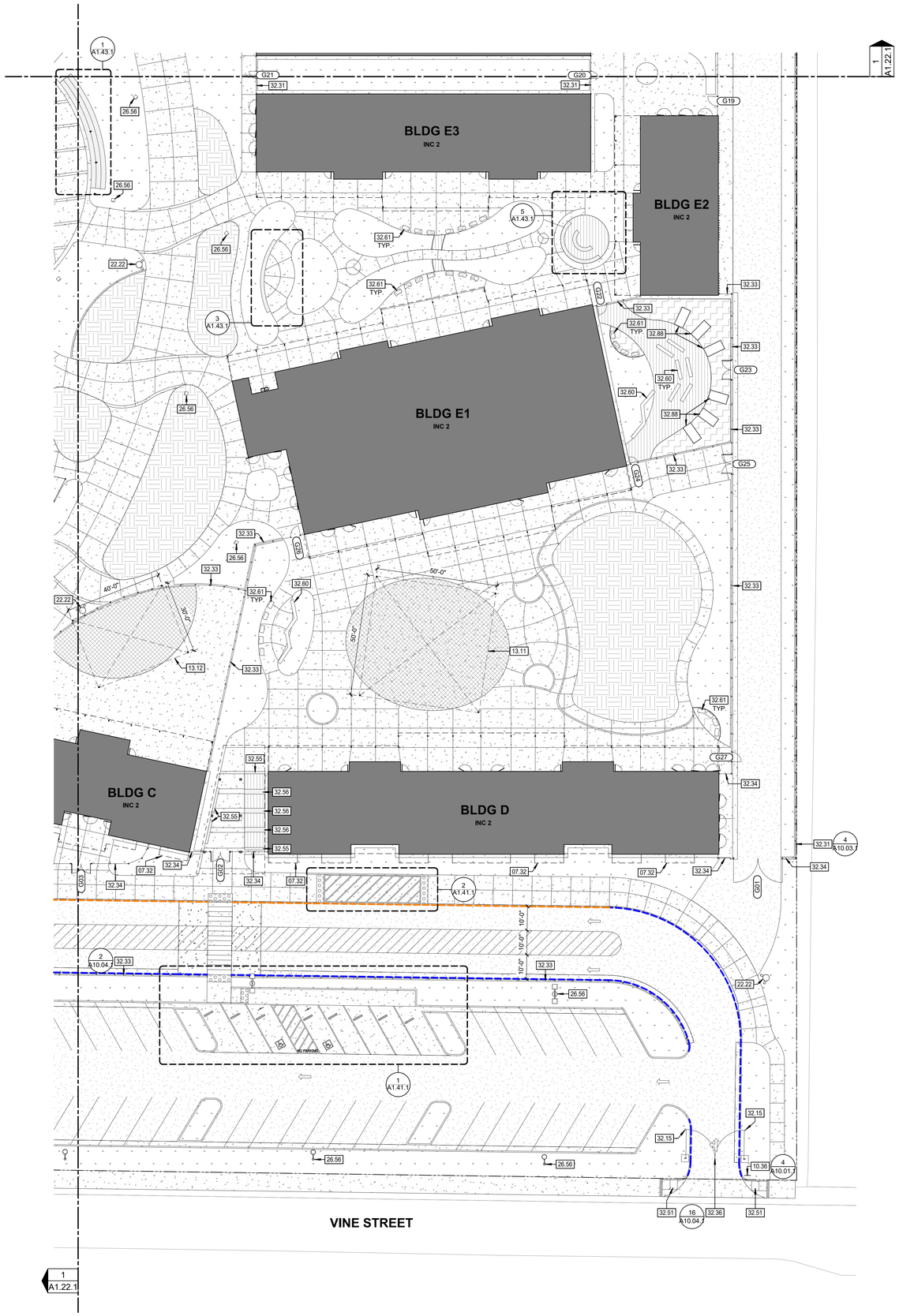


LEGEND

- PROPERTY LINE
- MATCHLINE
- RED PAINTED FIRE LANE CURB, SEE CIVIL
- DROP-OFF LANE CURB PAINTING, SEE CIVIL
- NEW BUILDING (INC 2)
- CONCRETE, SEE CIVIL
- ASPHALT, SEE CIVIL
- GRASS, SEE LANDSCAPE
- ARTIFICIAL TURF, SEE LANDSCAPE
- PLANTING, SEE LANDSCAPE
- GRAVEL, SEE LANDSCAPE
- DECOMPOSED GRAVEL, SEE LANDSCAPE
- WALK-ON BARK. SEE LANDSCAPE
- CHAINLINK FENCE
- DECORATE METAL FENCING
- PERFORATED METAL FENCING

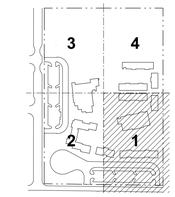
KEYNOTES

07.32	CANOPY OVERHANG BOUNDARY | INC 2
10.36	TOW-AWAY SIGN | CIVIL
13.11	50' X 50' PC SHADE STRUCTURE | INC 2
13.12	40' X 30' PC SHADE STRUCTURE | INC 2
22.22	FIRE HYDRANT | SEE CIVIL
26.56	LIGHT POLE | ELEC
32.15	SWING ARM BARRIER GATE BOLLARD
32.31	7'-0" HIGH CHAIN LINK FENCING
32.33	4'-0" HIGH DECORATIVE METAL FENCING
32.34	7'-0" HIGH DECORATIVE METAL FENCING
32.36	SWING ARM BARRIER GATE - DOUBLE
32.51	TRUNCATED DOMES / DETECTABLE WARNINGS | CIVIL
32.55	PRECAST CONCRETE BENCH | LANDSCAPE
32.56	CAST-IN-PLACE CONCRETE AMPHITHEATER SEATING
32.60	SITE FURNISHING | LANDSCAPE
32.61	SEATING STONE | LANDSCAPE
32.88	PLANTER BOX | LANDSCAPE

NOTES

1. REFER TO SHEET G0.11 FOR TYPICAL SYMBOLS AND ABBREVIATIONS
2. REFER TO LANDSCAPE DRAWINGS FOR PAVING AND PLANTING INFORMATION
3. REFER TO CIVIL AND ELECTRICAL DRAWINGS FOR UTILITY INFORMATION
4. CONTRACTOR IS RESPONSIBLE FOR REPAIR/REPLACEMENT OF ALL HARDSCAPE/PLANTING OUTSIDE OF LIMIT OFWORK LINE FOR CONNECTION OF UNDERGROUND UTILITIES

KEY PLAN



AGENCY APPROVAL:

LODI USD

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SACRAMENTO, CA, 95816
916.368.7990 / www.hmcarchitects.com

LICENSED ARCHITECT
JENNIFER PEARSON HWANG
C-35691
REN. 05/31/25
STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
PARTIAL SITE PLAN - SEGMENT 1

DSA SUBMITTAL

DATE: **2025-09-26**
CLIENT PROJ NO:

SHEET:
A1.21.1

PARTIAL SITE PLAN - SEGMENT 1 | **1** | 1" = 20'-0"

PLEASE RECYCLE

Autodesk Docs://3431010000 LODI USD SAMUEL M. GANTNER ES R24/3431010000-A-LUSD-GANTNER ES-SITE.rvt
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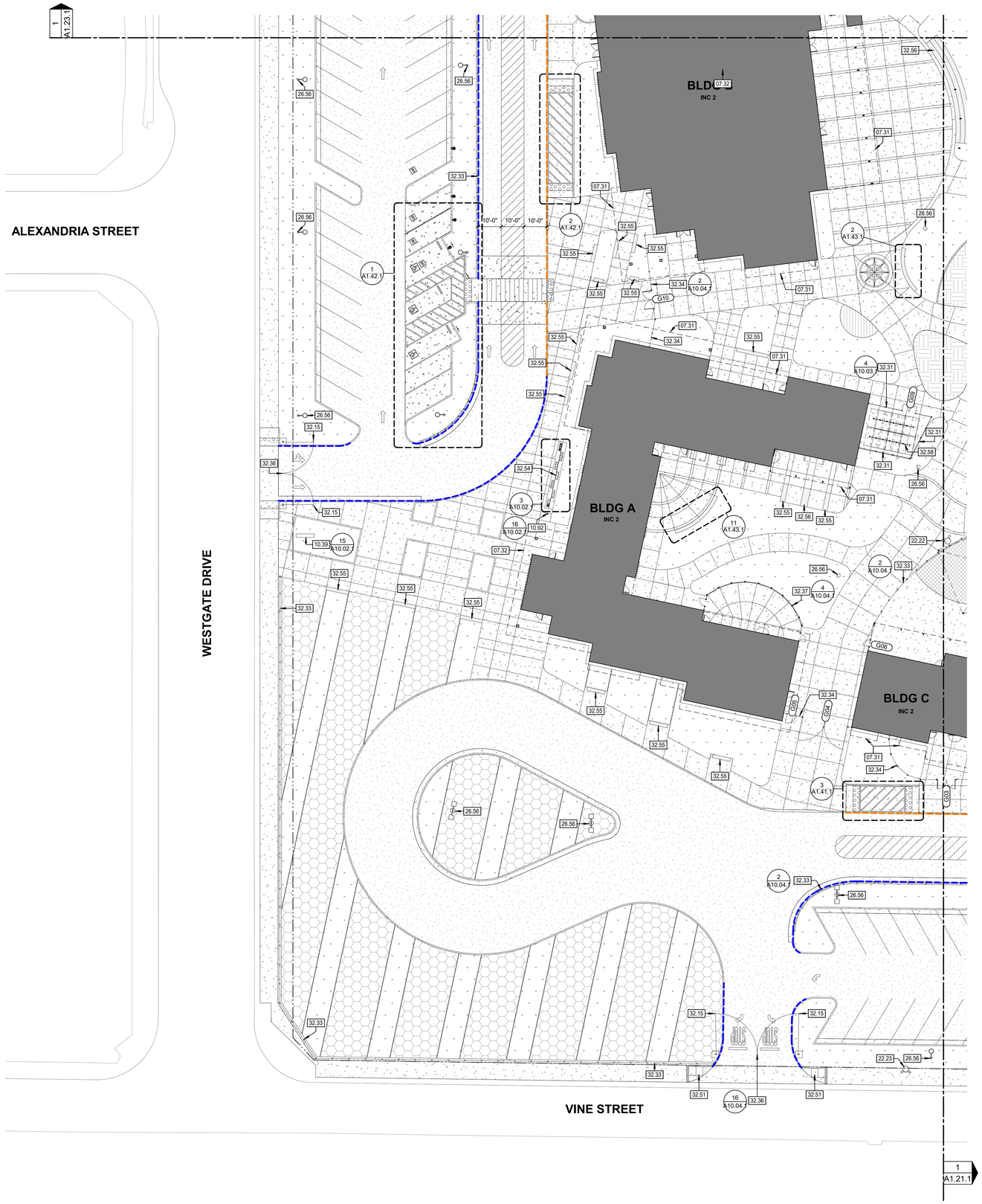


LEGEND

- PROPERTY LINE
- MATCHLINE
- RED PAINTED FIRE LANE CURB, SEE CIVIL
- DROP-OFF LANE CURB PAINTING, SEE CIVIL
- NEW BUILDING (INC 2)
- CONCRETE, SEE CIVIL
- ASPHALT, SEE CIVIL
- GRASS, SEE LANDSCAPE
- ARTIFICIAL TURF, SEE LANDSCAPE
- PLANTING, SEE LANDSCAPE
- GRAVEL, SEE LANDSCAPE
- DECOMPOSED GRAVEL, SEE LANDSCAPE
- WALK-ON BARK. SEE LANDSCAPE
- CHAINLINK FENCE
- DECORATE METAL FENCING
- PERFORATED METAL FENCING

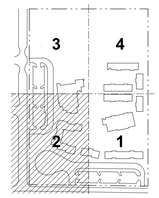
KEYNOTES

07.31	ROOF OVERHANG BOUNDARY | INC 2
07.32	CANOPY OVERHANG BOUNDARY | INC 2
10.39	MARQUEE SIGN
10.92	FLAGPOLE
22.22	FIRE HYDRANT | SEE CIVIL
22.23	EXISTING FIRE HYDRANT
26.56	LIGHT POLE | ELEC
32.15	SWING ARM BARRIER GATE BOLLARD
32.31	7'-0" HIGH CHAIN LINK FENCING
32.33	4'-0" HIGH DECORATIVE METAL FENCING
32.34	7'-0" HIGH DECORATIVE METAL FENCING
32.36	SWING ARM BARRIER GATE - DOUBLE
32.37	6'-0" HIGH PERFORATED METAL FENCING
32.51	TRUNCATED DOMES / DETECTABLE WARNINGS | CIVIL
32.54	PRECAST CONCRETE MONUMENT SIGN | STRUCTURAL
32.55	PRECAST CONCRETE BENCH | LANDSCAPE
32.56	CAST-IN-PLACE CONCRETE AMPHITHEATER SEATING
32.58	BIKE RACK | LANDSCAPE

NOTES

1. REFER TO SHEET G0.11 FOR TYPICAL SYMBOLS AND ABBREVIATIONS
2. REFER TO LANDSCAPE DRAWINGS FOR PAVING AND PLANTING INFORMATION
3. REFER TO CIVIL AND ELECTRICAL DRAWINGS FOR UTILITY INFORMATION
4. CONTRACTOR IS RESPONSIBLE FOR REPAIR/REPLACEMENT OF ALL HARDSCAPE/PLANTING OUTSIDE OF LIMIT OFWORK LINE FOR CONNECTION OF UNDERGROUND UTILITIES

KEY PLAN



AGENCY APPROVAL:

LODI USD

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DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

LICENSED ARCHITECT JENNIFER PEARSON-HWANG C-35691 REN. 05/31/25 STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
PARTIAL SITE PLAN - SEGMENT 2

DSA SUBMITTAL

DATE: **2025-09-26**
CLIENT PROJ NO:
SHEET:

A1.22.1

PARTIAL SITE PLAN - SEGMENT 2 **1** 1" = 20'-0"

Autodesk Docs://3431010000 LODI USD SAMUEL M. GANTNER ES R24/3431010000-A-LUSD-GANTNER ES-SITE.rvt
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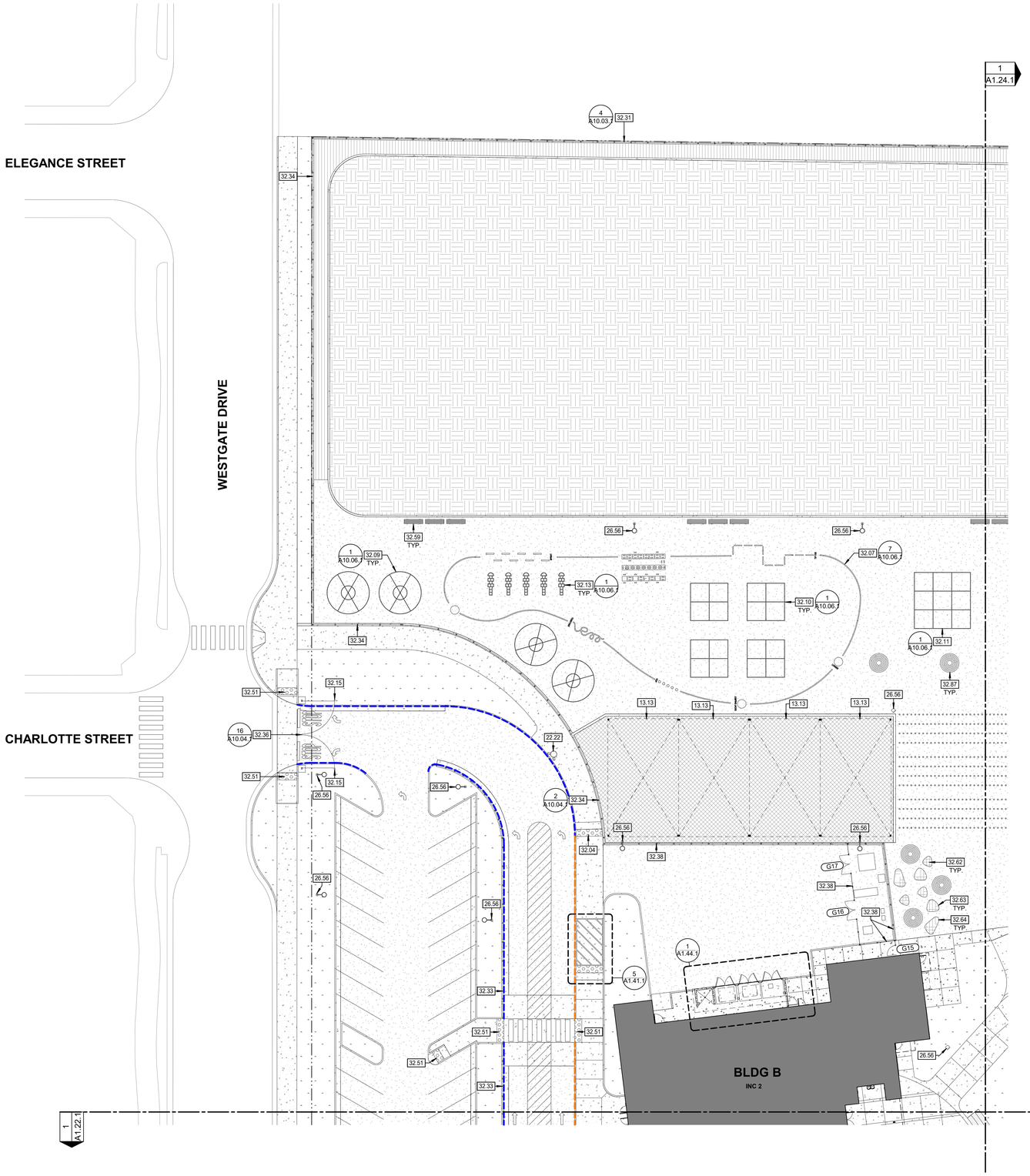

LEGEND

- PROPERTY LINE
- MATCHLINE
- RED PAINTED FIRE LANE CURB, SEE CIVIL
- DROP-OFF LANE CURB PAINTING, SEE CIVIL
- NEW BUILDING (INC 2)
- CONCRETE, SEE CIVIL
- ASPHALT, SEE CIVIL
- GRASS, SEE LANDSCAPE
- ARTIFICIAL TURF, SEE LANDSCAPE
- PLANTING, SEE LANDSCAPE
- GRAVEL, SEE LANDSCAPE
- DECOMPOSED GRAVEL, SEE LANDSCAPE
- WALK-ON BARK. SEE LANDSCAPE
- CHAINLINK FENCE
- DECORATE METAL FENCING
- PERFORATED METAL FENCING

AGENCY APPROVAL:

LODI USD

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SACRAMENTO, CA, 95816
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LICENSED ARCHITECT JENNIFER PEARSON HWANG C-35691 REN. 05/31/25 STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

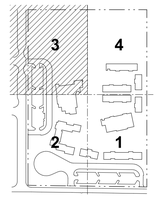
KEYNOTES

13.13	50' X 30' PC SHADE STRUCTURE | INC 2
22.22	FIRE HYDRANT | SEE CIVIL
26.56	LIGHT POLE | ELEC
32.04	TRUNCATED DOMES | CIVIL
32.07	CHALLENGE COURSE
32.09	TETHERBALL GAME LINES
32.10	FOUR SQUARE GAME LINES
32.11	NINE SQUARE GAME LINES
32.13	HOP SCOTCH GAME LINES
32.15	SWING ARM BARRIER GATE BOLLARD
32.31	7'-0" HIGH CHAIN LINK FENCING
32.33	4'-0" HIGH DECORATIVE METAL FENCING
32.34	7'-0" HIGH DECORATIVE METAL FENCING
32.36	SWING ARM BARRIER GATE - DOUBLE
32.38	7'-0" HIGH HIGH CHAIN LINK FENCING WITH PRIVACY SLATTS
32.51	TRUNCATED DOMES / DETECTABLE WARNINGS | CIVIL
32.59	BENCH | LANDSCAPE
32.62	PRECAST CONCRETE SEATING STONE TYPE ZB.GL.01 | LANDSCAPE
32.63	PRECAST CONCRETE SEATING STONE TYPE ZB.GL.02 | LANDSCAPE
32.64	PRECAST CONCRETE SEATING STONE TYPE ZB.GL.03 | LANDSCAPE
32.87	TREE GRATE | LANDSCAPE

NOTES

1. REFER TO SHEET G0.11 FOR TYPICAL SYMBOLS AND ABBREVIATIONS
2. REFER TO LANDSCAPE DRAWINGS FOR PAVING AND PLANTING INFORMATION
3. REFER TO CIVIL AND ELECTRICAL DRAWINGS FOR UTILITY INFORMATION
4. CONTRACTOR IS RESPONSIBLE FOR REPAIR/REPLACEMENT OF ALL HARDSCAPE/PLANTING OUTSIDE OF LIMIT OFWORK LINE FOR CONNECTION OF UNDERGROUND UTILITIES

KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
PARTIAL SITE PLAN - SEGMENT 3

DSA SUBMITTAL

DATE: **2025-09-26** | CLIENT PROJ NO:

SHEET:

A1.23.1

PARTIAL SITE PLAN - SEGMENT 3 **1** 1" = 20'-0"

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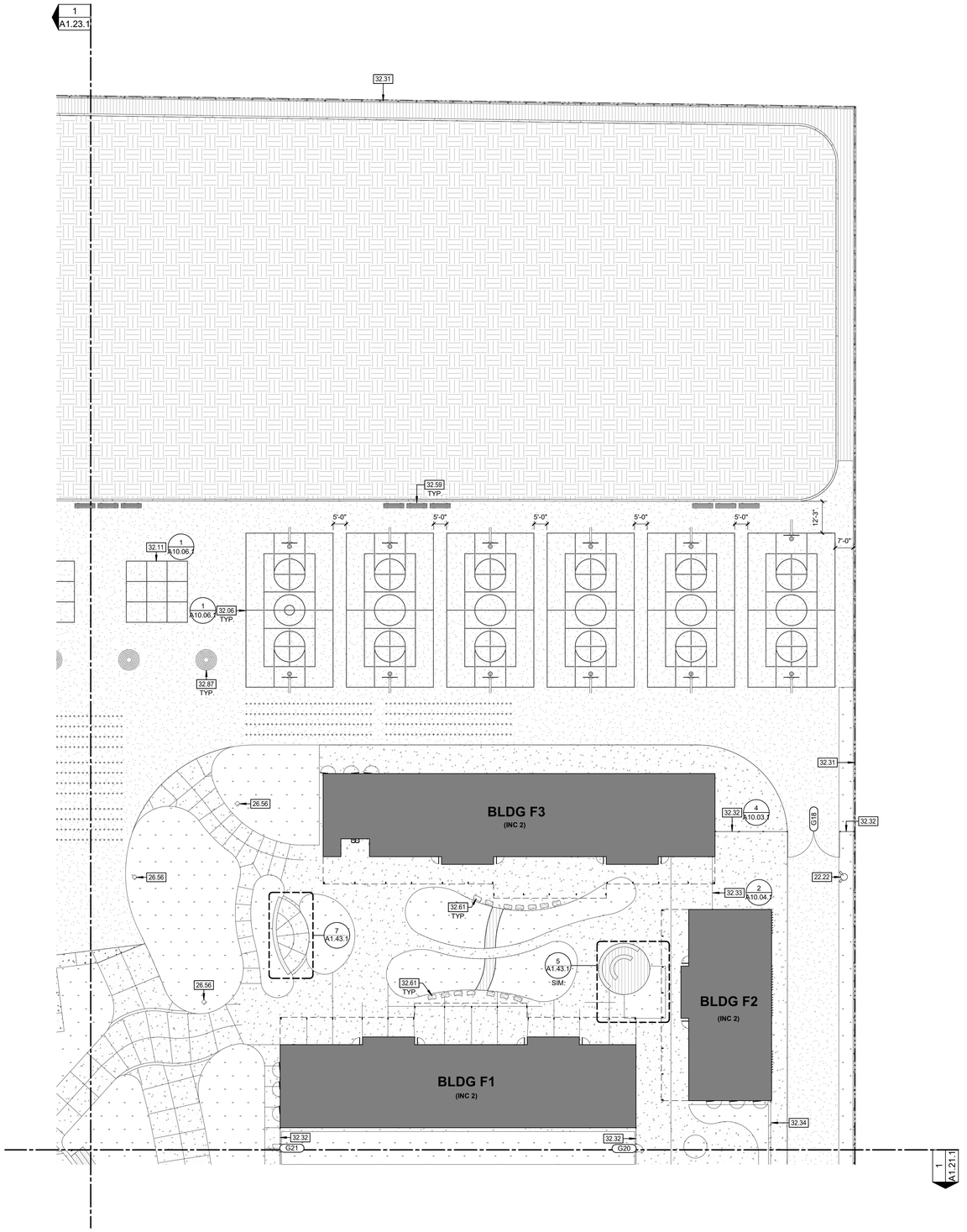

LEGEND

- PROPERTY LINE
- MATCHLINE
- RED PAINTED FIRE LANE CURB, SEE CIVIL
- DROP-OFF LANE CURB PAINTING, SEE CIVIL
- NEW BUILDING (INC 2)
- CONCRETE, SEE CIVIL
- ASPHALT, SEE CIVIL
- GRASS, SEE LANDSCAPE
- ARTIFICIAL TURF, SEE LANDSCAPE
- PLANTING, SEE LANDSCAPE
- GRAVEL, SEE LANDSCAPE
- DECOMPOSED GRAVEL, SEE LANDSCAPE
- WALK-ON BARK. SEE LANDSCAPE
- CHAINLINK FENCE
- DECORATE METAL FENCING
- PERFORATED METAL FENCING

AGENCY APPROVAL:

LODI USD

HMC Architects
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2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
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LICENSED ARCHITECT
JENNIFER PEARSON HUANG
C-35691
REN. 05/31/25
STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

22.22	FIRE HYDRANT | SEE CIVIL
26.56	LIGHT POLE | ELEC
32.06	BASKETBALL GAME LINES | XX/A10.XX
32.11	NINE SQUARE GAME LINES
32.31	7'-0" HIGH CHAIN LINK FENCING
32.32	CHAIN LINK FENCING, COATED | LANDSCAPE
32.33	4'-0" HIGH DECORATIVE METAL FENCING
32.34	7'-0" HIGH DECORATIVE METAL FENCING
32.59	BENCH | LANDSCAPE
32.61	SEATING STONE | LANDSCAPE
32.87	TREE GRATE | LANDSCAPE

NOTES

1. REFER TO SHEET G0.11 FOR TYPICAL SYMBOLS AND ABBREVIATIONS
2. REFER TO LANDSCAPE DRAWINGS FOR PAVING AND PLANTING INFORMATION
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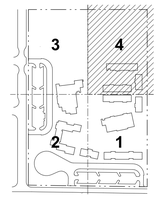
KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
PATRIAL SITE PLAN - SEGMENT 4

DSA SUBMITTAL

DATE: **2025-09-26** | CLIENT PROJ NO:

SHEET:

A1.24.1

PARTIAL SITE PLAN - SEGMENT 4 | **1** | 1" = 20'-0"

PLEASE RECYCLE

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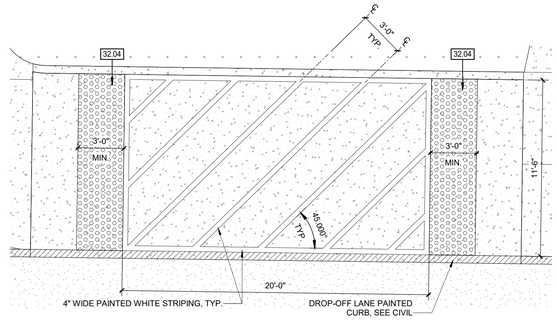
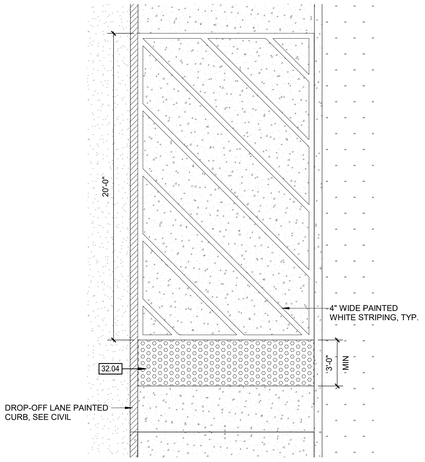
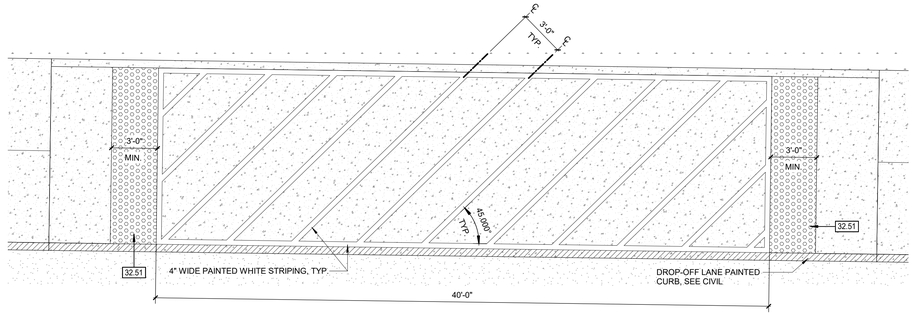


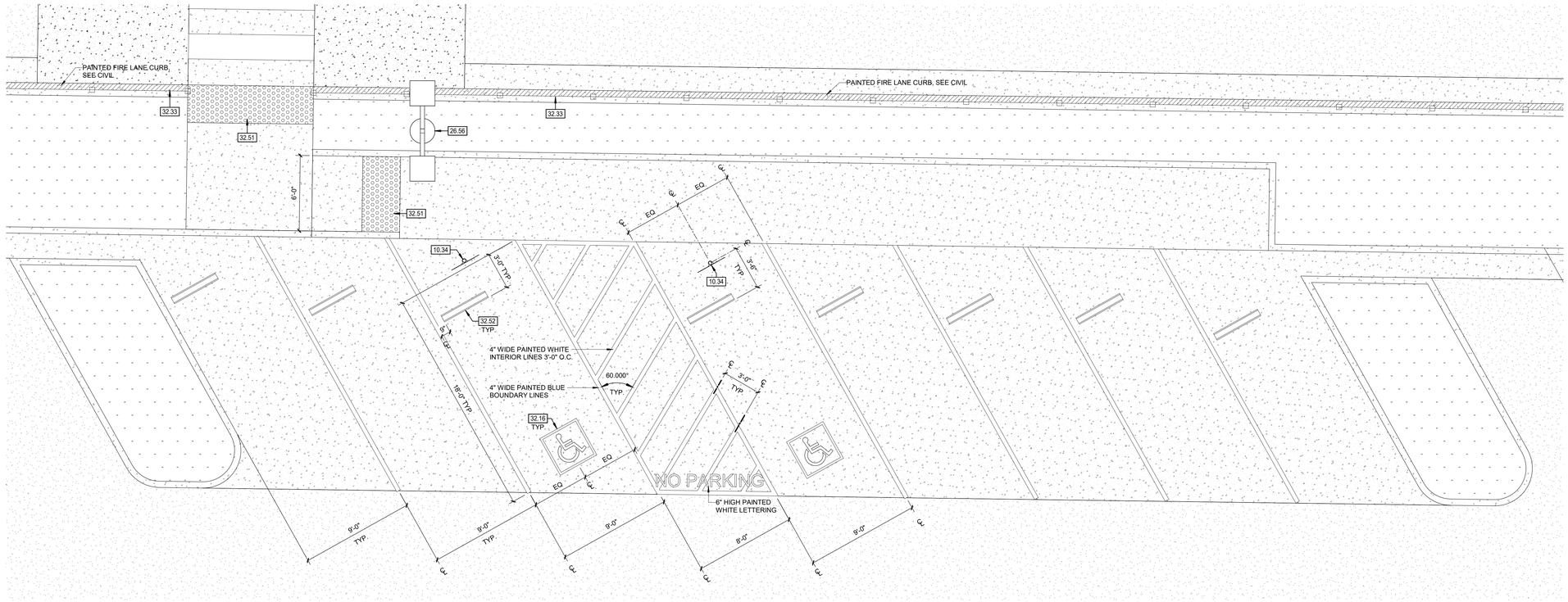
ENLARGED PLAN - LOT P2 WEST DROP-OFF ZONE 3 1/4" = 1'-0"



ENLARGED PLAN - LOT P1 NORTH DROP-OFF ZONE 5 1/4" = 1'-0"



ENLARGED PLAN - LOT P2 EAST DROP-OFF ZONE 2 1/4" = 1'-0"



ENLARGED PLAN - LOT P2 ACCESSIBLE PARKING 1 1/4" = 1'-0"

AGENCY APPROVAL:

LODI USD

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LICENSED ARCHITECT
JENNIFER PEARSON HUANG
C-35691
REN. 05/31/25
STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

10.34	ACCESSIBLE PARKING STALL SIGN | CIVIL
26.56	LIGHT POLE | ELEC
32.04	TRUNCATED DOMES | CIVIL
32.16	ISA SYMBOL | CIVIL
32.33	4'-0" HIGH DECORATIVE METAL FENCING
32.51	TRUNCATED DOMES / DETECTABLE WARNINGS | CIVIL
32.52	CONC WHEEL STOP, ANCHORED TO PAVING | CIVIL

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
ENLARGED SITE PLANS

DSA SUBMITTAL

DATE: **2025-09-26** CLIENT PROJ NO:

SHEET:

A1.41.1

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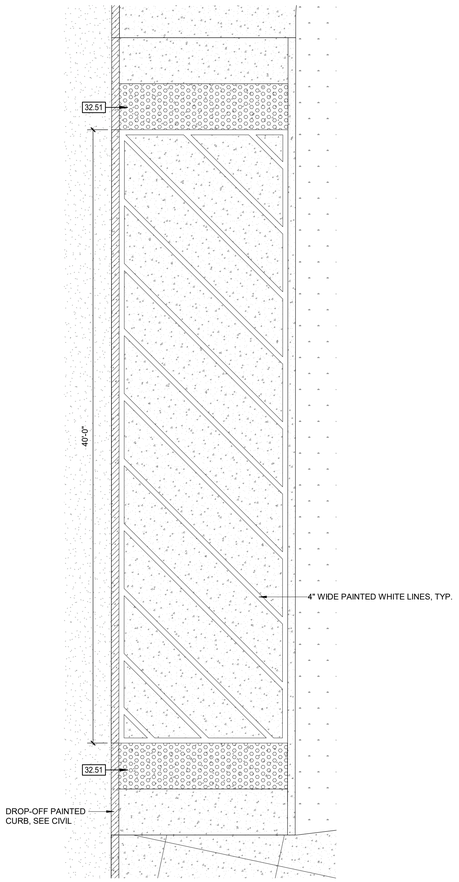
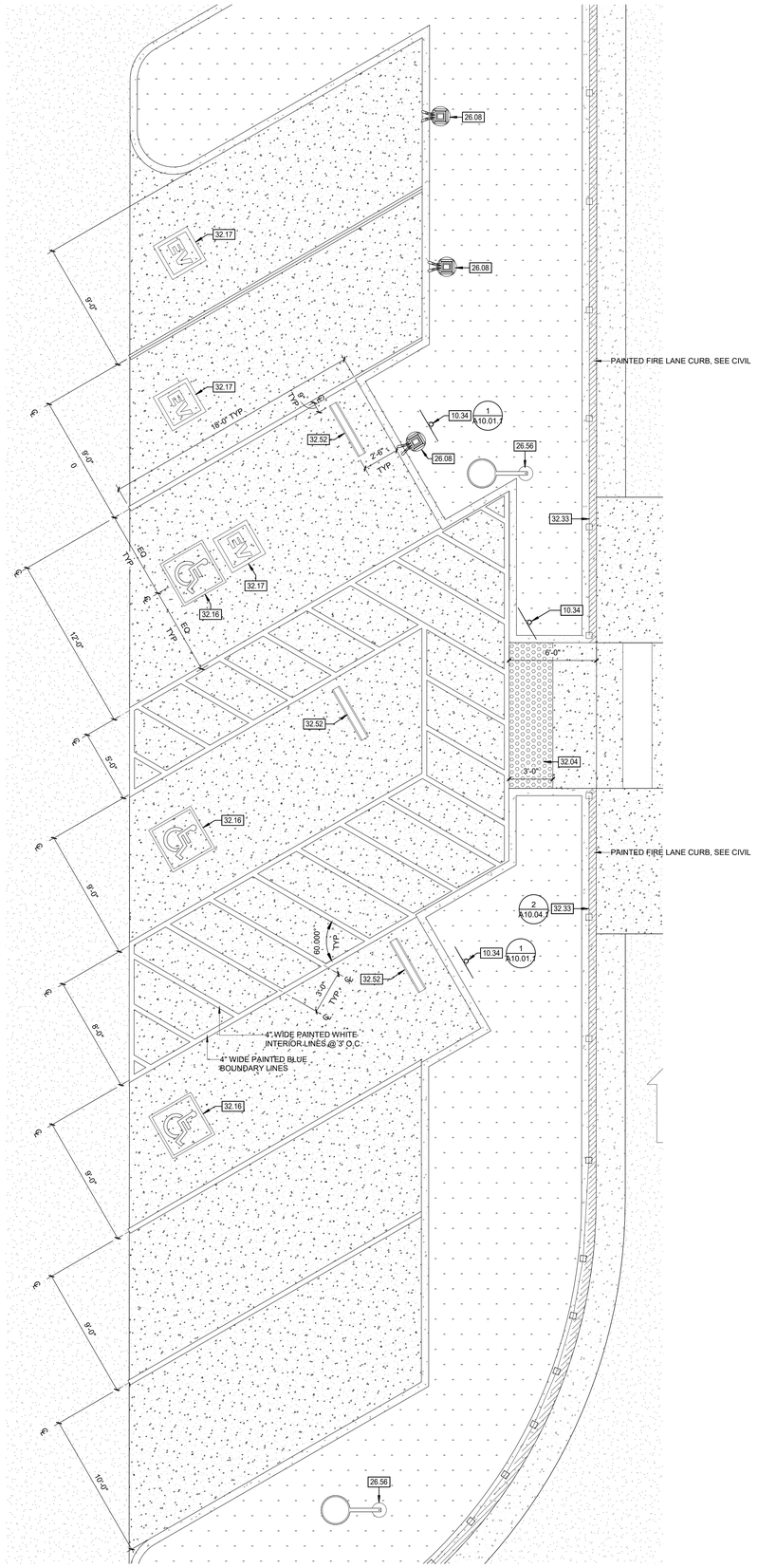


ENLARGED PLAN - LOT P1 SOUTH DROP-OFF ZONE 2
1/4" = 1'-0"



ENLARGED PLAN - LOT P1 ACCESSIBLE PARKING 1
1/4" = 1'-0"

AGENCY APPROVAL:

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LICENSED ARCHITECT
JENNIFER PEARSON HUANG
C-35691
REN. 05/31/25
STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

10.34	ACCESSIBLE PARKING STALL SIGN | CIVIL
26.08	EV CHARGING STATION | ELEC
26.56	LIGHT POLE | ELEC
32.04	TRUNCATED DOMES | CIVIL
32.16	ISA SYMBOL | CIVIL
32.17	EV PARKING SYMBOL | CIVIL
32.33	4'-0" HIGH DECORATIVE METAL FENCING
32.51	TRUNCATED DOMES / DETECTABLE WARNINGS | CIVIL
32.52	CONC WHEEL STOP, ANCHORED TO PAVING | CIVIL

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
ENLARGED SITE PLANS

DSA SUBMITTAL

DATE: 2025-09-26
CLIENT PROJ NO:
SHEET:

A1.42.1

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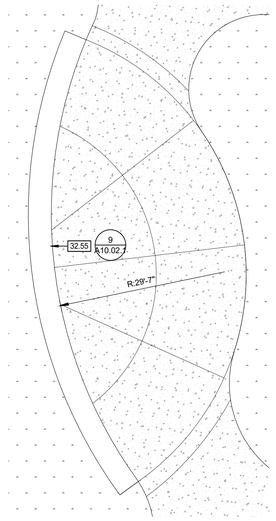
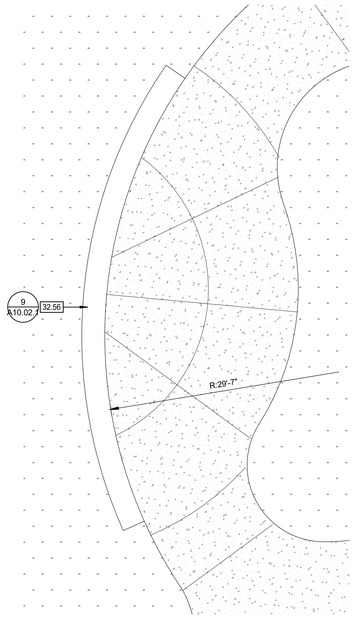
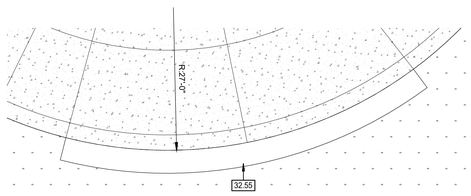


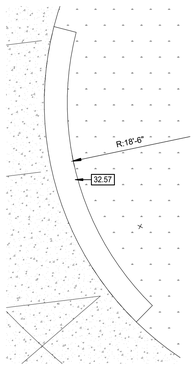
ENLARGED PLAN - UPPER GRADE COURTYARD **7** 1/4" = 1'-0"



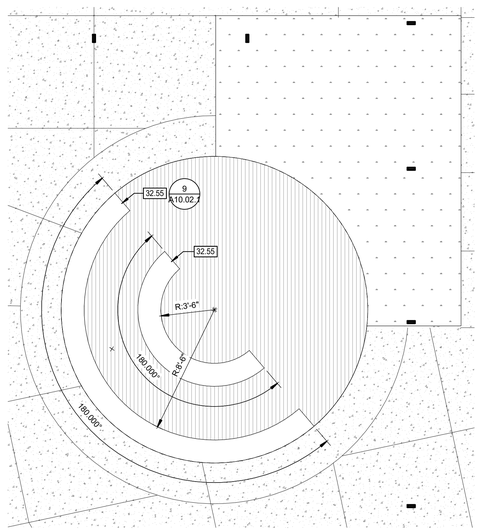
ENLARGED SITE PLAN - LOWER GRADE COURTYARD **3** 1/4" = 1'-0"



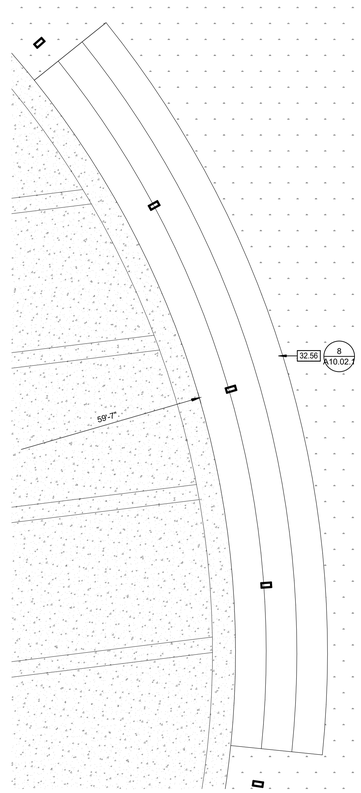
ENLARGED SITE PLAN - ADMIN COURTYARD **11** 1/4" = 1'-0"



ENLARGED SITE PLAN - ENTRY SEAT WALL **2** 1/4" = 1'-0"



ENLARGED SITE PLAN - OUTDOOR TEACHING AREA **5** 1/4" = 1'-0"



ENLARGED SITE PLAN - AMPHETHEATER SEATING **1** 1/4" = 1'-0"

PLEASE RECYCLE

AGENCY APPROVAL:

LODI USD

HMC Architects DESIGN FOR GOOD
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2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
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LICENSED ARCHITECT
JENNIFER PEARSON HUANG
C-35691
REN. 05/31/25
STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	×	DATE

KEYNOTES

32.55	PRECAST CONCRETE BENCH | LANDSCAPE
32.56	CAST-IN-PLACE CONCRETE AMPHITHEATER SEATING
32.57	CAST IN PLACE CONCRETE SIGN WALL | LANDSCAPE

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
ENLARGED SITE PLANS

DSA SUBMITTAL

DATE: **2025-09-26** | CLIENT PROJ NO:

SHEET:

A1.43.1

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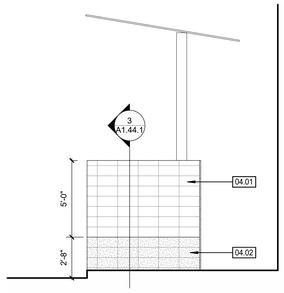
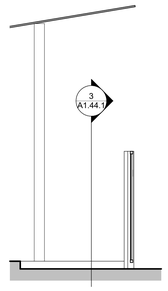
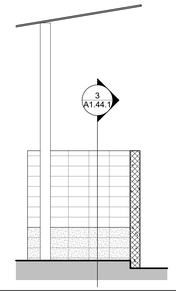


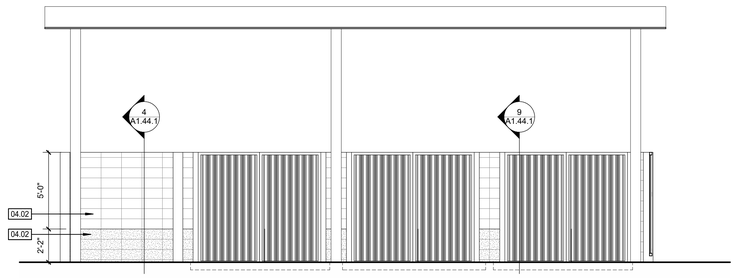
TRASH ENCLOSURE - WEST 19 1/4" = 1'-0"



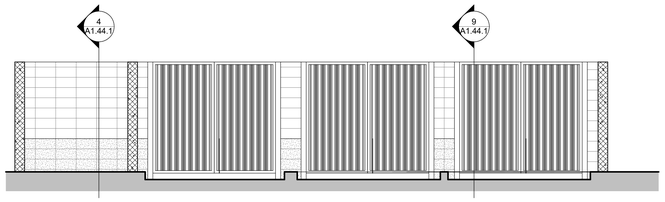
TRASH ENCLOSURE SECTION2 9 1/4" = 1'-0"



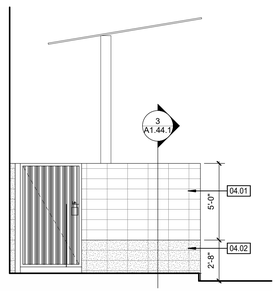
TRASH ENCLOSURE SECTION1 4 1/4" = 1'-0"



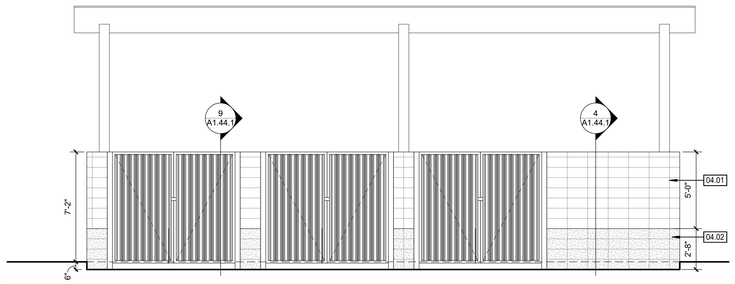
TRASH ENCLOSURE - SOUTH 18 1/4" = 1'-0"



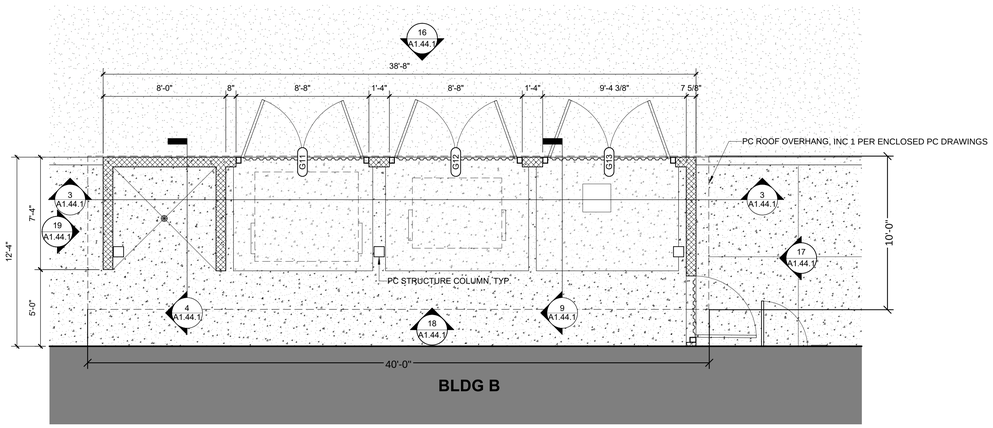
TRASH ENCLOSURE SECTION 3 1/4" = 1'-0"



TRASH ENCLOSURE - EAST 17 1/4" = 1'-0"



TRASH ENCLOSURE - NORTH 16 1/4" = 1'-0"



ENLARGED PLAN - TRASH ENCLOSURE 1 1/4" = 1'-0"

AGENCY APPROVAL:

LODI USD

HMC Architects DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

LICENSED ARCHITECT
JENNIFER PEARSON-NAAG
C-35691
REN. 05/31/25
STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

04.01	GROUND FACE STACK BOND CMU WALL
04.02	SPLIT FACE STACK BOND CMU WALL

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
ENLARGED TRASH ENCLOSURE PLANS, ELEVATIONS, AND SECTIONS

DSA SUBMITTAL

DATE: **2025-09-26** | CLIENT PROJ NO:

SHEET:

A1.44.1

Autodesk Docs://3431010000 LODI USD SAMUEL M. GANTNER ES R24/3431010000-A-LUSD-GANTNER ES-SITE.rvt
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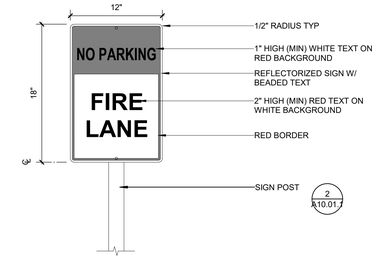
PLEASE RECYCLE

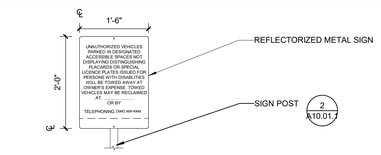
THE LINE SHOWN ABOVE IS EXACTLY 1" WHEN PLOTTED AT FIVE SHEETS ORIGINAL PAGE SIZE



10.14.31.01

NO PARKING SIGN PANEL 5

1 1/2" = 1'-0"



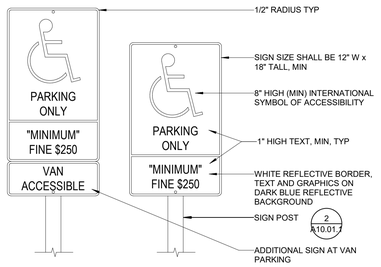
NOTE:

1. A REFLECTORAIZED SIGN SHALL BE PERMANENTLY POSTED IN A CONSPICUOUS PLACE AT EACH ENTRANCE TO OFF-STREET PARKING FACILITIES OR IMMEDIATELY ADJACENT TO AND VISIBLE FROM EACH STALL OR SPACE. THE SIGN SHALL NOT BE LESS THAN 18" BY 24" IN SIZE WITH WHITE LETTERING NOT LESS THAN 2" IN HEIGHT ON A DARK BLUE BACKGROUND.
2. SIGN SHALL NOT OBSTRUCT PASSAGE BETWEEN STALL AND ANY ACCESSIBLE WALKWAY. SEE SITE PLAN FOR ADDITIONAL INFORMATION.
3. CONFIRM RECLAMATION ADDRESS AND TELEPHONE NUMBER WITH OWNER PRIOR TO AGENCY APPROVAL.
4. RECLAMATION ADDRESS AND TELEPHONE NUMBER SHALL BE A PERMANENT PART OF THIS SIGN.
5. DARK BLUE BACKGROUND SHALL BE EQUAL TO COLOR NUMBER 15090 IN FEDERAL STANDARD 595C.

10.14.29.01

TOW-AWAY SIGN PANEL 4

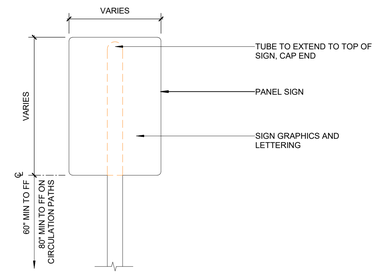
NTS



10.14.33.01

ACCESSIBLE PARKING SIGN PANEL 3

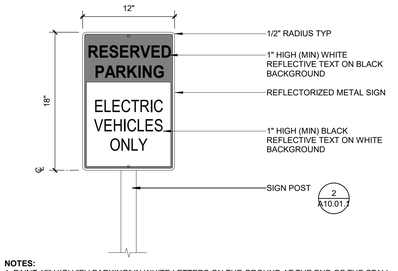
1 1/2" = 1'-0"



10.14.34.01

GENERIC EXTERIOR POST-MOUNTED SIGN PANEL 2

1 1/2" = 1'-0"



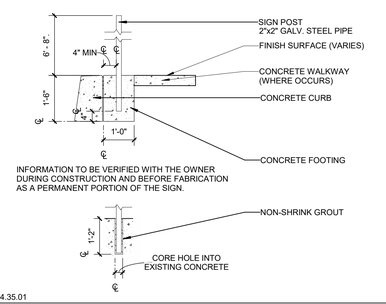
NOTES:

1. PAINT 12" HIGH "EV PARKING" IN WHITE LETTERS ON THE GROUND AT THE END OF THE STALL
2. IDENTIFICATION OF ACCESSIBLE EVCS STALLS SHALL BE PROVIDED PER 11B-812.8.

10.14.30.01

RESERVED PARKING SIGN PANEL 6

1 1/2" = 1'-0"



10.14.35.01

POST-AND-PANEL SIGN BASE 1

1/2" = 1'-0"

AGENCY APPROVAL:

LODI USD

HMC Architects
DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

LICENSED ARCHITECT
JENNIFER PEARSON HWANG
C-35691
REN. 05/31/25
STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

FACILITY:

SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:

SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:

SITE SIGNAGE DETAILS

DSA SUBMITTAL

DATE: **2025-09-26**

CLIENT PROJ NO:

SHEET:

A10.01.1

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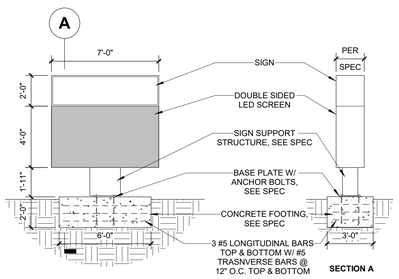
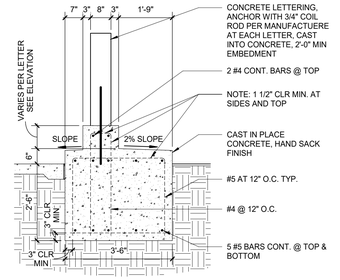
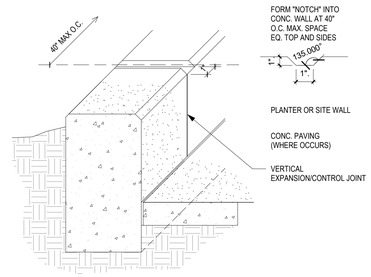


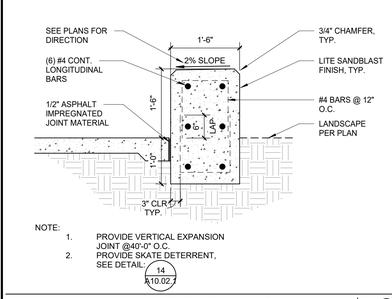
MARQUEE SIGN DETAIL 15 — 1/4" = 1'-0"



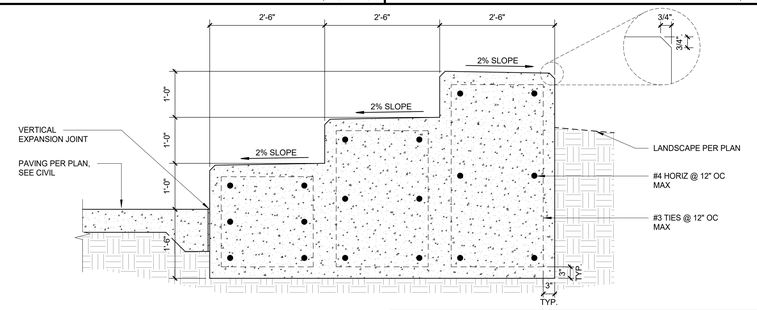
MONUMENT SIGN SECTION THROUGH LETTER, TYP. 10 — 1/2" = 1'-0"



CONCRETE SEAT WALL SKATE DETERRANT 14 — 3/4" = 1'-0"

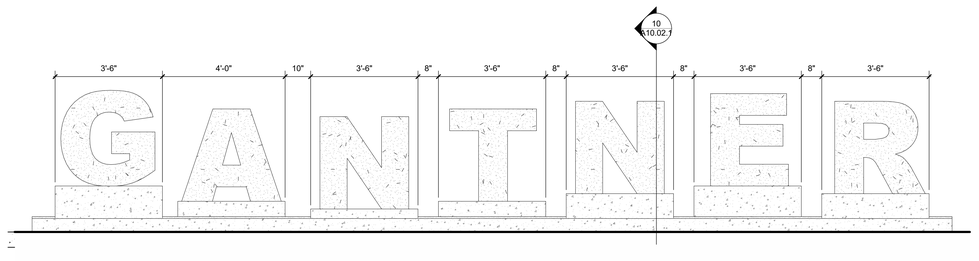


CONCRETE SEAT WALL 9 — 3/4" = 1'-0"

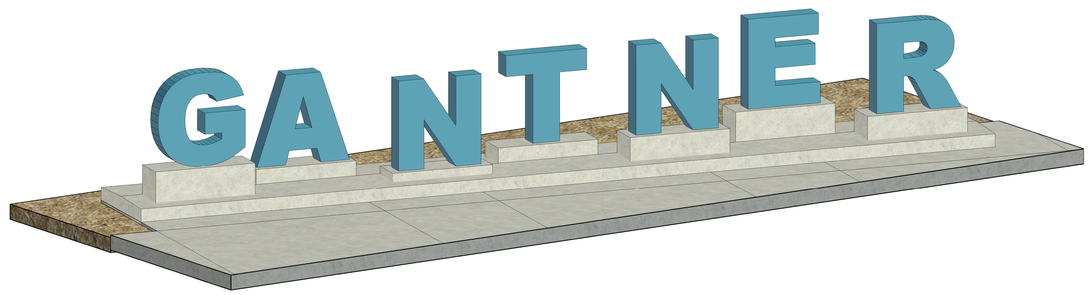


TIERED CONCRETE SEAT WALL 8 — 3/4" = 1'-0"

MONUMENT SIGN PLAN 3 — 1/2" = 1'-0"

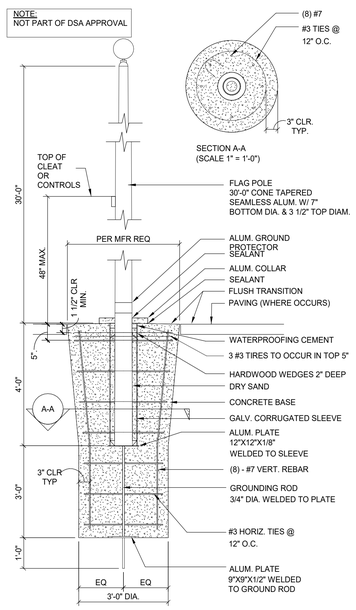


MONUMENT SIGN ELEVATION 2 — 1/2" = 1'-0"



MONUMENT SIGN 3D 1

NOTE:
NOT PART OF DSA APPROVAL



ALUMINUM FLAG POLE 16 — 1/2" = 1'-0"

AGENCY APPROVAL:

LODI USD

HMC Architects
DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

LICENSED ARCHITECT JENNIFER PEARSON HWANG C-35691 REN. 05/31/25 STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
SITE DETAILS

DSA SUBMITTAL

DATE: **2025-09-26** | CLIENT PROJ NO:

SHEET:

A10.02.1

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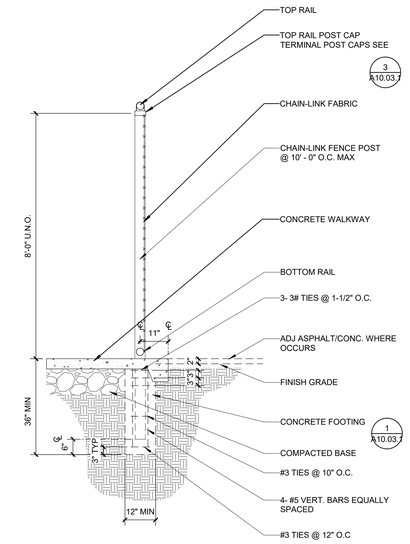
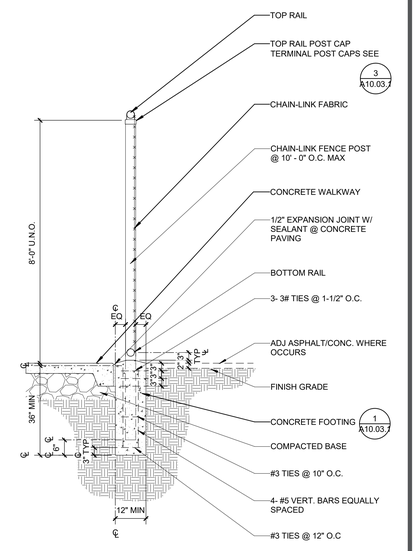


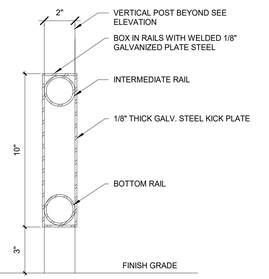
NOTE:
REINFORCING IS ONLY REQUIRED FOR PIERS AS INDICATED PER TABLE IN 1/A10.03.1

CHAIN-LINK FENCE AT PAVING 9
1/2" = 1'-0"

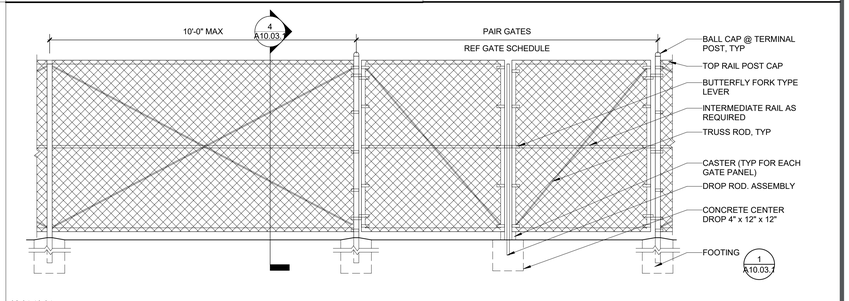


NOTE:
REINFORCING IS ONLY REQUIRED FOR PIERS AS INDICATED PER TABLE IN 1/A10.03.1

TYP. CHAIN-LINK FENCE & POST SECTION 4
1/2" = 1'-0"

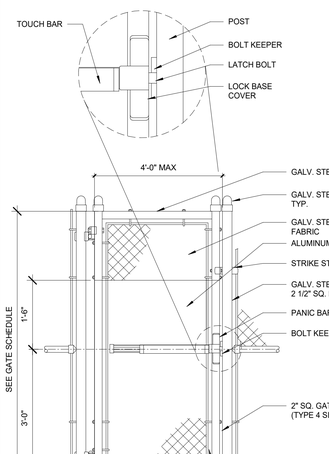


KICKPLATE AT GATE 13
3" = 1'-0"

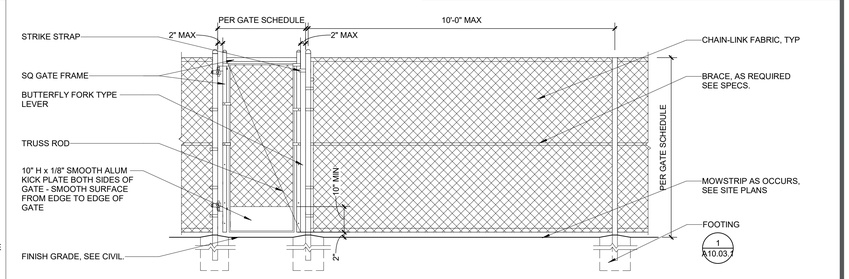


32.31.10.01

CHAIN-LINK FENCE & SWING GATE - PAIR 3
1/2" = 1'-0"

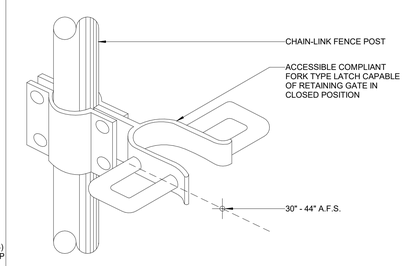


SINGLE C.L. GATE W/ PANIC HARDWARE 11
3/4" = 1'-0"



32.31.14.01

CHAIN-LINK FENCE & SWING GATE - SINGLE 2
1/2" = 1'-0"



32.31.09.01

CHAIN-LINK GATE FORK LATCH 6
NTS

FENCE POSTS (SIZES ARE MIN)

FENCE HEIGHT *	LINE POST	FTG. DIA. (d)	FTG. DEPTH (h)	TERM. POST	FTG. DIA. (d)	FTG. DEPTH
UP TO 4'	1 1/2 NPS	12"	36"	1 1/2 NPS	12"	36"
UP TO 6'	2 NPS	12"	42"	2 1/2 NPS	12"	42"
UP TO 8'	2 1/2 NPS	12"	48"	3 NPS	12"	48"

* W/O WINDSCREEN/SLATS,

** W/ REINFORCING

GATE POSTS (SIZES ARE MIN)

GATE WIDTH PER LEAF	GATE POST	FTG. DIA. (d)	FTG. DEPTH (h)	GATE HEIGHT
UP TO 6'	2 NPS	16" **	42"	UP TO 6'
UP TO 13'	3 1/2 NPS	16" **	42"	UP TO 8'

USE ROW OF GATE HEIGHT OR GATE WIDTH WHICHEVER IS THE GREATER

CHAIN-LINK FENCE & GATE POST CRITERIA 1
NTS

AGENCY APPROVAL:

LODI USD

HMC Architects
DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

LICENSED ARCHITECT
JENNIFER PEARSON HWANG
C-35691
REN. 05/31/25
STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
CHAIN LINK FENCE DETAILS

DSA SUBMITTAL

DATE: **2025-09-26**
CLIENT PROJ NO:

SHEET:
A10.03.1

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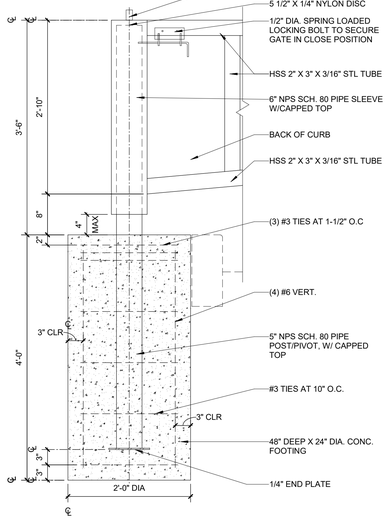
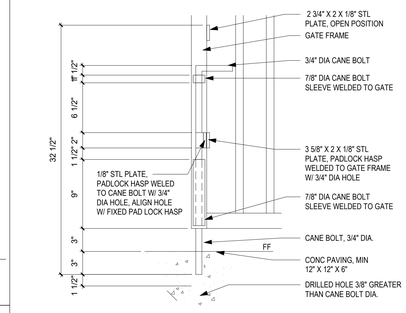


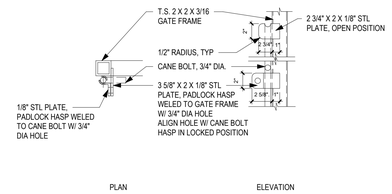
NOTES:
1. GRIND ALL WELDS SMOOTH
2. ALL WELDS ARE TO BE CONTINUOUS
3. PRIME STEEL COMPONENTS PRIOR TO INSTALLATION
4. ALL STEEL COMPONENTS TO BE PAINTED YELLOW

11.12.01.01

SWING ARM BARRIER GATE — 23
1" = 1'-0"

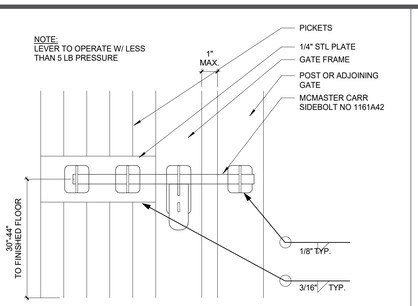


CANE BOLT ELEVATION

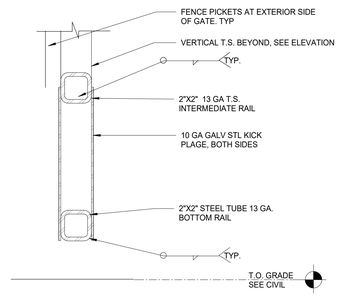


CANE BOLT HOLDER/ PADLOCK HASP

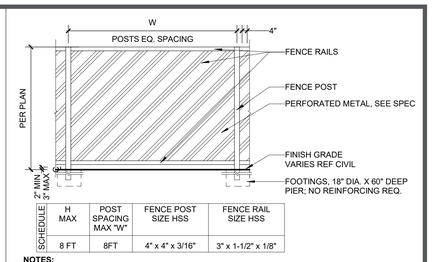
CANE BOLT DETAILS DECORATIVE METAL FENCE — 19
1 1/2" = 1'-0"



METAL GATE LATCH — 15
3" = 1'-0"



KICK PLATE — 10
3" = 1'-0"

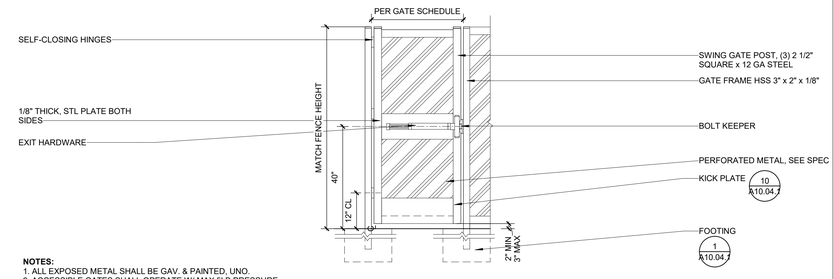


SCHEDULE	H MAX	POST SPACING MAX "W"	FENCE POST SIZE HSS	FENCE RAIL SIZE HSS
	8 FT	8FT	4" x 4" x 3/16"	3" x 1-1/2" x 1/8"

NOTES:
1. ALL EXPOSED METAL SHALL BE GALVANIZED FINISH.
2. STEP FENCE A POST AS REQ'D FOR SLOPED GRADE CONDITIONS.
3. SEE FENCES AND GATES METAL SPEC SECTION.

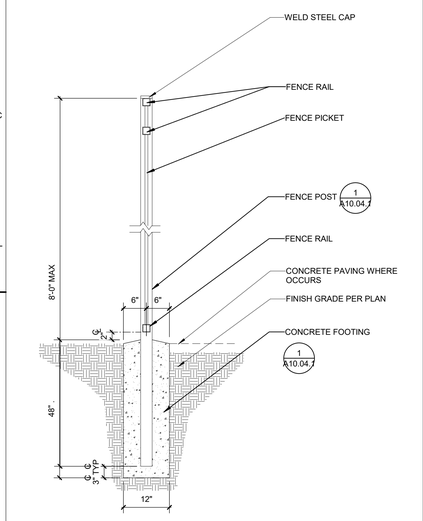
32.31.03.01

PERFORATED FENCE ELEVATION — 4
1/4" = 1'-0"



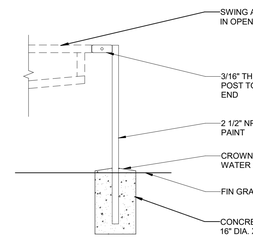
NOTES:
1. ALL EXPOSED METAL SHALL BE GAV. & PAINTED, UNO.
2. ACCESSIBLE GATES SHALL OPERATE W/ MAX 5LB PRESSURE

PERFORATED METAL EGRESS SWING GATE - SINGLE — 9
1/2" = 1'-0"



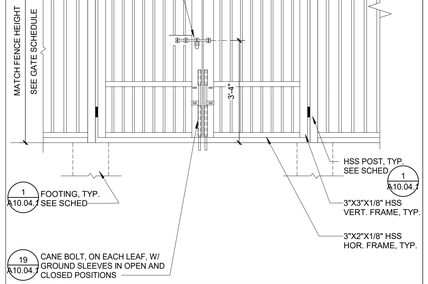
32.31.05.01

TYP. DECORATIVE FENCE SECTION — 3
3/4" = 1'-0"

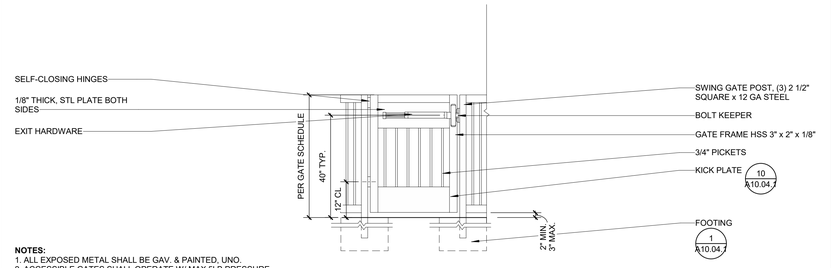


11.12.03.01

SWING ARM BARRIER GATE STOP POST - IN OPEN POSITION — 22
1/2" = 1'-0"

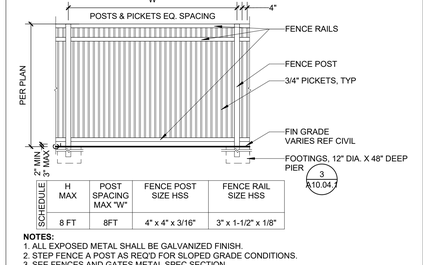


DECORATIVE METAL GATE - DOUBLE — 17
1/2" = 1'-0"



NOTES:
1. ALL EXPOSED METAL SHALL BE GAV. & PAINTED, UNO.
2. ACCESSIBLE GATES SHALL OPERATE W/ MAX 5LB PRESSURE

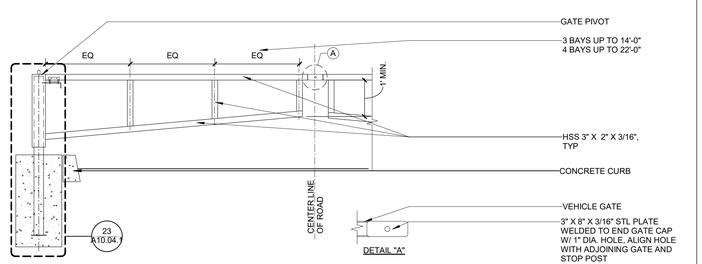
DECORATIVE METAL EGRESS SWING GATE - SINGLE — 7
1/2" = 1'-0"



SCHEDULE	H MAX	POST SPACING MAX "W"	FENCE POST SIZE HSS	FENCE RAIL SIZE HSS
	8 FT	8FT	4" x 4" x 3/16"	3" x 1-1/2" x 1/8"

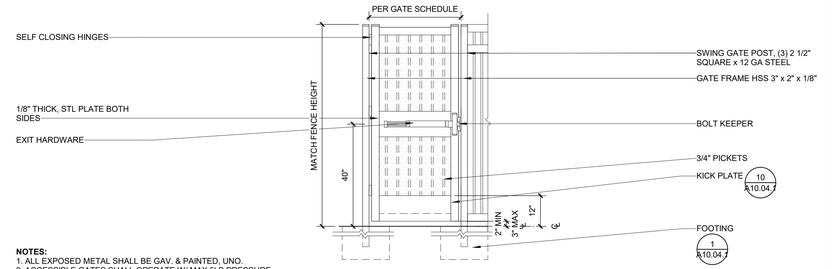
NOTES:
1. ALL EXPOSED METAL SHALL BE GALVANIZED FINISH.
2. STEP FENCE A POST AS REQ'D FOR SLOPED GRADE CONDITIONS.
3. SEE FENCES AND GATES METAL SPEC SECTION.

DECORATIVE FENCE ELEVATION — 2
1/4" = 1'-0"



11.12.02.01

SWING ARM BARRIER GATE ELEVATION — 16
3/8" = 1'-0"



NOTES:
1. ALL EXPOSED METAL SHALL BE GAV. & PAINTED, UNO.
2. ACCESSIBLE GATES SHALL OPERATE W/ MAX 5LB PRESSURE

DECORATIVE METAL EGRESS SWING GATE - SINGLE — 6
1/2" = 1'-0"

O.M. FENCE POSTS (SIZES ARE MIN)

FENCE HEIGHT	POST @ 8'-0" O.C	FTG. DIA. (d)	FTG. DEPTH (h)
UP TO 6'	2 1/2" x 12 ga	12"	42"
UP TO 8'	3" x 12 ga	16" **	48"
UP TO 10'	3" x 12 ga	16" **	60"

** W/ REINFORCING

GATE POSTS (SIZES ARE MIN)

GATE WIDTH (PER LEAF)	GATE POST	FTG. DIA. (d)	FTG. DEPTH (h)	GATE HEIGHT
UP TO 4'	4x4x1/4"	20" **	42"	UP TO 6'
UP TO 6'	4x4x1/4"	20" **	42"	UP TO 6'
UP TO 8'	4x4x1/4"	20" **	48"	UP TO 6'
UP TO 10'	6x6x3/16"	28" **	60"	UP TO 8'
UP TO 14'	6x6x3/16"	28" **	72"	UP TO 10'

USE ROW OF GATE HEIGHT OR GATE WIDTH WHICHEVER IS GREATER

32.31.04.01

DECORATIVE FENCE & GATE POST CRITERIA — 1
NTS

AGENCY APPROVAL:

LODI USD

HMC Architects
DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA. 95816
916 368 7990 / www.hmcarchitects.com
LICENSED ARCHITECT JENNIFER PEARSON HUANG C-35691 REN. 05/31/25 STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
DECORATIVE FENCE DETAILS

DSA SUBMITTAL

DATE: **2026-09-26** | CLIENT PROJ NO:

SHEET:

A10.04.1

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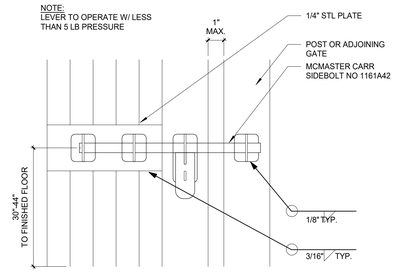
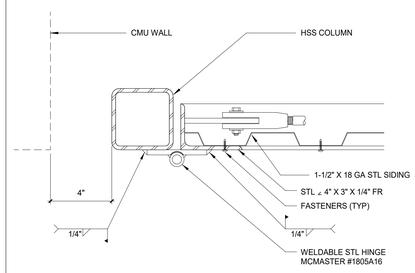
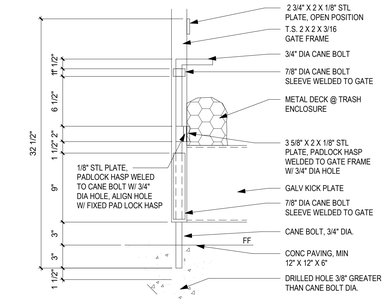
NOTE:
LEVER TO OPERATE W/ LESS THAN 5 LB PRESSURE



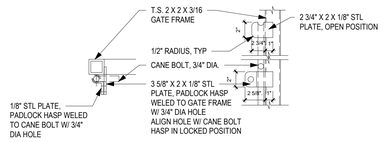
METAL GATE LATCH 5
3" = 1'-0"



HINGE AT METAL GATE 4
3" = 1'-0"

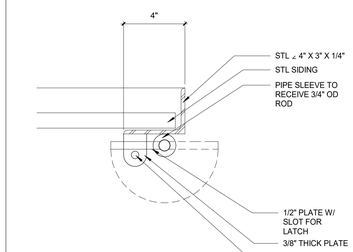


CANE BOLT ELEVATION

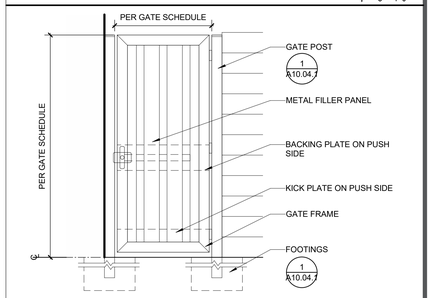


CANE BOLT HOLDER/ PADLOCK HASP

CANE BOLT DETAILS 7
1 1/2" = 1'-0"



CANE BOLT SECTION 3
3" = 1'-0"



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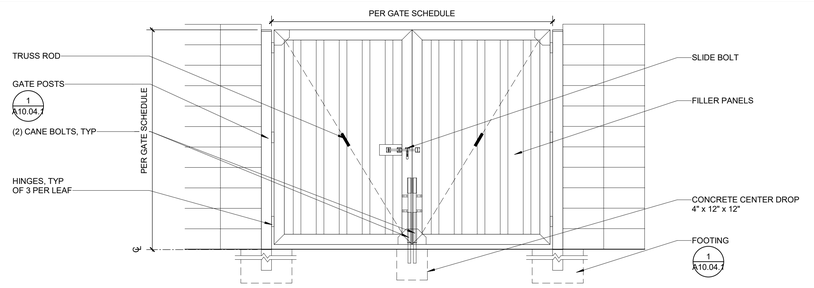
DECORATIVE METAL SECURITY SWING GATE - SINGLE 2
1/2" = 1'-0"



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DECORATIVE METAL SECURITY SWING GATE - PAIR 1
1/2" = 1'-0"

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AGENCY APPROVAL:

LODI USD

HMC DESIGN FOR GOOD Architects
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2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
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LICENSED ARCHITECT
JENNIFER PEARSON HWANG
C-35691
REN. 05/31/25
STATE OF CALIFORNIA

ISSUE

Δ	DESCRIPTION	DATE

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
TRASH ENCLOSURE DETAILS

DSA SUBMITTAL

DATE: **2026-09-26**
CLIENT PROJ NO:

SHEET:
A10.05.1

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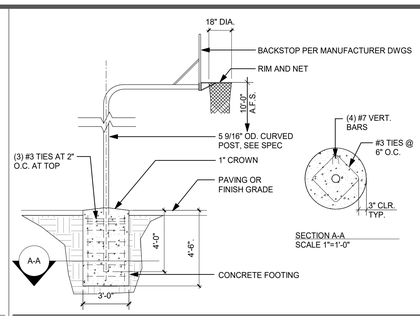
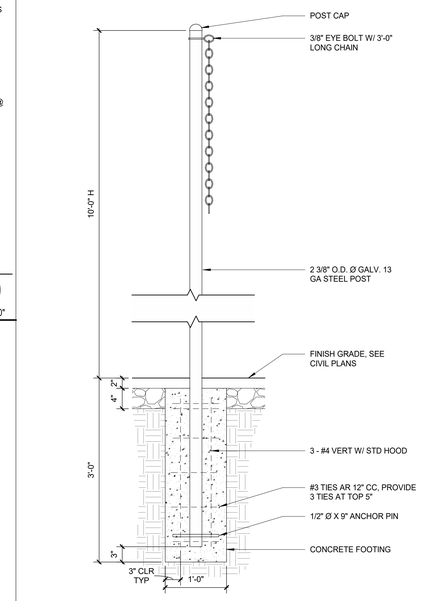
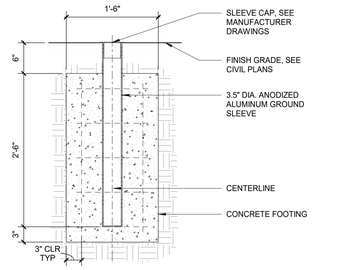


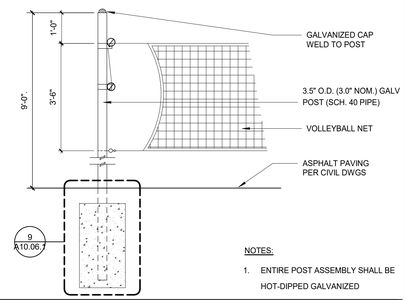
BASKETBALL BACKSTOP 10
1/4" = 1'-0"



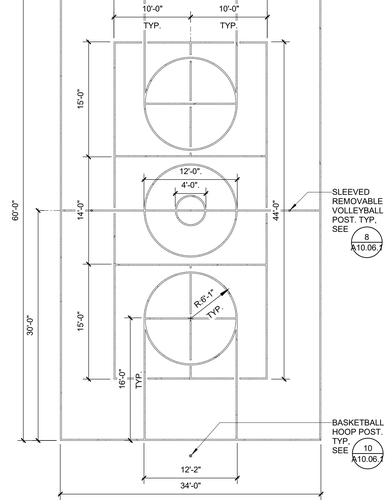


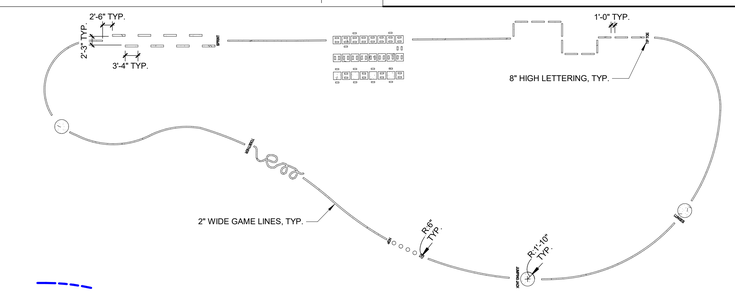
VOLLEYBALL POST SLEEVE 9
1" = 1'-0"

VOLLEYBALL POST SLEEVE 4
1" = 1'-0"



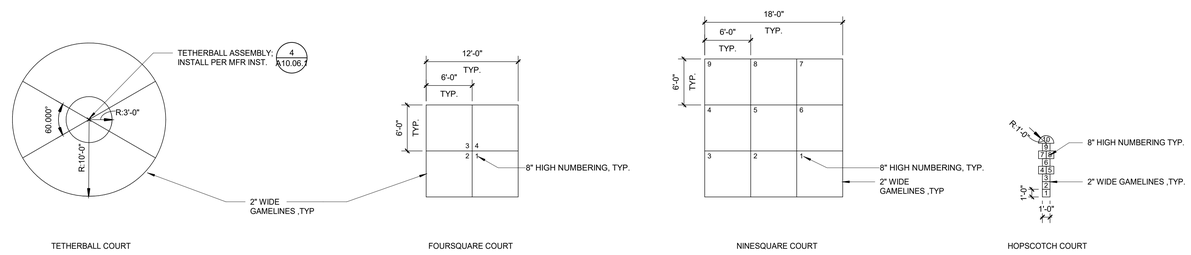
REMOVEABLE VOLLEYBALL POST 8
1/2" = 1'-0"





CHALLENG COURSE STRIPING 7
1/16" = 1'-0"

BASKETBALL AND VOLLEYBALL COURT STRIPING 2
1/8" = 1'-0"



NOTE:
1. MEASUREMENTS ARE TO CENTERLINE OF ALL GAME LINES

GAMELINE LAYOUT 1
1/8" = 1'-0"

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AGENCY APPROVAL:

LODI USD

HMC Architects
DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100, SACRAMENTO, CA. 95816
916 368 7990 / www.hmcarchitects.com

LICENSED ARCHITECT JENNIFER PEARSON-HAAG C-35691 REN. 05/31/25 STATE OF CALIFORNIA

ISSUE

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2801 W. VINE STREET
LODI, CA 95242

PROJECT:
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A10.06.1

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GENERAL NOTES

1. ALL DIMENSIONS, CONDITIONS AND ELEVATIONS ARE TO BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING WORK OR FABRICATION. IF ANY DISCREPANCIES ARE FOUND OR IF ANY CONDITION EXISTS NOT AS SHOWN ON THE DRAWINGS THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.

2. THE CONTRACTOR WILL HOLD HARMLESS, INDEMNIFY AND DEFEND THE OWNER, THE ENGINEER, AND HIS CONSULTANTS, AND EACH OF THEIR OFFICERS AND EMPLOYEES AND AGENTS, FROM ANY AND ALL LIABILITY CLAIMS, LOSSES OR DAMAGE ARISING OR ALLEGED TO ARISE FROM THE PERFORMANCE OF THE WORK DESCRIBED HEREIN, BUT NOT INCLUDING THE SOLE NEGLIGENCE OF THE OWNER, THE ENGINEER AND HIS CONSULTANTS, AND EACH OF THEIR OFFICERS AND EMPLOYEES AND AGENTS.

3. THE CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE DESIGN INTENT. UNLESS OTHERWISE SHOWN, THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND HE SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES.

IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR THE CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

ALL WORK SHALL CONFORM TO THE LATEST APPLICABLE CONSTRUCTION SAFETY REQUIREMENTS OF O.S.H.A. AND ANY OTHER GOVERNMENTAL ENTITY HAVING JURISDICTION.

4. THE DUTY OF THE ENGINEER TO CONDUCT CONSTRUCTION REVIEW OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, IN, ON, OR NEAR THE CONSTRUCTION SITE.

5. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER OR HIS REPRESENTATIVES DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER WHETHER OF MATERIAL OR WORK AND WHETHER PERFORMED PRIOR TO, DURING, OR AFTER COMPLETION OF CONSTRUCTION ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DRAWINGS AND SPECIFICATION, BUT THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.

6. ANY CHANGES TO THE APPROVED SET OF PLANS WITHOUT NOTIFYING THE ENGINEER PRIOR TO SUCH CHANGES ABSOLVES THE ENGINEER FROM ANY AND ALL RESPONSIBILITY WITH RESPECT TO LIABILITY, DAMAGE OR EXTRA WORK RESULTING FROM SAID CHANGES.

7. NOTES AND DETAILS ON THE DRAWINGS SHALL TAKE PRECEDENCE OVER THESE GENERAL NOTES.

8. THE TYPICAL DETAILS SHOWN ON THESE SHEETS SHALL APPLY IN ALL CASES UNLESS SPECIFICALLY SHOWN OTHERWISE. WHERE NO DETAIL IS SHOWN, CONSTRUCTION SHALL BE AS SHOWN FOR OTHER SIMILAR WORK.

9. DESIGN LOADS: RISK CATEGORY II OR RISK CATEGORY III
ROOF LIVE LOAD: 20 PSF REDUCIBLE. ROOF DEAD LOAD: 3 PSF
SNOW LOAD: P_g = P_S = 20 PSF & 30.5 PSF C_e = 1.1 C_t = 1.2 C_s = 1.0
I_s = 1.0 RISK CATEGORY II I_S = 1.1 RISK CATEGORY II ICE LOAD = 0 PSF

SEISMIC: I_E = 1.0 AT RISK CATEGORY II I_E = 1.25 AT RISK CATEGORY III

SEISMIC DESIGN CATEGORY = E ρ = 1.3 FOR OFFSET CONFIGURATION

STRUCTURE IS A STEEL ORDINARY CANTILEVERED COLUMN SYSTEM (02 PER ASCE7-16)
R = 1.25/0.7 (FOR WORKING STRESS)
C_D = 1.25 C_d = 1.25
SOIL SITE CLASS = D
FOR 12' COLUMN HEIGHT T = 0.361
FOR 14' COLUMN HEIGHT T = 0.45
FOR 16' COLUMN HEIGHT T = 0.497

BASE SHEAR: V = ρ x C_S x W
RISK CATEGORY II V = 0.728W (ASD) FOR S_{DS} = 1.0
LOW SEISMIC & RC III V=0.728W (ASD) FOR S_{DS}=0.9
RISK CATEGORY II V = 1.82W (ASD) FOR S_{DS} 2.5
HIGH SEISMIC & RC III V=1.82W (ASD) FOR S_{DS}=2.0

WIND LOAD: 107 MPH, EXPOSURE C RISK CATEGORY II OR RISK CATEGORY III
Kd = 0.85 Kz = 0.90 Kzt = 1.0Ke = 1.00

qh = 21.42 (qh = 0.00256 x Kz x Ke x Kzt x V^2 x 0.6 (FOR WORKING STRESS)). THE STRUCTURE IS DESIGNED FOR CLEAR & OBSTRUCTED WIND FLOWS.
MAXIMUM BASIC WIND LOAD FOR PROJECT LOCATED IN SPECIAL WIND REGIONS SHALL BE EQUAL TO OR LESS THAN 135 mph AND CONFORM WITH THE ADOPTED ORDINANCE OF THE CITY, COUNTY OR CITY AND COUNTY IN WHICH THE PROJECT SITE IS LOCATED AND SHALL BE APPROVED BY DSA-SS.

10. GOVERNING CODE: 2022 CBC

11. ALLOWABLE SOIL BEARING IS BASED ON 1500 PSF & 100 PCFx2 PASSIVE PRESSURE PER CBC TABLE 1806A.2 & SECTION 1806A.3.4. SKIN FRICTION IS PER 1810A.3.3.1.4 & IS EQUAL TO 1500/6=250 PSF. FOR UPLIFT SKIN FRICTION SHALL BE 125 PSF (S.F. OF 2). 1/3 INCREASE WAS NOT USED FOR ANY VALUES. TOP OF PIER IS ASSUMED TO MOVE ONE-HALF INCH.

12. ALL WORK TO BE PERFORMED UNDER THE CONTINUOUS INSPECTION OF A D.S.A. APPROVED INSPECTOR.

13. ALL WORK SHALL CONFORM TO TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR).

14. CHANGES TO THE APPROVED DRAWINGS AND SPECIFICATIONS SHALL BE MADE BY AN ADDENDA OR A CONSTRUCTION CHANGE DOCUMENT APPROVED BY THE DIVISION OF THE STATE ARCHITECT, AS REQUIRED BY SECTION 4-338, PART 1, TITLE 24, CCR AND THE ENGINEER.

15. A PROJECT INSPECTOR EMPLOYED BY THE DISTRICT (OWNER) AND APPROVED BY THE OFFICE OF THE STATE ARCHITECT SHALL PROVIDE CONTINUOUS INSPECTION OF THE WORK. THE DUTIES OF THE INSPECTOR ARE DEFINED IN SECTION 4-342, PART 1, TITLE 24, CCR.

CONCRETE NOTES

1. ALL MOLDS, ORNAMENTS, GROOVES, ETC. SHOWN ON THE ARCHITECTURAL DRAWINGS SHALL BE PROVIDED FOR IN THE FORM WORK BEFORE THE CONCRETE IS POURED.
2. ALL REINFORCING STEEL, ANCHOR BOLTS, DOWELS AND OTHER EMBEDS SHALL BE IN PLACE AND SECURED TO FORM WORK PRIOR TO POURING OF CONCRETE.
3. REFER TO BOTH ARCHITECTURAL AND MECHANICAL DRAWINGS FOR LOCATION OF PLUMBING FIXTURES.
4. NO PIPES OR DUCTS SHALL BE PLACED IN CONCRETE WALLS OR STRUCTURAL SLABS UNLESS SPECIFICALLY DETAILED.
5. CONSTRUCTION JOINTS NOT INDICATED ON THE DRAWINGS SHALL BE SO MADE AND LOCATED AS NOT TO IMPAIR THE STRENGTH OF THE STRUCTURE. PROVISION SHALL BE MADE FOR TRANSFER OF SHEAR AND OTHER FORCES THROUGHOUT THE JOINTS. THE CONTRACTOR SHALL OBTAIN THE ARCHITECTS APPROVAL OF CONSTRUCTION JOINT LOCATION IN ALL STRUCTURAL SLAB, BEAMS AND SHEAR WALLS.
6. SIDES OF FOOTINGS MAY BE POURED AGAINST STABLE EARTH.
7. THE QUALITY AND DESIGN OF CONCRETE SHALL COMPLY WITH TITLE 24 PART 2 EXCEPT ITEMS NOT SPECIFICALLY COVERED THEREIN SHALL CONFORM TO ACI 318.
8. ALL REINFORCING SHALL BE NEW STOCK DEFORMED BARS CONFORMING TO ASTM A615.

   A. #4 BARS AND SMALLER..... GRADE 40 OR 60
   B. #5 BARS AND LARGER.....GRADE 60
   C. SEPARATE BARS 1-1/2 DIAMETERS CLEAR OR 1-1/2" CLEAR, WHICHEVER IS LARGER.

9. MINIMUM CONCRETE COVER FOR REINFORCING SHALL BE AS FOLLOWS:
   CAST AGAINST EARTH (EXCEPT SLABS ON GRADE).....3"
   SLABS ON GRADE.....1-1/2"
   EXPOSED TO EARTH OR WEATHER
   #5 BARS AND SMALLER.....1-1/2"
   #6 BARS AND LARGER.....2"
   NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND
   SLABS, WALLS, JOISTS
   #11 BARS AND SMALLER.....3/4"
   #14 AND #18 BARS.....1-1/2"
   BEAMS, GIRDERS, COLUMNS
   PRINCIPAL REINFORCING, TIES
   STIRRUPS, OR SPIRALS.....1-1/2"
   SHELLS AND FOLDED PLATE MEMBERS
   #5 BARS AND SMALLER.....1/2"
   #6 BARS AND LARGER.....3/4"
10. CONCRETE SHALL HAVE FOLLOWING MINIMUM REQUIREMENTS FOR THE FOLLOWING EXPOSURE CATEGORIES AND CLASSES.
    F0- 3000 PSI AT 28 DAYS & MAXIMUM WATER TO CEMENT RATIO OF 0.5.
    F2- 4500 PSI AT 28 DAYS & MAXIMUM WATER TO CEMENT RATIO OF 0.45. VERIFY COMPLIANCE W/ ACI TABLE 19.3.3.1.
11. THE ENGINEER DOES NOT PROVIDE CONTRACT ADMINISTRATION FOR THE PROJECT, INCLUDING REVIEW OF CONCRETE MIXES.
12. PER ACI SECTION 19.3.2.1, FOOTING SHALL NOT BE EXPOSED TO FREEZING AND THAWING CYCLES, SHALL NOT BE EXPOSED TO WATER-SOLUBLE SULFATE IN SOIL BY PERCENT OF MASS 20.10%, SHALL NOT BE EXPOSED TO EXTERNAL SOURCE OF CHLORIDES.
13. CEMENT SHALL COMPLY W/ ASTM C150 AND AGGREGATE SHALL COMPLY W/ ASTM C33.

STRUCTURAL STEEL NOTES

1. ALL STRUCTURAL STEEL, EXCEPT W SHAPES SHALL CONFORM TO ASTM A-36 AND SHALL BE FABRICATED AND ERECTED AS PER AISC SPECIFICATIONS FOR BUILDINGS. W SHAPES SHALL CONFORM TO ASTM A992.
2. STRUCTURAL PIPE SHALL CONFORM TO ASTM A-53 GRADE "B" AND STRUCTURAL TUBING SHALL CONFORM TO ASTM A-500 GRADE "B". F_y=46KSI.
3. ALL LIGHT GAGE STEEL TO CONFORM TO ASTM A653 GRADE 55 FOR ALL STRUCTURAL SHAPES, A653 GRADE 33 FOR ALL BLOCKING, FLASHINGS, MISCELLANEOUS CONNECTION PLATES, AND ANGLES.
4. ALL UNFINISHED BOLTS SHALL BE ASTM A-307 UNLESS NOTED OTHERWISE.
5. USE AISC USUAL GAGES FOR BOLT HOLES IN ALL STEEL SECTIONS UNLESS OTHERWISE NOTED.
6. THE STEEL FABRICATOR SHALL PROVIDE ADEQUATE TEMPORARY BRACING FOR ERECTION.
7. ALL BOLT HOLES ARE TO BE 1/16" OVERSIZED, ALL BOLTS SHALL HAVE WASHERS INSTALLED UNDER BOTH HEAD & NUT. SELF DRILLING SCREWS SHALL BE PER ESR-1976 OR EQUAL.
8. ALL STEEL SHALL BE PROTECTED FROM WEATHER AS FOLLOWS: STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED (MIMIMUN ASTM A123 OR A153, CLASS D) OR PAINTED WITH ZINC-RICH PRIMER, UNDERCOAT, AND FINISH COAT; OR EQUIVALENT PAINT SYSTEM. COLD-FORMED STEEL MEMBERS SHALL BE 55% ALUMINUM-ZINC ALLOY COATED PER ASTM A792/A792M STANDARD IN ACCORDANCE TO AISI S200 TABLE A4-1, CF 50 COATING DESIGNATION.

   ALL EXPOSED STEEL FASTENERS, INCLUDING CAST-IN-PLACE ANCHOR BOLTS/RODS, SHALL BE STAINLESS STEEL (TYPE 304 MINIMUM). HOT-DIP GALVANIZED (ASTM A153, CLASS D MINIMUM), OR MECHANICALLY GALVANIZED (ASTM B695, CLASS 55 MINIMUM) AND SHALL BE PROTECTED WITH CORROSION-PREVENTIVE COATING THAT DEMONSTRATED NO MORE THAN 2% OF RED RUST ON MINIMUM 1,000 HOURS OF EXPOSURE IN SALT SPRAY TEST PER ASTM B117. ZINC-PLATED FASTENERS DO NOT COMPLY WITH THIS REQUIREMENT. (EXAMPLE PROPRIETARY COATINGS THAT DO COMPLY WITH THE 1,000 HOUR REQUIREMENT INCLUDE BUT ARE NOT NECESSARILY LIMITED TO: QUIK GUARD BY SIMPSON, KWIK-COTE BY HILTI, STALGARD BY ELCO, VISTACORR BY SFS INTEC, ETC.)

GOVERNING CODES:

1. 2022 CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE (PART 1, TITLE 24, CCR).
2. 2022 CALIFORNIA BUILDING CODE, VOLUMES 1 & 2 (PART 2, TITLE 24, CCR).
3. 2022 CALIFORNIA ELECTRICAL CODE (PART 3, TITLE 24, CCR).
4. 2022 CALIFORNIA FIRE CODE (PART 9, TITLE 24, CCR).

NOTES

1. COVERS ARE NOT DESIGNED TO BE ENCLOSED OR FOR STORAGE OF COMBUSTIBLE MATERIALS.
2. WALKWAY COVER HAS BEEN CHECKED FOR CLEAR & OBSTRUCTED WIND FLOW CONDITIONS & CAN BE WITHIN 6" MIN. FROM AN EXISTING BUILDING.
3. WALKWAY PIER FOOTING HAS BEEN CHECKED FOR D.S.A. BULLETIN 09-06 REV..
4. ALL WORK SHALL COMPLY WITH C.F.C. CHAPTER 33 DURING CONSTRUCTION.

TESTING & INSPECTIONS REQUIREMENTS

1. INSPECTOR CLASS (MINIMUM REQUIREMENTS)
   CLASS 2
2. SELECTION OF THE PROJECT INSPECTOR AND TESTING AGENCY
   BY THE SCHOOL DISTRICT AND APPROVED BY D.S.A., A/E OF RECORD AND STRUCTURAL ENGINEER
3. COST OF THE PROJECT INSPECTOR (CA ADMIN. CODE 4-333(B) AND TESTING AGENCY (CA ADMIN. CODE 4-335)
   BY THE SCHOOL DISTRICT
4. COPIES OF THE REPORT TO
   ARCHITECT; STRUCTURAL ENGINEER; SCHOOL DISTRICT; D.S.A. (ORIGINAL); IOR; MANUFACTURER

NOTICE OF DISCLAIMER FOR STRUCTURAL ENGINEERING RESPONSIBILITY

1. PER TITLE 24, PART 1, SECTION 4-316 (D & E) OF THE CALIFORNIA CODE OF REGULATIONS, THE DISTRICT SHALL HIRE AN ARCHITECT OR STRUCTURAL ENGINEER TO BE IN GENERAL RESPONSIBLE CHARGE OF SITE SPECIFIC PROJECT.
2. FOR SITE SPECIFIC PROJECT GERARD HOMER & ASSOCIATES IS NOT THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE.
3. FOR SITE SPECIFIC PROJECT GERARD HOMER & ASSOCIATES RESPONSIBILITY IS LIMITED TO THE PREPARATION OF PLANS AND SPECIFICATIONS FOR A PORTION OF THE PROJECT AS DESIGNED BY THE ARCHITECT FOR INCORPORATION INTO THE PROJECT.
4. STRUCTURAL OBSERVATION OF CONSTRUCTION IS SPECIFICALLY EXCLUDED FROM GERARD HOMER & ASSOCIATES RESPONSIBILITY FOR SITE SPECIFIC PROJECT.

NOTICE OF DISCLAIMER FOR STRUCTURAL ENGINEERING RESPONSIBILITY

5. ALL CONSTRUCTION ACTIVITIES RELATED TO STRUCTURAL ENGINEERING SHALL BE DELEGATED TO A QUALIFIED ENGINEER BY THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE. THESE ACTIVITIES INCLUDE, BUT ARE NOT LIMITED TO APPROVAL OF INSPECTOR QUALIFICATIONS, STRUCTURAL OBSERVATION OF CONSTRUCTION, REVIEW OF INSPECTION REPORTS, AND SIGNING OFF THE VERIFIED REPORTS FOR COMPLETED WORK. GERARD HOMER & ASSOCIATES SHALL NOT BE LISTED ON THE DSA 1 OR BE REQUIRED TO SIGN A DSA 1.DEL.
6. GERARD HOMER & ASSOCIATES WILL BE RESPONSIBLE FOR RESPONDING TO QUESTIONS PERTAINING TO THE PLANS AND SPECIFICATIONS FOR THE SHELTER OF THE PC WHICH ARISE DURING PLAN CHECK AND CONSTRUCTION.
7. THE ARCHITECT OR DSA SHALL NOT ADD TO OR CHANGE THIS PC WITHOUT PERMISSION FROM GERARD HOMER & ASSOCIATES.

SHADE STRUCTURE TESTING & INSPECTION GUIDELINE

THE DSA-103 GUIDELINES SHOWN ON THIS SHEET IS FOR ILLUSTRATION PURPOSES ONLY TO ASSIST IN THE COMPLETION OF FUTURE PROJECT-SPECIFIC FORM DSA-103. A FORM DSA-103 IS TO BE COMPLETED FOR EACH APPLICATION THAT THIS PC IS BEING INCORPORATED INTO AND THE EXAMPLE FORM DSA-103 IS TO BE CROSSED OUT ON THIS DRAWING.

DSA 103-22 LIST OF STRUCTURAL TESTS & SPECIAL INSPECTIONS – 2022 CBC

IMPORTANT: THIS FORM IS ONLY A SUMMARY LIST OF STRUCTURAL TESTS AND SOME OF THE SPECIAL INSPECTIONS REQUIRED FOR THE PROJECT. GENERALLY, THE STRUCTURAL TESTS AND INSPECTIONS NOTED ON THIS FORM ARE THOSE THAT WILL BE PERFORMED BY THE GEOTECHNICAL ENGINEER OF RECORD, LABORATORY OF RECORD, OR SPECIAL INSPECTOR. THE ACTUAL TESTING AND INSPECTION PROGRAM MUST BE PERFORMED AS DETAILED ON THE DSA APPROVED DOCUMENTS. THE APPENDIX AT THE BOTTOM OF THIS FORM IDENTIFIES WORK NOT SUBJECT TO DSA REQUIREMENTS. THE ACTUAL CONDITION OR STRUCTURAL TESTING. THE PROJECT INSPECTOR IS RESPONSIBLE FOR PROVIDING INSPECTION OF ALL FACETS OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO, SPECIAL INSPECTIONS NOT LISTED ON THIS FORM SUCH AS STRUCTURAL WOOD FRAMING, HIGH-LOAD WOOD DIAPHRAGMS, COLD-FORMED STEEL FRAMING, ANCHORAGE OF NON-STRUCTURAL COMPONENTS, ETC., PER TITLE 24, PART 2, CHAPTER 17A (2022 CBC).

**NOTE: UNDEFINED SECTION & TABLE REFERENCES FOUND IN THIS DOCUMENT ARE FROM THE CBC, OR CALIFORNIA BUILDING CODE.

NOTE: REFERENCES ARE TO THE 2022 EDITION OF THE CALIFORNIA BUILDING CODE (CBC) UNLESS OTHERWISE NOTED.

TEST OR SPECIAL INSPECTION
SOILS
S1. GENERAL:
a. VERIFY THAT: SITE HAS BEEN PREPARED PROPERLY PRIOR TO PLACEMENT OF CONTROLLED FILL AND/OR EXCAVATIONS FOR FOUNDATIONS. FOUNDATION EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL. MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.
S4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS);
a. INSPECT DRILLING OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH PIER.
b. VERIFY PIER LOCATIONS, DIAMETERS, PLUMBNESS & LENGTHS. RECORD CONCRETE OR GROUT VOLUMES.
c. CONCRETE PIERS
CONCRETE
C1. CAST IN PLACE CONCRETE
MATERIAL VERIFICATION AND TESTING:
a. VERIFY USE OF REQUIRED DESIGN MIX.
b. IDENTIFY, SAMPLE & TEST REINFORCING STEEL.
c. DURING CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, SLUMP & AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.
d. TEST CONCRETE (COMPRESSION), Fc
e. BATCH PLANT INSPECTION – PERIODIC, DESIGN COMPLIES WITH 1705A.3.3.1 ITEM 2.
STEEL
S/A1. STRUCTURAL STEEL, COLD-FORMED STEEL & ALUMINUM USED FOR STRUCTURAL PURPOSES
MATERIAL VERIFICATION & TESTING:
a. VERIFY IDENTIFICATION OF ALL MATERIALS AND: – MILL CERTIFICATES INDICATE MATERIAL PROPERTIES THAT COMPLY WITH REQUIREMENTS. – MATERIAL SIZES, TYPES AND GRADES COMPLY WITH REQUIREMENTS.
b. TEST UNIDENTIFIED MATERIALS
c. EXAMINE SEAM WELDS OF HSS SHAPES
INSPECTION:
d. VERIFY AND DOCUMENT STEEL FABRICATION PER DSA-APPROVED CONSTRUCTION DOCUMENTS.

SHEET INDEX

S1 FOUNDATION PLANS, GENERAL NOTES, DETAILS
S2 ROOF FRAMING PLANS
S3 SECTION, TYPICAL ELEVATION, DETAILS
S4 SECTION, DETAIL

BUILDING DATA

A-2 FOR LUNCH SHELTER
A-3 OCCUPANCY FOR GENERAL ASSEMBLY
II-B CONSTRUCTION
ALLOW. AREA = 6500 SQ.FT.
HEIGHT = 8'-0" MIN. TO 16'-0" MAX. COLUMN HEIGHT

REVISIONS

NO.	DATE	BY	DESCRIPTION

REGISTERED PROFESSIONAL ENGINEER GERARD HOMER S2373 EXP. 3-31-24 STATE OF CALIFORNIA

PRE-CHECK (PC) DOCUMENT
CODE: 2022 C.B.C.
A SEPARATE PROJECT APPLICATION FOR CONSTRUCTION IS REQUIRED.

PROJECT: SINGLE POST WALKWAY COVER
VALLEY SCHOOL SHELTERS

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-122747 PC
REVIEWED BY: SA
SS ☑ FLS ☐ ACCESS ☐ CRS ☐
DEPARTMENT OF GENERAL SERVICES
DATE: 9/1/2023

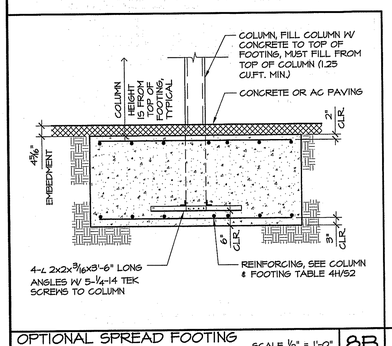
16765 SYPERT SCHOOL RD.
HOLLAND, TX. 76534
Gerard Homer and Associates
STRUCTURAL ENGINEERS
PH.: (559) 734-6675
Email: ghomerse@gmail.com

DWN BY: B.G.H. | CHKD BY: G.B.H.
DATE: 8/30/23
PROJECT NO: 23020 25D32 25165
DRAWING TITLE: FOUNDATION PLAN GENERAL NOTES DETAILS
SHEET NUMBER: S1
OF 4 SHEETS

GENERAL NOTES

NOTES FOR ACHITECT TO VERIFY & COMPLY

1. GRADING PLANS, DRAINAGE IMPROVEMENTS, ROAD AND ACCESS REQUIREMENTS AND ENVIRONMENTAL HEALTH CONSIDERATIONS SHALL COMPLY.
2. SUBSTITUTIONS AFFECTING DSA REGULATED ITEMS SHALL BE CONSIDERED AS A CONSTRUCTION CHANGE DOCUMENT OR ADDENDUM, AND SHALL BE APPROVED BY DSA PRIOR TO FABRICATION AND INSTALLATION PER DSA IR A-6 AND SECTION 338(C) PART 1, TITLE 24 CCR.
3. LOCATION OF ELECTRICAL COMPONENTS MOUNTED TO COLUMNS SHALL COMPLY WITH ASCE 24-14, SECTION 7.2.
4. THE ARCHITECT SHALL VERIFY COMPLIANCE W/ 80/5X (IR PC-7, SECTION 5.8) IF COVER IS NEAR A SLOPE AND NOTIFY THE P.C. ENGINEER. IF COVER IS NEAR A SLOPE, THE INSTALLATION OF THIS STRUCTURE SHALL NOT BE SUBMITTED AS 'OVER-THE-COUNTER.



OPTIONAL SPREAD FOOTING @ ADDITIONAL COST — SCALE ½" = 1'-0" — 8B

SHEET INDEX & STRUCTURAL TESTS AND INSPECTIONS SHEET — 4K

SITE SPECIFIC INFORMATION TABLE

0.643	SEISMIC COEFFICIENT, Sa			SELECT OCCUPANT LOAD FACTOR (OLF)	DETERMINATION OF BAY SPACING FOR COVER NEXT TO RISK CATEGORY III & S_{DS} > 2.0
0.264	SEISMIC COEFFICIENT, S1 ②	93	WIND SPEED (3 SEC. GUST) ❶ MPH	X ASSEMBLY–CONCENTRATED (7 SQ. FT./OCCUPANT)	
1.285	SEISMIC COEFFICIENT, Fa	C	WIND EXPOSURE CATEGORY	ASSEMBLY–NONCONCENTRATED (15 SQ. FT. /OCCUPANT)	25' BAYS x 2.0 ACTUAL S_{DS} x 1.25 = ☐ MAXIMUM BAY SPACING IN FEET **
2.072	SEISMIC COEFFICIENT, Fv	10	WIDTH OF COVER AREA IN FT.	58 DETERMINE OCCUPANT LOAD = AREA/OLF	
0.827	SEISMIC COEFFICIENT, Sms	40.5	LENGTH OF COVERED AREA IN FT.	DETERMINE RISK CATEGORY	** BAY SPACING ON PLAN VIEWS TO BE REVISED TO MATCH & USE HIGHER SEISMIC COLUMNS & FOOTINGS.
0.821	SEISMIC COEFFICIENT, Sm1 ①	4125	AREA IN SQ. FT.	X RISK CATEGORY II OCCUPANTS ≤ 300	
0.373	SITE SPECIFIC, Cs ③	2	NUMBER OF BAYS	RISK CATEGORY III OCCUPANTS > 300	
0.591	SEISMIC COEFFICIENT, Sds	16	MAXIMUM COLUMN HEIGHT IN FT.	RISK CATEGORY III ADJACENT TO RISK CATEGORY III BUILDING	
0.547	SEISMIC COEFFICIENT, Sd1	2:12	ROOF SLOPE IN./FT.	NOTE: DUE TO REDUNDANCY FACTOR THERE CAN BE NO REDUCTION IN S_{DS} PER ASCE 7-16 12.8.1.3 FOR COVERS.	

① FOR THE SITE CLASS D, Sm1 SHALL BE INCREASED BY 50% UNLESS A SITE SPECIFIC GROUND MOTION HAZARD ANALYSIS IS PERFORMED. Sms SHALL NOT BE LESS THAN Sm1.

② FOR SITE CLASS E WITH S1 GREATER THAN OR EQUAL TO 0.2, PROVIDED T IS LESS THAN OR EQUAL TO Ts, EQUATION 12.8-2 SHALL BE USED.

③ PER ASCE 7-16 EQUATION 12.8-2.

GEOHAZARD REPORTS			LIQUEFIABLE SOIL OR SITE CLASS F & E		
GEOHAZARD REPORT	X REQUIRED	NOT REQUIRED	LIQUEFIABLE SOILS	YES	X NO
GEOHAZARD REPORTS ARE NOT REQUIRED FOR CANTILEVERED COLUMN OPEN STRUCTURES PROVIDED THEY ARE CONSTRUCTED OF METAL, DO NOT EXCEED 4,000 SF. IN PLAN AREA AND ARE NOT LOCATED WITHIN STATE OR LOCAL GEOHAZARD ZONES. THE STRUCTURES MAY BE SPLIT INTO MULTIPLE SEISMICALLY SEPARATED STRUCTURES TO STAY BELOW THE 4,000 SF. TRIGGER.			IF STRUCTURE IS LOCATED IN AN AREA WITH LIQUEFIABLE SOIL OR SITE CLASS F & E, OVER-THE-COUNTER SUBMITTAL IS NOT ALLOWED AND REGULAR PROJECT SUBMITTAL IS REQUIRED. IF SITE IS NOT IN A MAPPED LIQUEFACTION HAZARD ZONE, IT MAY BE PRESUMED THAT NO LIQUEFACTION HAZARD EXISTS ON THAT SITE UNLESS A SITE-SPECIFIC GEOTECHNICAL REPORT IDENTIFIES SUCH HAZARD.		
X CONCRETE EXPOSURE F0		CONCRETE EXPOSURE F2*			

* F2 IS REQUIRED FOR ANY SNOW LOAD 30 PSF OR GREATER.

IF SITE SPECIFIC PROJECT IS LOCATED IN A FLOOD ZONE OTHER THAN X, A LETTER STAMPED AND SIGNED FROM A SOILS ENGINEER IS REQUIRED TO VALIDATE THE ALLOWABLE SOIL VALUES SPECIFIED ON THIS P.C., SEE GENERAL NOTES NUMBER II.

SINGLE POLE WALKWAY OPTIONS TABLE

LOADING	COLUMN HEIGHT	ROOF PANEL OPTION		PROJECTION
X 20 PSF LL	12' HEIGHT X	McELROY M59A-RIB		8'-0"
20 PSF SL	14' HEIGHT	AEP SPAN HR-36	X	10'-0"
30 PSF SL	X 16' HEIGHT	3 P.S.F.* MISC. DEAD LOAD		12'-0"
ROOF PITCH	COLUMN LOCATION	SEISMIC		14'-0"
X 2:12 MAX.	OFF-SET	LOWER *	YES	CONFIGURATION PER 6K/S4
4:12 MAX.	CENTERED	HIGHER **	X NO	"A" "B" "C" X "D"
		RC III S_{DS} > 2.0		

* R.C. II Sds ≤ 1.0 & R.C. III Sds ≤ 0.80

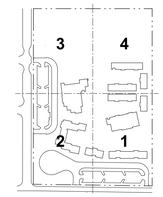
** R.C. II Sds ≤ 2.5 & R.C. III Sds ≤ 2.0

NOTES:
1. SEE 6HS/S8 FOR ROOF DECK PROFILES & SECTION PROPERTIES.
2. LIVE LOAD, LL = ROOF LIVE LOAD.
3. SNOW LOAD, SL = SNOW LOAD.
4. 3 P.S.F. MISC. DEAD LOAD NOT ALLOWED WITH SNOW LOAD. MISC. DEAD LOAD CAN INCLUDE SPRINKLERS OR SOLAR. BOTH ARE NOT ELIGIBLE FOR OVER THE COUNTER PLAN CHECK. LOADS CAN NOT BE SUPPORTED BY ROOF PANELS. ONLY THE BEAMS & PURLING CAN SUPPORT MISC. DEAD LOAD.
5. SEE SITE SPECIFIC TABLE.
6. FOR SNOW LOAD, IF THE HORIZONTAL SEPARATION DISTANCE BETWEEN ADJACENT STRUCTURES, X, IS LESS THAN 20 FT. (6.1 M) AND LESS THAN SIX TIMES THE VERTICAL SEPARATION DISTANCE (x=6h), THEN THE REQUIREMENTS FOR THE LEEWARD DRIFT OF SECTION 7.7.1 SHALL BE USED TO DETERMINE THE DRIFT LOAD ON THE LOWER STRUCTURE. IF THE SNOW DRIFT ANALYSIS IS REQUIRED IT SHALL BE PROVIDED BY THE PC APPLICANT & THE SITE APPLICATION IS NOT ELIGIBLE FOR OVER THE COUNTER SUBMITTAL.

OPTIONS TABLE & SITE SPECIFIC INFORMATION TABLE — 8K

NOTES

KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
FOUNDATION PLAN, GENERAL NOTES, DETAILS

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

S1

Autodesk Docs://3431010000 LODI USD SAMUEL M. GANTNER ES R24/3431010000-A-LUSD-GANTNER ES-SITE.rvt
12/8/2025 2:31:43 PM

PLEASE RECYCLE

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON FULL SIZE SHEETS (ORIGINAL PAGE SIZE)

COLUMN & FOOTING TABLE (NOTE 6)

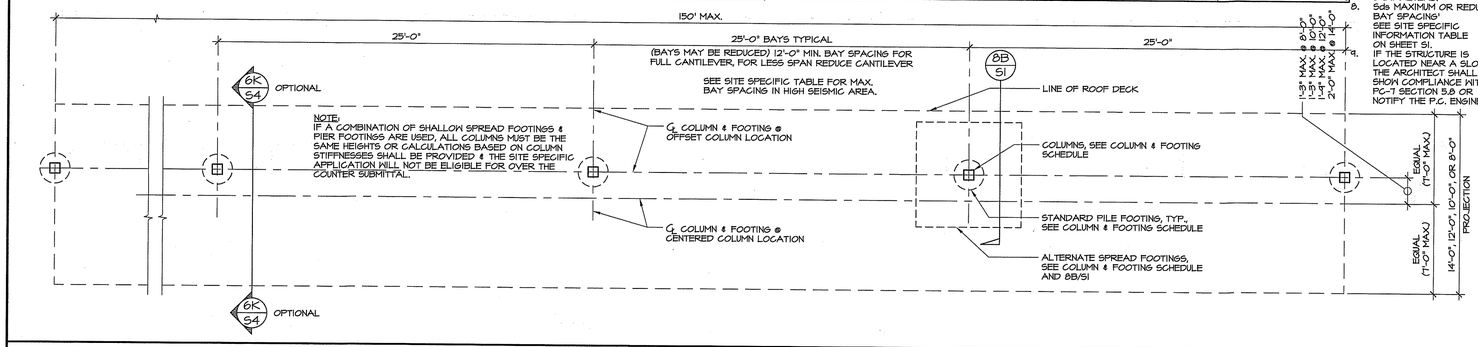
COLUMN HEIGHT	ROOF PITCH	LOAD	LOWER SEISMIC (S_{DS} ≤ 1.0 RISK CATEGORY II) (S_{DS} ≤ 0.8 RISK CATEGORY III) ≤ 12'–0" PROJECTION: COLUMN SIZE	PILE FOOTING	ALTERNATE SPREAD FOOTING (8B/S1) 1
12' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS6x6x¼	2'-0"Φx10'-3" DEEP	9'-3"SQ.x2'-6" THICK (4)
		30psf SL			
	4:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx12'-2" DEEP	9'-8"SQ.x2'-6" THICK (4)
		30psf SL			
14' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS6x6x¼	2'-0"Φx10'-8" DEEP	9'-8"SQ.x2'-6" THICK (4)
		30psf SL	HSS8x8x5/16		
	4:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx12'-6" DEEP	9'-10"SQ.x2'-6" THICK (4)
		30psf SL			
16' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS8x8x5/16	2'-0"Φx11'-0" DEEP	10'-0"SQ.x2'-6" THICK (4)
		30psf SL			
	4:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx12'-5" DEEP	10'-2"SQ.x2'-6" THICK (4)
		30psf SL			

COLUMN HEIGHT	ROOF PITCH	LOAD	LOWER SEISMIC (S_{DS} ≤ 1.0 RISK CATEGORY II) (S_{DS} ≤ 0.8 RISK CATEGORY III) ≤ 14'–0" PROJECTION: COLUMN SIZE	PILE FOOTING	ALTERNATE SPREAD FOOTING (8B/S1) 1
12' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx11'-9" DEEP	10'-4"SQ.x2'-6" THICK (4)
		30psf SL			
	4:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx13'-0" DEEP	10'-10"SQ.x2'-6" THICK (4)
		30psf SL			
14' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx12'-2" DEEP	10'-10"SQ.x2'-6" THICK (4)
		30psf SL			
	4:12 MAX.	20psf LL/SL	HSS10x8x3/8	2'-0"Φx13'-2" DEEP	11'-0"SQ.x2'-6" THICK (5)
		30psf SL			
16' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx12'-6" DEEP	11'-3"SQ.x2'-6" THICK (5)
		30psf SL			
	4:12 MAX.	20psf LL/SL	HSS10x8x3/8	2'-0"Φx13'-6" DEEP	
		30psf SL	HSS10x8x½		

COLUMN HEIGHT	ROOF PITCH	LOAD	HIGHER SEISMIC (S_{DS} ≤ 2.5 RISK CATEGORY II) (S_{DS} ≤ 2.0 RISK CATEGORY III) (8) ≤ 12'–0" PROJECTION: COLUMN SIZE	PILE FOOTING	ALTERNATE SPREAD FOOTING (8B/S1) 1
12' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS8x8x5/16	2'-0"Φx11'-10" DEEP	10'-6"SQ.x2'-6" THICK (4)
		30psf SL			
	4:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx12'-2" DEEP	
		30psf SL			
14' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS8x8x5/16	2'-0"Φx12'-3" DEEP	11'-0"SQ.x2'-6" THICK (5)
		30psf SL			
	4:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx12'-6" DEEP	
		30psf SL			
16' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx12'-8" DEEP	11'-4"SQ.x2'-6" THICK (5)
		30psf SL			
	4:12 MAX.	20psf LL/SL	HSS10x8x3/8	2'-0"Φx13'-2" DEEP	
		30psf SL	HSS10x8x½		

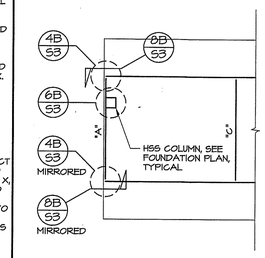
COLUMN HEIGHT	ROOF PITCH	LOAD	HIGHER SEISMIC (S_{DS} ≤ 2.5 RISK CATEGORY II) (S_{DS} ≤ 2.0 RISK CATEGORY III) (8) ≤ 14'–0" PROJECTION: COLUMN SIZE	PILE FOOTING	ALTERNATE SPREAD FOOTING (8B/S1) 1
12' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx13'-2" DEEP	11'-4"SQ.x2'-6" THICK (5)
		30psf SL			
	4:12 MAX.	20psf LL/SL	HSS10x8x3/8		
		30psf SL			
14' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx13'-6" DEEP	11'-10"SQ.x2'-6" THICK (5)
		30psf SL			
	4:12 MAX.	20psf LL/SL	HSS10x8x3/8		
		30psf SL	HSS10x8x½	2'-0"Φx14'-0" DEEP	12'-4"SQ.x2'-6" THICK (5)
16' COLUMN HEIGHT	2:12 MAX.	20psf LL/SL	HSS10x8x5/16	2'-0"Φx13'-10" DEEP	12'-4"SQ.x2'-6" THICK (5)
		30psf SL			
	4:12 MAX.	20psf LL/SL	HSS10x8x3/8		
		30psf SL	HSS10x8x½		

NOTES:
1. ALTERNATE SPREAD FOOTINGS ARE OPTIONAL FOOTINGS @ AN ADDITIONAL COST. NO SNOW LOAD ALLOWED W/ 3 P.S.F. MISC. DEAD LOAD.
2. COLUMN EMBEDMENT OF PILE FOOTING TO EXTEND INTO FOOTING 3"-6" MAX. FROM BOTTOM, SEE SECTION 6K/S3.
3. PROVIDE 8-#6 REBARS EACH WAY @ TOP & BOTTOM OF FOOTING.
4. PROVIDE 10-#6 REBARS EACH WAY @ TOP & BOTTOM OF FOOTING.
5. IF SITE SPECIFIC PROJECT IS LOCATED IN A FLOOD ZONE OTHER THAN ZONE X, A LETTER STAMPED AND SIGNED FROM A SOILS ENGINEER IS REQUIRED TO VALIDATE THE ALLOWABLE SOIL VALUES SPECIFIED ON THIS P.C., SEE GENERAL NOTES NUMBER 11.
6. MINIMUM PIER SPACING IS 3 DIAMETERS.
7. 5ds MAXIMUM OR REDUCE BAY SPACING' SEE SITE SPECIFIC INFORMATION TABLE ON SHEET S1.
8. IF THE STRUCTURE IS LOCATED NEAR A SLOPE, THE ARCHITECT SHALL SHOW COMPLIANCE WITH IR PC-1 SECTION 5.8 OR NOTIFY THE P.C. ENGINEER.
9. 1'-3" MAX @ 8'-0" 1'-9" MAX @ 10'-0" 2'-0" MAX @ 11'-0"

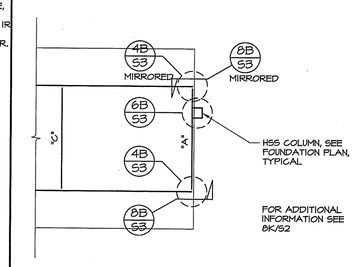


FOUNDATION PLAN

SCALE ¼" = 1'-0" 4H



PLAN @ UPPER ROOF WHERE STEP OCCURS

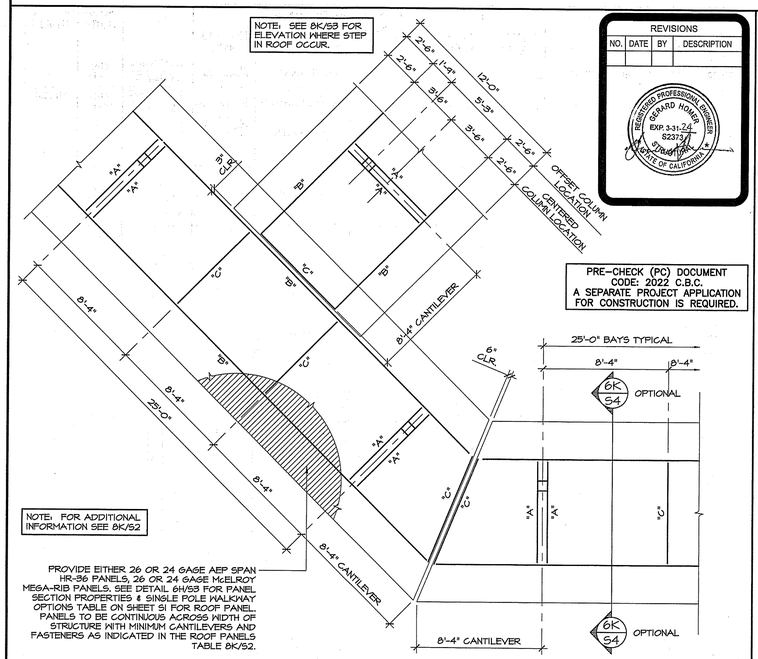


PLAN @ LOWER ROOF WHERE STEP OCCURS

ROOF FRAMING PLAN

SCALE ¼" = 1'-0" 4K

NOTE: SEE 8K/S3 FOR ELEVATION WHERE STEP IN ROOF OCCUR.



PRE-CHECK (PC) DOCUMENT
CODE: 2022 C.B.C.
A SEPARATE PROJECT APPLICATION FOR CONSTRUCTION IS REQUIRED.

NOTE: FOR ADDITIONAL INFORMATION SEE 8K/S2

PROVIDE EITHER 26 OR 24 GAGE AEP SPAN HR-36 PANELS, 26 OR 24 GAGE McELROY MEGA-RIB PANELS. SEE DETAIL 6H/S3 FOR PANEL SECTION PROPERTIES & SINGLE POLE WALKWAY OPTIONS TABLE ON SHEET S1 FOR ROOF PANEL. PANELS TO BE CONTINUOUS ACROSS WIDTH OF STRUCTURE WITH MINIMUM CANTILEVERS AND FASTENERS AS INDICATED IN THE ROOF PANELS TABLE 8K/S2.

ROOF FRAMING PLAN @ 45° OPTION

SCALE ¼" = 1'-0" 8B

ROOF PANEL TABLE (1, 3, 4, & 6)

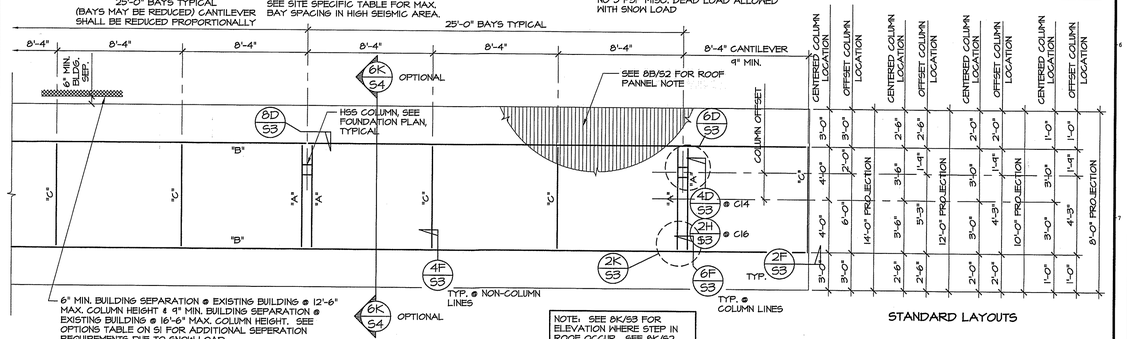
ROOF PITCH	LOAD	MINIMUM REQUIRED CANTILEVER LENGTHS @ 6'–0" CENTER SPAN (3)	MINIMUM REQUIRED CANTILEVER LENGTHS @ 7'–0" CENTER SPAN (3)	MINIMUM REQUIRED CANTILEVER LENGTHS @ 8'–0" CENTER SPAN (3) & (5)	SCREWS PER PANEL PER SUPPORT
2:12 MAX.	20psf LL/SL	NO CANTILEVER REQUIRED	1'-0" MIN.	0'-8" MIN.	(4)- #12-14x1" LONG W/ ½"Φ TWINSEAL WASHERS
	30psf SL		1'-6" MIN.	1'-6" MIN.	
4:12 MAX.	20psf LL/SL		1'-6" MIN.	1'-8" MIN.	(6)- #12-14x1" LONG W/ ½"Φ TWINSEAL WASHERS
	30psf SL		2'-0" MIN.	2'-0" MIN.	

1. SEE 8K/S1 FOR ROOF PANEL OPTIONS AND 6H/S3 FOR PROFILES & PROPERTIES.
2. ¼ IN 12 MINIMUM.
3. WHEN NOT USING STANDARD LAYOUTS SHOW ON ROOF FRAMING PLAN BELOW, THE ROOF PANELS MUST MEET THE MINIMUM REQUIRED CANTILEVER LENGTHS.
4. LENGTHS OF CANTILEVERS MUST BE EQUAL EACH SIDE, TYPICAL.
5. MUST USE 24 GAGE ROOF PANEL OPTIONS @ 8'-0" CENTER SPAN LAYOUT OPTION.
6. MAXIMUM ALLOWABLE CANTILEVER AT 24 GAGE ROOF PANELS IS 3'-0". IN NO CASE SHALL THE ROOF PANEL LENGTH EXCEED THE 14'-0" MAXIMUM ROOF PROJECTION.

BEAM TABLE

PITCH	PROJECTION	LOADING	COLUMN OFFSET	CROSS BEAM "A"	SIDE BEAM "B"	BLOCKING & END CLOSURES "C"
¼:12 MIN. 2:12 MAX.	≤ 12'-0"	20psf LL/SL	0'-0" TO 1'-4"	C14x2½x12 GAGE	C14x2½x12 GAGE	20 GAGE CEE W/ 1½" OR 2" FLANGES, DEPTH TO MATCH SIDE BEAM DEPTH, SEE 2F & 4F/S3
		30psf SL	0'-0" TO 1'-0"	C14x2½x12 GAGE	C18x2½x12 GAGE	
	> 12'-0", ≤ 14'-0"	20psf LL/SL	0'-0" TO 1'-4"	C14x2½x12 GAGE	C18x2½x12 GAGE	
			1'-10" TO 2'-0"	C16x3½x12 GAGE		
		30psf SL	0'-0" TO 1'-10"	C14x2½x12 GAGE	C18x2½x12 GAGE	
			0'-11" TO 1'-8"	C16x3½x12 GAGE		
			1'-9" TO 2'-0"	C16x3½x10 GAGE		
4:12 MAX.	≤ 12'-0"	20psf LL/SL	0'-0" TO 1'-4"	C14x2½x12 GAGE	C18x2½x12 GAGE	
		30psf SL	0'-0" TO 1'-4"	C14x2½x12 GAGE	C18x2½x12 GAGE	
	> 12'-0", ≤ 14'-0"	20psf LL/SL	0'-0" TO 1'-3"	C14x2½x12 GAGE	C18x2½x12 GAGE	
			1'-4" TO 2'-0"	C16x3½x12 GAGE		
			2'-0"	C16x3½x10 GAGE		
		30psf SL	0'-0" TO 0'-5"	C14x2½x12 GAGE	C18x2½x12 GAGE	
			0'-6" TO 1'-2"	C16x3½x12 GAGE		
			1'-3" TO 2'-0"	C16x3½x10 GAGE		

NO 3 PSF MISC. DEAD LOAD ALLOWED WITH SNOW LOAD



NOTE: SEE 8K/S3 FOR ELEVATION WHERE STEP IN ROOF OCCUR. SEE 8K/S2 WHERE NO STEP IS PROVIDED

STANDARD LAYOUTS

ROOF FRAMING PLANS

SCALE ¼" = 1'-0" 8K

REVISIONS

NO.	DATE	BY	DESCRIPTION

REGISTERED PROFESSIONAL ENGINEER GERARD HOWARD HOMER EXP. 3-31-24 S23732 STRUCTURAL STATE OF CALIFORNIA

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-121874 PC
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑ CES ☐
DEPARTMENT OF GENERAL SERVICES
DATE: 9/1/2023

Gerard Homer and Associates
STRUCTURAL ENGINEERS
16765 SYPERT SCHOOL RD.
HOLLAND, TX. 76534
PH.: (559) 734-8675
Email: ghomersei@gmail.com

DWN BY:	CHKD BY:
B.B.H.	G.B.H.

DATE: 8/30/23

PROJECT NO: 23020_25165

DRAWING TITLE
ROOF FRAMING PLANS

SHEET NUMBER
S2
OF 4 SHEETS

AGENCY APPROVAL:

LODI USD

HMC DESIGN FOR GOOD Architects
003431-010-000
2101 CAPITOL AVENUE, SUITE 100, SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

ISSUE

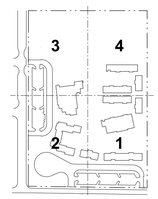
Δ	DESCRIPTION	DATE

PROJECT:
SINGLE POST WALKWAY COVER
VALLEY SCHOOL SHELTERS

KEYNOTES

NOTES

KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
ROOF FRAMING PLANS

DSA SUBMITTAL

DATE: 12/09/2025 | CLIENT PROJ NO:

SHEET:

S2

Autodesk Docs://S43101000 LOD USD SAMUEL M. GANTNER ES R24\S43101000-A-LUSD-GANTNER ES-SITE.rvt
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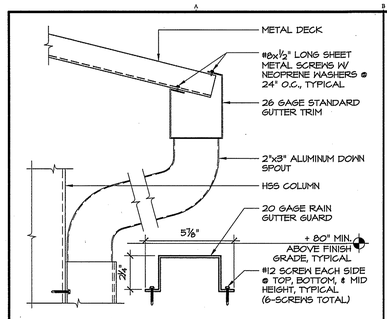
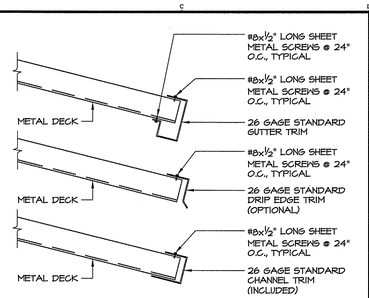
PLEASE RECYCLE

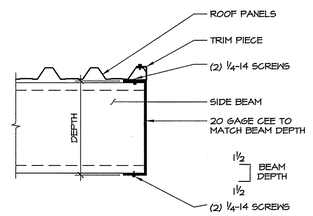
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ANSI SHEETS ORIGINAL PAGE SIZE



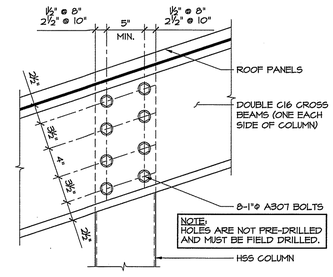
BOX GUTTER SCALE 3" = 1'-0" 2B



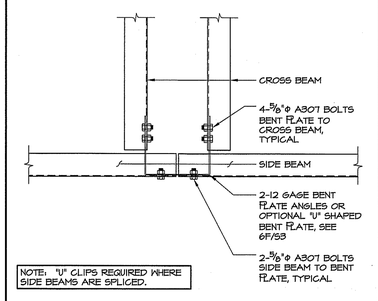
FASCIA OPTIONS SCALE 3" = 1'-0" 2D



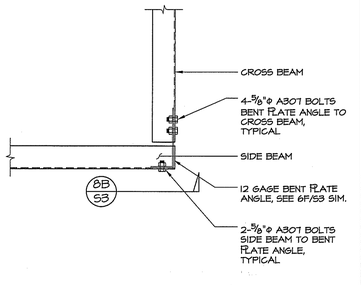
BEAM END SCALE 1½" = 1'-0" 2F



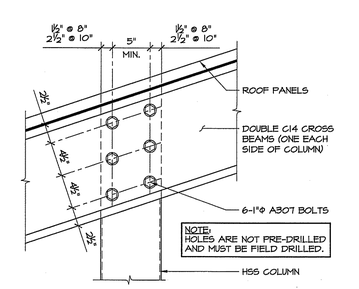
16" CROSS BEAM TO COLUMN SCALE 1½" = 1'-0" 2H



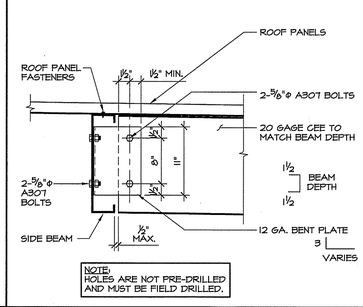
SIDE BEAMS TO CROSS BEAMS SCALE 1½" = 1'-0" 2K



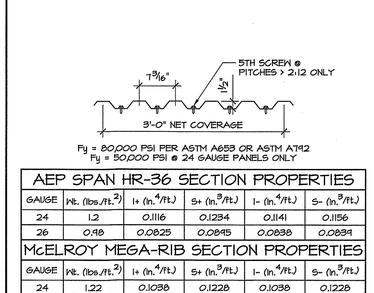
BEAM TO BEAM SCALE 1½" = 1'-0" 4B



14" CROSS BEAM TO COLUMN SCALE 1½" = 1'-0" 4D



BRACE TO BEAM SCALE 1½" = 1'-0" 4F



Fy = 80,000 PSI PER ASTM A653 OR ASTM A792
Fy = 50,000 PSI @ 24 GAUGE PANELS ONLY

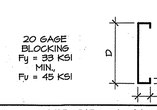
AEP SPAN HR-36 SECTION PROPERTIES

GAUGE	Wt. (lbs./ft.²)	I+ (in.⁴/ft.)	S+ (in.³/ft.)	I- (in.⁴/ft.)	S- (in.³/ft.)
24	1.2	0.1116	0.1234	0.1141	0.1156
26	0.98	0.0825	0.0845	0.0838	0.0834

McELROY MEGA-RIB SECTION PROPERTIES

GAUGE	Wt. (lbs./ft.²)	I+ (in.⁴/ft.)	S+ (in.³/ft.)	I- (in.⁴/ft.)	S- (in.³/ft.)
24	1.22	0.1038	0.1228	0.1038	0.1228
26	0.98	0.0761	0.0841	0.0761	0.0841

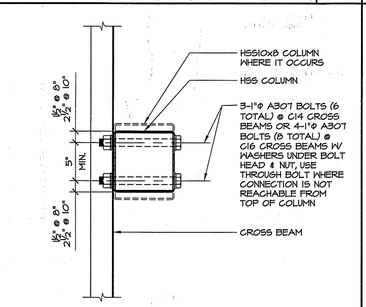
SECTION PROPERTIES ARE EFFECTIVE SECTION PROPERTIES TYP.



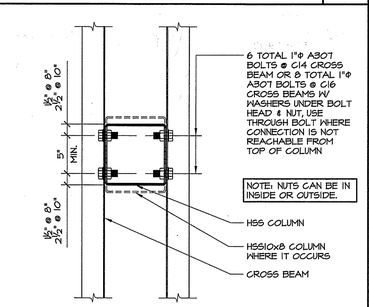
CEE SECTION PROPERTIES

SECTION DxB	GAGE	WEIGHT lb/ft.	Ag in.²	AXIS X-X Ix in.⁴	AXIS X-X Sx in.³	AXIS Y-Y Iy in.⁴	AXIS Y-Y Sy in.³	L in.
C14x1½	20	2.05	0.117	7.093	0.742	0.068	0.05	-
C14x2½	12	7.14	1.14	53.354	7.622	1.414	0.715	0.916
C16x1½	20	2.29	0.1172	9.492	0.853	0.064	0.051	-
C16x3½	10	11.02	1.8	112.26	13.517	4.32	1.582	0.989
C18x2½	10	10.59	1.619	118.0	12.283	1.84	0.847	0.916
C18x1½	20	2.54	0.1174	12.261	0.964	0.07	0.051	-
C18x2½	12	8.57	1.149	100.08	9.8	1.49	0.725	0.916

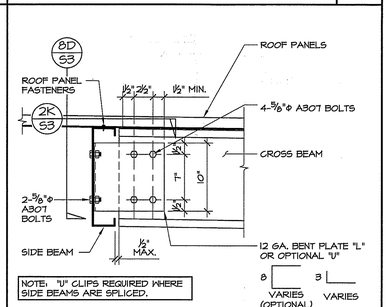
MATERIAL PROPERTIES SCHEDULES 6H



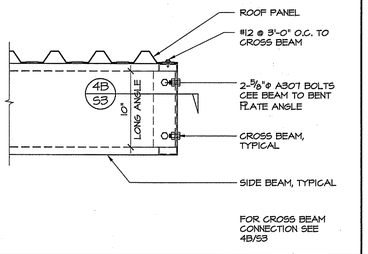
BEAM TO COLUMN SCALE 1½" = 1'-0" 6B



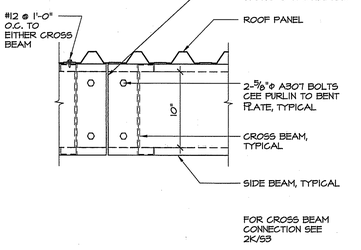
BEAM TO COLUMN SCALE 1½" = 1'-0" 6D



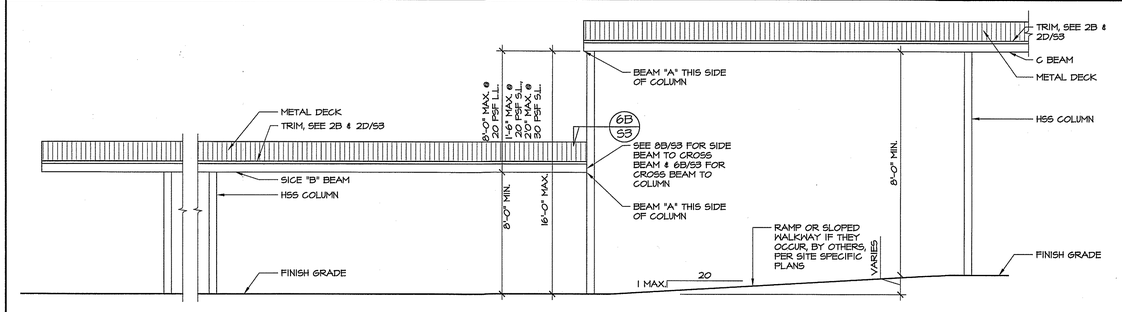
BEAM TO BEAM SCALE 1½" = 1'-0" 6F



BEAM TO BEAM SCALE 1½" = 1'-0" 8B



SIDE BEAM SPLICE SCALE 1½" = 1'-0" 8D



ELEVATION SCALE ¼" = 1'-0" 8K

REVISIONS

NO.	DATE	BY	DESCRIPTION

REGISTERED PROFESSIONAL ENGINEER GERARD HOMER EXP. 3-31-24 S2373 STRUCTURAL STATE OF CALIFORNIA

PRE-CHECK (PC) DOCUMENT
CODE: 2022 C.B.C.
A SEPARATE PROJECT APPLICATION FOR CONSTRUCTION IS REQUIRED.

PROJECT: SINGLE POST WALKWAY COVER VALLEY SCHOOL SHELTERS

AGENCY APPROVAL:

LODI USD

HMC Architects DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100, SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

ISSUE

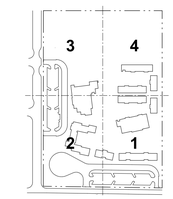
Δ	DESCRIPTION	DATE

KEYNOTES

NOTES

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-121474-PC
REVIEWED FOR
SS ☑ FLS ☑ MS ☐ ACS ☑ CS ☐
DEPARTMENT OF GENERAL SERVICES
DATE: 9/1/2023

KEY PLAN



Gerard Homer and Associates
STRUCTURAL ENGINEERS
16765 SYPERT SCHOOL RD.
HOLLAND, TX. 76534
PH.: (559) 734-6675
Email: ghomerse@gmail.com

DWN BY: B.G.H. | CHKD BY: G.B.H.
DATE: 8/30/23
PROJECT NO: 23020
DRAWING TITLE
SECTION TYPICAL ELEVATION DETAILS
SHEET NUMBER S3 OF 4 SHEETS

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
SECTION, TYPICAL ELEVATION, DETAILS

DSA SUBMITTAL

DATE: 12/09/2025 | CLIENT PROJ NO:

SHEET:

S3

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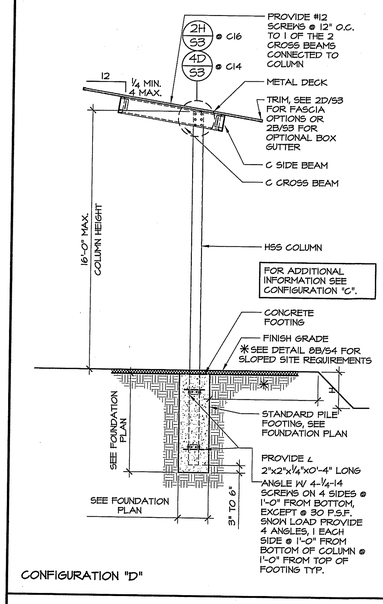
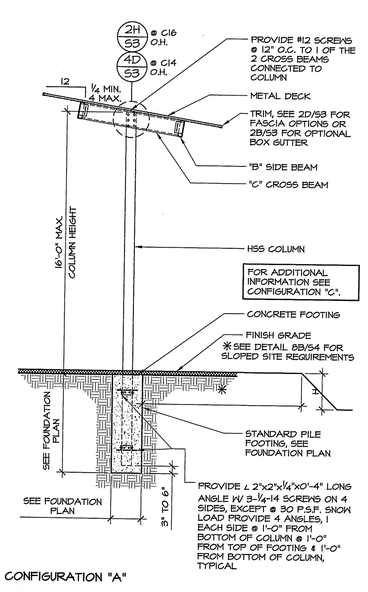
PLEASE RECYCLE

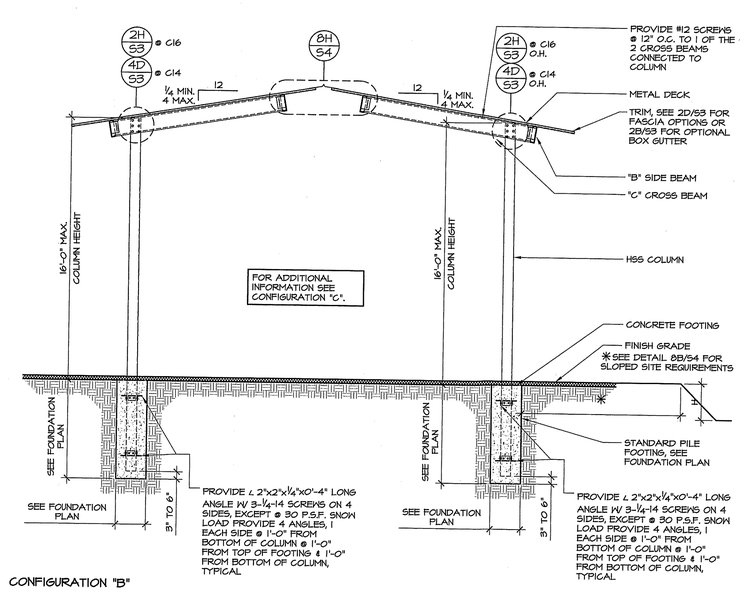
THE LINE SHOWN ABOVE IS EXACTLY 3" WHEN PRINTED ON ARCH D SHEETS (ORIGINAL PAGE SIZE)



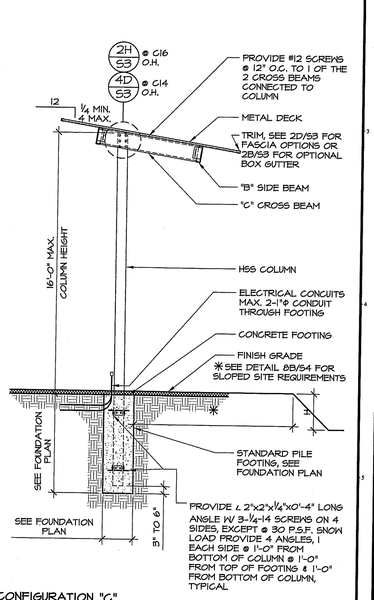
CONFIGURATION "D"



CONFIGURATION "A"



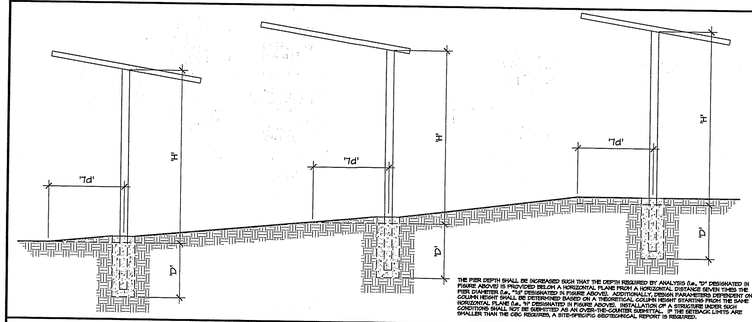
CONFIGURATION "B"



CONFIGURATION "C"

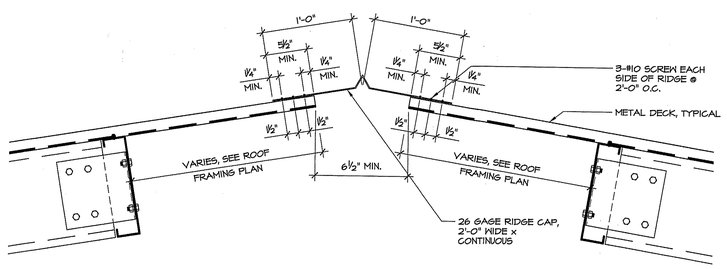
SCALE ¼" = 1'-0" 6K

SECTIONS



THE PIER DEPTH SHALL BE INCREASED EACH YEAR THE DEPTH REQUIRED BY ANALYSIS (i.e., "D" DESIGNATED IN FIGURE ABOVE) IS PROVIDED BELOW A HORIZONTAL PLANE FROM A HORIZONTAL DISTANCE SEVEN TIMES THE PIER DIAMETERS (i.e., "H" DESIGNATED IN FIGURE ABOVE) ACROSS THE DESIGN PARAMETERS DEPENDENT ON COLUMN HEIGHT SHALL BE DETERMINED BASED ON A THEORETICAL COLUMN FIXED AT THE HORIZONTAL PLANE (i.e., "H" DESIGNATED IN FIGURE ABOVE). INSTALLATION OF A STRUCTURE UNDER SUCH CONDITIONS SHALL NOT BE SUBMITTED AS AN OVER-THE-COUNTER SUBMITTAL. IF THE SETBACK LIMITS ARE SMALLER THAN THE CBC REQUIRES, A SITE-SPECIFIC GEOTECHNICAL REPORT IS REQUIRED.

SLOPED SITE FIGURE — SCALE ¼" = 1'-0" 8D



RIDGE CAP — SCALE 1½" = 1'-0" 8H

PRE-CHECK (PC) DOCUMENT
CODE: 2022 C.B.C.
A SEPARATE PROJECT APPLICATION FOR CONSTRUCTION IS REQUIRED.

8K

REVISIONS

NO.	DATE	BY	DESCRIPTION

REGISTERED PROFESSIONAL ENGINEER — GERARD HOMER — EXP. 3-31-24 — S23737 — STATE OF CALIFORNIA

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-121374 PC
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SS ☑ FLS ☑ ACS ☐ CS ☐
DATE: 9/1/2023

16765 SYPERT SCHOOL RD.
HOLLAND, TX. 76534
PH.: (559) 734-6875
Email: ghomersse@gmail.com
Gerard Homer and Associates
STRUCTURAL ENGINEERS

DWN BY: B.S.H. | CHKD BY: G.B.H.
DATE: 8/30/23
PROJECT NO: 23020 25165
DRAWING TITLE
SECTION
TYPICAL ELEVATION
DETAILS
SHEET NUMBER
S4
OF 4 SHEETS

PROJECT:
SINGLE POST WALKWAY COVER
VALLEY SCHOOL SHELTERS

AGENCY APPROVAL:

LODI USD

HMC Architects
DESIGN FOR GOOD
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916.368.7990 / www.hmcarchitects.com

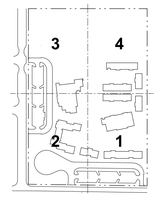
ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

NOTES

KEY PLAN



FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W. VINE STREET
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC. 1

SHEET NAME:
SECTION, TYPICAL ELEVATION, DETAILS

DSA SUBMITTAL

DATE: 12/09/2025 | CLIENT PROJ NO:

SHEET:
S4

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PLEASE RECYCLE

IF THE LINE BROWN ABOVE IS NOT 1" LONG THEN DRAWING IS NOT TO SCALE ORIGINAL SHEET SIZE

ELECTRICAL GENERAL NOTES

1) ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH THE FOLLOWING CODES AS AMENDED AND ADOPTED BY THE AUTHORITY(IES) HAVING JURISDICTION: 2022 CALIFORNIA ADMINISTRATIVE CODE (CAC), 2022 CALIFORNIA BUILDING CODE (CBC), 2022 CALIFORNIA FIRE CODE (CFC), 2022 CALIFORNIA MECHANICAL CODE (CMC), 2022 CALIFORNIA PLUMBING CODE (CPC), 2022 CALIFORNIA ELECTRICAL CODE (CEC), 2022 CALIFORNIA ENERGY CODE (CENC), 2022 CALIFORNIA GREEN BUILDING CODE (CGC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA), AND ANY OTHER LOCAL CODES, ORDINANCES, REGULATIONS, OR AUTHORITIES HAVING JURISDICTION. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR OTHER CODES AND REGULATIONS APPLICABLE TO THIS PROJECT. THESE CODES SHALL DETERMINE MINIMUM REQUIREMENTS FOR MATERIALS, METHODS, AND LABOR PRACTICES NOT OTHERWISE DEFINED IN THESE SPECIFICATIONS.

2) CEC AND MAXIMUM VOLTAGE DROP OF 5% WILL DEFINE CONDUCTOR SIZING.

3) ALL CONDUCTORS SHALL BE IN CONDUITS, U.O.N. CONDUITS SHALL BE USED IN THE FOLLOWING METHODS:
   - POLYVINYL CHLORIDE (PVC) CONDUITS ALLOWED FOR UNDERGROUND OTHERWISE PROVIDE RMC OR IMC, INSTALL PER CEC TABLE 300.5 BURIAL DEPTH REQUIREMENTS
   - ELECTRICAL METALLIC TUBING (EMT) WITH COMPRESSION FITTINGS MAY BE USED IN OR ON WALLS OR CEILINGS WHERE NOT SUBJECT TO MECHANICAL DAMAGE, DAMP CONDITIONS OR CORROSIVE CONDITIONS;
   - LIQUID TIGHT FLEXIBLE METAL CONDUIT WHERE REQUIRED;
   - FLEXIBLE METALLIC CONDUIT, WHERE REQUIRED BY CEC, IN DRY LOCATIONS. NOTE: ALL CONDUITS IN HAZARDOUS LOCATIONS (PER CEC) SHALL MEET THE REQUIREMENTS OF CEC CHAPTER 5.
   - CONNECTION TO LIGHT FIXTURES ABOVE LAY-IN CEILING MAY USE 3/8" FLEXIBLE METAL CONDUIT PER CEC 348.20(A)(2)
   - ALL EXPOSED CONDUIT SUBJECT TO WEAR OR COLLISION SHALL BE RIGID GALVANIZED STEEL (RGS) OR INTERMEDIATE METALLIC TUBING (IMT). APPLY BITUMASTIC COATING TO ALL METALLIC CONDUITS IN SLABS OR UNDERGROUND.
   - PROVIDE FIRE RETARDANT U.L. APPROVED SEALANT ON ALL RACEWAY PENETRATIONS OF FIRE RATED CEILINGS, PARTITIONS, WALLS AND STRUCTURAL SLABS.

4) FOR TELEPHONE SYSTEM: PROVIDE GROUNDING FOR ALL TELEPHONE BACKBOARDS, TERMINAL CABINETS AND EQUIPMENT PER REQUIREMENTS OF CEC 800 AND TELEPHONE COMPANY.

5) ALL EQUIPMENT SHALL BE PROVIDED WITH AN APPROVED DISCONNECTING MEANS PER CEC. ALL DISCONNECT SWITCHES SHALL BE SIZED PER CEC TO ACCOMMODATE EQUIPMENT SERVED, INCLUDING REQUIRED FUSES, U.O.N. SWITCHES SHALL BE HORSE POWER RATED, OF HEAVY DUTY TYPE. PROVIDE MEANS FOR PAD LOCKING IN THE OPEN POSITION.

6) ALL CIRCUIT BREAKERS SHALL BE INVERSE TIME (THERMAL MAGNETIC) "PERMANENT TRIP" TYPE. TWO AND THREE POLE CIRCUIT BREAKERS SHALL BE COMMON TRIP.

7) ALL CONNECTIONS TO GROUND RODS AND GRID, ETC., SHALL BE MADE WITH U.L. APPROVED WELDED CONNECTIONS, UNLESS NOTED OTHERWISE.

8) LIGHTING SYSTEMS SHALL COMPLY WITH CENC. ALL LIGHTING FIXTURES, LAMPS, BALLASTS, DIMMER SWITCHES, AND CONTROLS SHALL BE CERTIFIED WITH THE CALIFORNIA ENERGY COMMISSION AS MEETING ALL CENC REQUIREMENTS AND BE LISTED IN THE APPLICABLE ENERGY COMMISSION DIRECTORY. ALL SUCH DEVICES AND EQUIPMENT SHALL BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS. LIGHT FIXTURES IN SUSPENDED CEILINGS SHALL BE SUPPORTED IN STRICT ACCORDANCE WITH CBC SEISMIC REQUIREMENTS.

9) LIGHT POLLUTION REDUCTION: OUTDOOR LIGHTING SYSTEMS SHALL BE INSTALLED TO COMPLY WITH CENC. CGC, OR LOCAL JURISDICTION ORDINANCE, WHICHEVER IS MORE STRINGENT.

10) ALL ELECTRICAL EQUIPMENT, DEVICES, WIRE, ETC., SHALL BE LISTED, FOR THE INTENDED USE, WITH UNDERWRITER'S LABORATORIES, INC., (UL), WHERE STANDARDS HAVE BEEN ESTABLISHED BY UL. ALL EQUIPMENT SHALL BE RAIN TIGHT WHERE EXPOSED TO THE WEATHER. ALL FLEX CONDUITS CONNECTED TO SUCH EQUIPMENT SHALL BE METALLIC LIQUID TIGHT. ALL EQUIPMENT IN HAZARDOUS LOCATIONS, PER CEC., CHAPTER 5, SHALL BE IN ACCORDANCE WITH THE CEC. ALL EQUIPMENT IN CORROSIVE ENVIRONMENTS SHALL BE IN ENCLOSURES (SUCH AS NEMA 4X) RATED FOR THE ENVIRONMENT.

11) RECEPTACLES AND SWITCHES INTENDED TO BE ACCESSIBLE TO THE PUBLIC SHALL BE INSTALLED IN ACCORDANCE WITH CBC 11B-308. INSTALLATION HEIGHT ABOVE FINISHED FLOOR OR GROUND SHALL BE AS FOLLOWS: TOP OF UNOBSTRUCTED OUTLET BOXES SHALL BE NO MORE THAN 48 INCHES, BOTTOM OF UNOBSTRUCTED OUTLET BOXES SHALL BE NO LESS THAN 15 INCHES, ETC.

12) UTILITY SERVICE AND REQUIREMENTS SHALL BE COORDINATED WITH POWER SERVICE WITH POWER COMPANY; PROVIDE FOR ALL STANDARD POWER COMPANY REQUIREMENTS. FAULT CURRENT RATINGS SHALL BE PROVIDED BY UTILITY.

13) THE LAYOUTS OF THE CONTRACT DRAWINGS ARE DIAGRAMMATIC. IT IS NOT INTENDED TO SHOW EVERY OFFSET AND FITTING, NOR EVERY STRUCTURAL DIFFICULTY THAT WILL BE ENCOUNTERED DURING THE INSTALLATION OF THE WORK. ALIGNMENT OF EQUIPMENT AND ROUTING OF RACEWAYS MAY BE VARIED SLIGHTLY TO ACCOMMODATE ARCHITECTURAL CONDITIONS OR TO AVOID THE WORK OF OTHER TRADES. IF ANY CONFLICTS OCCUR NECESSITATING DEPARTURES FROM CONTRACT DRAWINGS, DETAILS OF DEPARTURES AND REASONS THEREFORE SHALL BE SUBMITTED AS SOON AS PRACTICABLE FOR WRITTEN APPROVAL OF THE ENGINEER.

14) THE WORD "CONTRACTOR", AS USED IN THE ELECTRICAL CONTRACT DOCUMENTS, SHALL MEAN THE PRIME (I.E. GENERAL) CONTRACTOR AND THEIR SUBCONTRACTORS FOR THE APPROPRIATE TRADE. WHERE THE OWNER ACTS AS THEIR OWN CONTRACTOR, THE WORD CONTRACTOR APPLIES TO THE OWNER.

15) CONTRACTOR SHALL PROVIDE EVIDENCE OF LICENSING, BONDING, AND INSURANCE, AND PROVIDE OTHER NECESSARY ADMINISTRATIVE FUNCTIONS FOR CONTRACTOR'S WORK.

16) CONTRACTOR SHALL PROCURE AND PAY FOR ALL REQUIRED PERMITS AND SERVICE CHARGES.

17) COORDINATION: CONFORM TO GENERAL CONSTRUCTION CONTRACT DOCUMENTS EXCEPT AS MODIFIED HEREIN. REFER ALSO TO STRUCTURAL AND MECHANICAL CONTRACT DOCUMENTS. COORDINATE ALL WORK WITH OTHER TRADES.

18) CUTTING AND PATCHING: ANY CUTTING, ATTACHING, OR WELDING TO BUILDING STRUCTURE SHOULD BE COORDINATED AND APPROVED BY A CALIFORNIA LICENSED STRUCTURAL ENGINEER. PATCHING SUBJECT TO ACCEPTANCE BY OWNER.

19) SAW CUT TRENCHES IN SLAB SHALL BE FULLY RESTORED AND REINFORCED TO PREVENT SAGGING. ROUGHEN SAW CUT EDGES PRIOR TO RE-POURING CONCRETE.

20) COORDINATE ALL WORK WITH OTHER TRADES TO PROVIDE A COMPLETE INSTALLATION. CONNECT ALL EQUIPMENT FURNISHED BY OTHERS AS REQUIRED. INSTALL ALL WORK TO CLEAR ARCHITECTURAL AND STRUCTURAL MEMBERS. INSTALL ALL ABOVE GRADE (OVERHEAD) PIPING AS HIGH AS PRACTICAL.

21) RESTORE ALL DAMAGE RESULTING FROM THE WORK AND LEAVE PREMISES IN CLEAN CONDITION WHEN FINISHED WITH WORK. ADJUST, CLEAN, REPAIR, OR REPLACE PRODUCTS, WHICH HAVE BEEN DAMAGED.

22) PROVIDE FLASHING AND COUNTER FLASHING FOR ALL WALL AND ROOF PENETRATIONS.

23) WARRANTY: ALL MATERIALS AND EQUIPMENT INSTALLED UNDER THIS CONTRACT SHALL BE GUARANTEED FREE FROM ALL MECHANICAL, ELECTRICAL, AND WORKMANSHIP DEFECTS FOR A MINIMUM OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES TO THE PREMISES CAUSED BY WORK UNDER THIS CONTRACT, AS WELL AS ANY DAMAGE FROM LEAKS VIA ROOF PENETRATIONS MADE AND SEALED UNDER CONTRACTOR'S SCOPE.

ELECTRICAL CALGREEN NOTES

5.106.5.3 ELECTRIC VEHICLE (EV) CHARGING. CONSTRUCTION SHALL COMPLY WITH CGC SECTION 5.106.5.3.1 OR SECTION 5.106.5.3.2 TO FACILITATE FUTURE INSTALLATION OF ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).

5.106.5.3.1 SINGLE CHARGING SPACE REQUIREMENTS. WHEN ONLY A SINGLE CHARGING SPACE IS REQUIRED PER CGC TABLE 5.106.5.3.3, A RACEWAY IS REQUIRED TO BE INSTALLED AT THE TIME OF CONSTRUCTION AND SHALL BE INSTALLED IN ACCORDANCE WITH CEC

5.106.5.3.2 MULTIPLE CHARGING SPACES REQUIREMENTS. WHEN MULTIPLE CHARGING SPACES ARE REQUIRED PER CGC TABLE 5.106.5.3.3, RACEWAY(S) IS/ARE REQUIRED TO BE INSTALLED AT THE TIME OF CONSTRUCTION AND SHALL BE INSTALLED IN ACCORDANCE WITH CEC

5.106.5.3.3 EV CHARGING SPACE CALCULATION. CGC TABLE 5.106.5.3.3 SHALL BE USED TO DETERMINE IF SINGLE OR MULTIPLE CHARGING SPACE REQUIREMENTS APPLY FOR THE FUTURE INSTALLATION OF EVSE.

5.106.5.3.4 IDENTIFICATION. THE SERVICE PANEL OR SUBPANEL(S) CIRCUIT DIRECTORY SHALL IDENTIFY THE RESERVED OVERCURRENT PROTECTIVE DEVICE SPACE(S) FOR FUTURE EV CHARGING AS "EV CAPABLE". THE RACEWAY TERMINATION SHALL BE PERMANENTLY AND VISIBLY MARKED AS "EV CAPABLE"

5.106.5.3.5 FUTURE CHARGING SPACES: FUTURE CHARGING SPACES QUALIFY AS DESIGNATED PARKING AS DESCRIBED IN CGC SECTION 5.106.5.2 DESIGNATED PARKING FOR CLEAN AIR VEHICLES.

MEP ANCHORAGE NOTE

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA-APPROVED CONSTRUCTION DOCUMENTS. THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2022 CBC SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTERS 13, 26, AND 30:

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS, OR WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES HAVING A FLEXIBLE CABLE.
3. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE BUT NEED NOT DEMONSTRATE DESIGN COMPLIANCE WITH THE REFERENCES NOTED ABOVE. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS:

A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVING A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.

B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL, AND PLUMBING COMPONENTS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.

MEP BRACING NOTE

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7 SECTION 13.3 AS DEFINED IN ASCE 7 SECTIONS 13.6.5, 13.6.6, 13.6.7, 13.6.8; AND 2022 CBC, SECTIONS 1617A.1.24, 1617A.1.25, AND 1617A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW. THE MEP DESIGN PROFESSIONAL ENGINEER RESPONSIBLE FOR CONTENT ON THESE SHEETS HAS VERIFIED THAT THE DESIGN METHODS IDENTIFIED BELOW ARE IN ACCORDANCE WITH DSA IR 16-13.

MECHANICAL PIPING (MP), MECHANICAL DUCTWORK (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

MP☐ MD☐ PP☐ E☒ OPTION 1: PROJECT-SPECIFIC DESIGN

MP☐ MD☐ PP☐ E☐ OPTION 2: DESIGN BASED ON OSHPD OPM, WITHIN PROJECT SUBMITTAL

MP☐ MD☐ PP☐ E☐ OPTION 3: DESIGN BASED ON OSHPD OPM, DEFERRED SUBMITTAL

LIGHTING FIXTURE SCHEDULE

TAG	TYPE	MANU.	SERIES	MODEL	QTY.	MOUNTING	VOLT.	WATTAGE	SOURCE	LUMENS	CCT	REMARKS
01	OUTDOOR POLE	COOPER	MCGRAW-EDISON	GALN-SA2A-840-U-SWQ	13	POLE @25' ABOVE GRADE	277	63.0	LED	9625	4000K	SEE PLANS FOR QTY OF LIGHT HEADS PER POLE, PROVIDE WITH INTEGRAL PHOTOCELL, BUG RATING: B4-U0-G2
02	OUTDOOR POLE	COOPER	MCGRAW-EDISON	GALN-SA4A-840-U-SWQ	4	POLE @25' ABOVE GRADE	277	121.0	LED	18,974	4000K	1 LIGHT HEAD PER POLE, PROVIDE WITH INTEGRAL PHOTOCELL, BUG RATING: B4-U0-G2
03	OUTDOOR POLE	COOPER	MCGRAW-EDISON	GALN-SA1B-840-U-T2BC	8	POLE @25' ABOVE GRADE	277	39.0	LED	4549	4000K	1 LIGHT HEAD PER POLE, PROVIDE WITH INTEGRAL PHOTOCELL, BUG RATING: N/A
04	OUTDOOR POST-TOP	COOPER	INVUE	MSA-SA2C-840-U-SWQ	13	POST @15' ABOVE GRADE	277	113.0	LED	13,233	4000K	PROVIDE WITH INTEGRAL PHOTOCELL, BUG RATING: B4-U0-G2

NOTES: COORDINATE ALL ARCHITECTURAL TRIM AND ACCESSORY OPTIONS WITH OWNER
EQUIVALENT FIXTURES ACCEPTABLE CONTINGENT ON OWNER APPROVAL

EQUIPMENT SCHEDULE

TAG	TYPE	MANU.	MODEL	SERVES	RATINGS	DIMENSIONS (L"xW"xH")	WEIGHT (LBS)	REMARKS
TX-LS	TRANSFORMER	SQUARE D	EX225T3H	PANEL LS	225KVA, 480V -> 208Y/120V, NEMA 3R	40"x33"x58"	1450	COMPLETELY ENCLOSED EXCEPT FOR VENTILATION OPENINGS, CLASS 220 INSULATION, MEETS THE EXCEPTION FOR CEC 450.21, SEE DETAIL 9/E1.31.1
MSB	MAIN SWITCHBOARD	SQUARE D	QED-2	SITE	NEMA 3R	120"x39"x92"	2687	CONTACT JAKE WIFFLER AT EDGES ELECTRICAL GROUP - SACPOWER@EDGESGROUP.COM, SEE DETAIL 4/E1.31.1

ELECTRICAL LEGEND

- 2X4 LIGHT FIXTURE (SURFACE, RECESSED)
- 2X2 LIGHT FIXTURE (SURFACE, RECESSED)
- FIXTURE W/ BATTERY BACKUP (TYP. ALL WALKED FIXTURES)
- RECESSED DOWNLIGHT
- ROUND SURFACE MOUNT LIGHT
- PENDANT LIGHT
- TRACK LIGHT
- SIGNLIGHT
- WALL MOUNT LIGHT
- POLE MOUNT LIGHT - 2 HEAD
- POLE MOUNT LIGHT - 1 HEAD
- EXIT/EMERGENCY COMBO LIGHT
- EMERGENCY FIXTURE
- EXIT LIGHT
- CEILING EXHAUST FAN
- $S_{"X"}$ WALL MOUNTED SWITCH
- $S_{3,"X"}$ WALL MOUNTED 3-WAY SWITCH
- (P) PHOTOCELL
- PRIMARY AND SECONDARY DAYLIT ZONES
- "X" CEILING MOUNTED SENSOR
- RECEPTACLE - DUPLEX
- RECEPTACLE - QUADRUPLEX
- RECEPTACLE - DEDICATED
- RECEPTACLE - 2-POLE
- RECEPTACLE - SPECIALTY, SEE PLANS FOR TYPE
- RECEPTACLE WITH USB PORT
- FLOOR MOUNTED RECEPTACLE
- CEILING MOUNTED RECEPTACLE
- PHONE-DATA PORT
- (S) SMOKE DETECTOR
- (C) CARBON MONOXIDE DECTECTOR
- (J) JUNCTION BOX
- 3P 60/40 DISCONNECT - POLES (CAPACITY/FUSE)
- "X"-1,3,5 HOME RUN - PANEL-CIRCUIT(S)
- WIRE/CONDUIT - OVERHEAD
- WIRE/CONDUIT - UNDERGROUND
- POWER PANEL
- T TRANSFORMER

AFF	ABOVE FINISHED FLOOR
+XX"	HEIGHT (INCHES) AFF
D	DIMMER
M	OCCUPANCY SENSOR
V	VACANCY SENSOR
GFCI	GROUND FAULT CURRENT INTERRUPTER
WP	WEATHERPROOF
HP	HORSEPOWER
BHP	BRAKE HORSEPOWER
NTS	NOT TO SCALE
GND	GROUND
GEC	GROUNDING ELECTRODE CONDUCTOR
MSB	MAIN SWITCHBOARD
SBJ	SYSTEM BONDING JUMPER
SSBJ	SUPPLY SIDE BONDING JUMPER
BCPM	BRANCH CIRCUIT POWER METER
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED

AGENCY APPROVAL:

LODI USD

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2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

NOTES

OPTIMIZED ENERGY & FACILITIES CONSULTING, INC.
Office: (916) 626 5518 www.oefcinc.com

REGISTERED PROFESSIONAL ENGINEER ALEXANDRE M. BATTISTA No.E23735 EXP. 12-31-2025 STATE OF CALIFORNIA

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE ST,
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
ELECTRICAL SCHEDULES & GENERAL NOTES

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

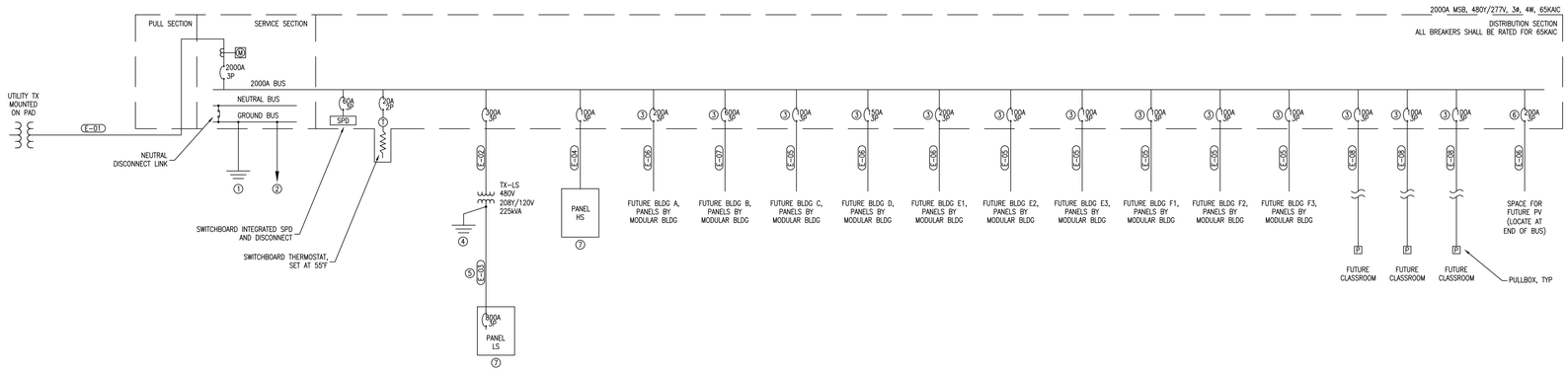
SHEET:

E1.11.1

PLEASE RECYCLE

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ANSI SHEETS ORIGINAL IMAGE SIZE

ONE-LINE DIAGRAM



FEEDER SCHEDULE

TAG	# OF SETS	CONDUIT (PER SET)	CONDUCTORS (PER SET)		REMARKS
			PHASE/NEUTRAL	GROUND	
E-01	5	4"ø	(4) 600 KCMIL CU	–	–
E-02	1	3"ø	(3) 350 KCMIL CU	(1) #4 AWG CU	–
E-03	2	4"ø	(4) #600 KCMIL CU	(1) #4 AWG CU SSBJ	–
E-04	1	1-1/4"ø	(4) #3 AWG CU	(1) #8 AWG CU	–
E-05	1	2"ø	–	–	–
E-06	1	3"ø	–	–	–
E-07	2	3"ø	–	–	–
E-08	1	2"ø	–	–	CONDUIT RUN TO PULLBOX AT NORTH END OF CAMPUS FOR FUTURE BUILDINGS

ONE-LINE NOTES:

1. (N) – NEW
   (E) – EXISTING
   (R) – REPLACED
   (F) – FUTURE
2. ALL EQUIPMENT/WIRING IS (N) U.O.N.
3. ALUMINUM WIRING INSULATION SHALL BE XHHW, U.O.N. COPPER WIRING INSULATION SHALL BE THWN-2, U.O.N.
4. THE SERVICE DISCONNECT SHALL BE PERMANENTLY MARKED PER CEC 230.70(B)
5. POST A DATED AVAILABLE FAULT CURRENT CALCULATION AT THE SERVICE EQUIPMENT PER CEC 110.24
6. SWITCHBOARDS, PANELBOARDS, INDUSTRIAL CONTROLS PANELS, ETC. SHALL BE FIELD OR FACTORY MARKED TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS. MARKING SHALL MEET 110.21(B) AND BE CLEARLY VISIBLE PER CEC 110.16
7. SERVICE EQUIPMENT SHALL HAVE METERING CAPABILITIES PER CENC TABLE 130.5-A
8. SERVICE EQUIPMENT SHALL BE GFI TESTED IN ACCORDANCE WITH CEC 230.95. THE TESTING REPORT SHALL BE PROVIDED TO THE BUILDING OFFICIAL PRIOR TO ENERGIZATION
9. ALL SWITCHBOARDS AND PANELBOARDS SUPPLIED BY A FEEDER SHALL BE MARKED TO INDICATE THE DEVICE OR EQUIPMENT WHERE THE POWER SUPPLY ORIGINATES PER CEC 408.4(B)
10. FOR SWITCHBOARDS 1200A OR LARGER, PROVIDE ENERGY REDUCING MAINTENANCE SWITCH (ERMS) OR OTHER METHOD OF ARC ENERGY REDUCTION PER CEC 240.87, AND SERVICE EQUIPMENT LABELING PER CEC 110.16(B)
11. POST IDENTIFICATION FOR CONDUCTORS OF DIFFERENT VOLTAGE SYSTEMS PER CEC 210.5
12. AN INTERSYSTEM BONDING ELECTRODE WHICH INCLUDES PROVISIONS FOR CONNECTING AT LEAST THREE GROUNDING OR BONDING CONDUCTORS REQUIRED FOR COMMUNICATIONS SYSTEMS SHALL BE INSTALLED EXTERNALLY AT THE SERVICE EQUIPMENT AS SPECIFIED IN CEC 800.100(B) AND CEC 250.94

ONE-LINE KEY NOTES:

1. GROUND ELECTRODE SYSTEM: PROVIDE GROUND ELECTRODE PER CEC 250.52(A), AND CONNECT TO SERVICE EQUIPMENT WITH MINIMUM #3/0 AWG CU GEC PER CEC 250.24
2. MINIMUM #3/0 BARE COPPER BOND TO METAL FRAMING AND METAL PIPING
3. BREAKER SIZE TO BE COORDINATED WITH MODULAR BLDG DESIGNER
4. GROUND ELECTRODE SYSTEM: PROVIDE GROUND ELECTRODE PER CEC 250.52(A), AND CONNECT TO TRANSFORMER WITH MINIMUM #4 AWG CU GEC AND PROVIDE #4 AWG CU SBJ PER CEC 250.30
5. SECONDARY CONDUCTORS MAX LENGTH SHALL BE 25' PER CEC 240.21(C)(6)
6. BREAKER SIZE TO BE COORDINATED WITH PV SYSTEM DESIGNER
7. ENSURE THAT PANEL HAS THE ABILITY TO ACCEPT BCPM FOR INDIVIDUAL CIRCUIT MONITOR OR PROVIDE ALTERNATIVE ACCEPTABLE METHOD THAT COMPLIES WITH CENC 130.5(b)

PLEASE RECYCLE

AGENCY APPROVAL:

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PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
ONE-LINE DIAGRAM

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

E1.12.1

THE LINE BROWN ABOVE IS EXACTLY 1" LONG ON ORIGINAL 24x36 SHEETS (ORIGINAL IMAGE SIZE)

PANEL 'HS' SCHEDULE

Panel Name:	HS				Bus Rating:	100A					
Voltage & Phase:	480Y/277 - 3ϕ - 4W				AIC Rating:	50kAIC					
Mounting:	Free-Standing				Main Type:	Circuit Breaker					
Enclosure Rating:	NEMA 3R				MCB Rating:	100A					
Code	VA	Description	BRK	Ckt	PHASE	Ckt	BRK	Description	VA	Code	
L	1131	Perimeter/Parking Lights	20/1	1	A	2	40/3	Irrigation Pump Controller	3723	O	
L	1953	Interior Post Lights	20/1	3	B	4	-		3723	O	
		Spare	20/1	5	C	6	-		3723	O	
		Spare	20/1	7	A	8	20/1	Spare			
		Spare	20/1	9	B	10	20/1	Spare			
		Space		11	C	12		Space			
		Space		13	A	14		Space			
		Space		15	B	16		Space			
		Space		17	C	18		Space			
		Space		19	A	20		Space			
		Space		21	B	22		Space			
		Space		23	C	24		Space			

Largest Motor VA	11141
Largest Motor Phases:	A,B,C
Subfeed Breaker to Panel:	

Load Code	VA Load per Phase			Calculation		
	A	B	C	Total VA	Mult.	VA Load
R = Recept	0	0	0	0	1.00	0
K = Kitchen	0	0	0	0	1.00	0
M = Motor	0	0	0	0	1.00	0
L = Lighting	1131	1953	0	3084	1.25	3855
H = Heat	0	0	0	0	1.25	0
PV = Solar	0	0	0	0	1.25	0
EV = Elec. Vehicle	0	0	0	0	1.25	0
O = Other	3722.543	3722.543	3722.543	11167.63	1.00	11168
Load Totals	4853.543	5675.543	3722.543	14251.63	1.05	15022.63
VA of Largest Motor				11141.2	0.25	2785.3
Subfeed VA Loads	0.0	0.0	0.0			
Total VA Loads	6064.7	7092.2	4651.0			
Load Balance	102.2%	119.5%	78.4%			
			VA Load This Panel			17807.9
			Amperage This Panel Per Largest Phase VA			25.6

Notes:
- Panel AIC rating based on wire size and length

PANEL 'LS' SCHEDULE

Panel Name:	LS				Bus Rating:	800A					
Voltage & Phase:	208Y/120 - 3ϕ - 4W				AIC Rating:	22kAIC					
Mounting:	Free-Standing				Main Type:	Circuit Breaker					
Enclosure Rating:	NEMA 3R				MCB Rating:	800A					
Code	VA	Description	BRK	Ckt	PHASE	Ckt	BRK	Description	VA	Code	
EV	4992	EV Capable #1	60/2	1	A	2	60/2	EV Capable #11	4992	EV	
EV	4992		-	3	B	4	-		4992	EV	
EV	4992	EV Capable #2	60/2	5	C	6	60/2	EV Capable #12	4992	EV	
EV	4992		-	7	A	8	-		4992	EV	
EV	4992	EV Capable #3	60/2	9	B	10	60/2	EV Capable #13	4992	EV	
EV	4992		-	11	C	12	-		4992	EV	
EV	4992	EV Capable #4	60/2	13	A	14	60/2	EVCS #1	4992	EV	
EV	4992		-	15	B	16	-		4992	EV	
EV	4992	EV Capable #5	60/2	17	C	18	60/2	EVCS #2	4992	EV	
EV	4992		-	19	A	20	-		4992	EV	
EV	4992	EV Capable #6	60/2	21	B	22	60/2	EVCS #3	4992	EV	
EV	4992		-	23	C	24	-		4992	EV	
EV	4992	EV Capable #7	60/2	25	A	26	60/2	EVCS #4	4992	EV	
EV	4992		-	27	B	28	-		4992	EV	
EV	4992	EV Capable #8	60/2	29	C	30	20/1	Recept - Service Conv	180	R	
EV	4992		-	31	A	32	20/1	Irrigation Controller	100	O	
EV	4992	EV Capable #9	60/2	33	B	34	20/1	Irrigation Controller	100	O	
EV	4992		-	35	C	36	20/1	Spare			
EV	4992	EV Capable #10	60/2	37	A	38	20/1	Space			
EV	4992		-	39	B	40	20/1	Space			
		Spare	20/1	41	C	42	20/1	Space			

Largest Motor VA	0
Largest Motor Phases:	A,B,C
Subfeed Breaker to Panel:	

Load Code	VA Load per Phase			Calculation		
	A	B	C	Total VA	Mult.	VA Load
R = Recept	0	0	180	180	1.00	180
K = Kitchen	0	0	0	0	1.00	0
M = Motor	0	0	0	0	1.00	0
L = Lighting	0	0	0	0	1.25	0
H = Heat	0	0	0	0	1.25	0
PV = Solar	0	0	0	0	1.25	0
EV = Elec. Vehicle	59904	59904	49920	169728	1.25	212160
O = Other	100	100	0	200	1.00	200
Load Totals	60004	60004	50100	170108	1.25	212540
VA of Largest Motor				0	0.25	0
Subfeed VA Loads	0.0	0.0	0.0			
Total VA Loads	74980.0	74980.0	62580.0			
Load Balance	105.8%	105.8%	88.3%			
			VA Load This Panel			212540.0
			Amperage This Panel Per Largest Phase VA			624.8

Notes:
- Panel AIC rating based on wire size and length

VOLTAGE DROP SUMMARY

Voltage Drop Summary				
Total Feeder Voltage Drop		**Worst Case Branch Circuit**		**Worst Case Voltage Drop**
MSB-->HS	0.02%	HS-3	1.27%	1.28%
MSB-->TX-LS-->LS	0.03%	LS-14,16	4.04%	4.06%

AGENCY APPROVAL:

LODI USD

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ISSUE

Δ	DESCRIPTION	DATE

KEYNOTES

NOTES

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2801 W VINE ST,
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
ELECTRICALPANEL SCHEDULES

DSA SUBMITTAL

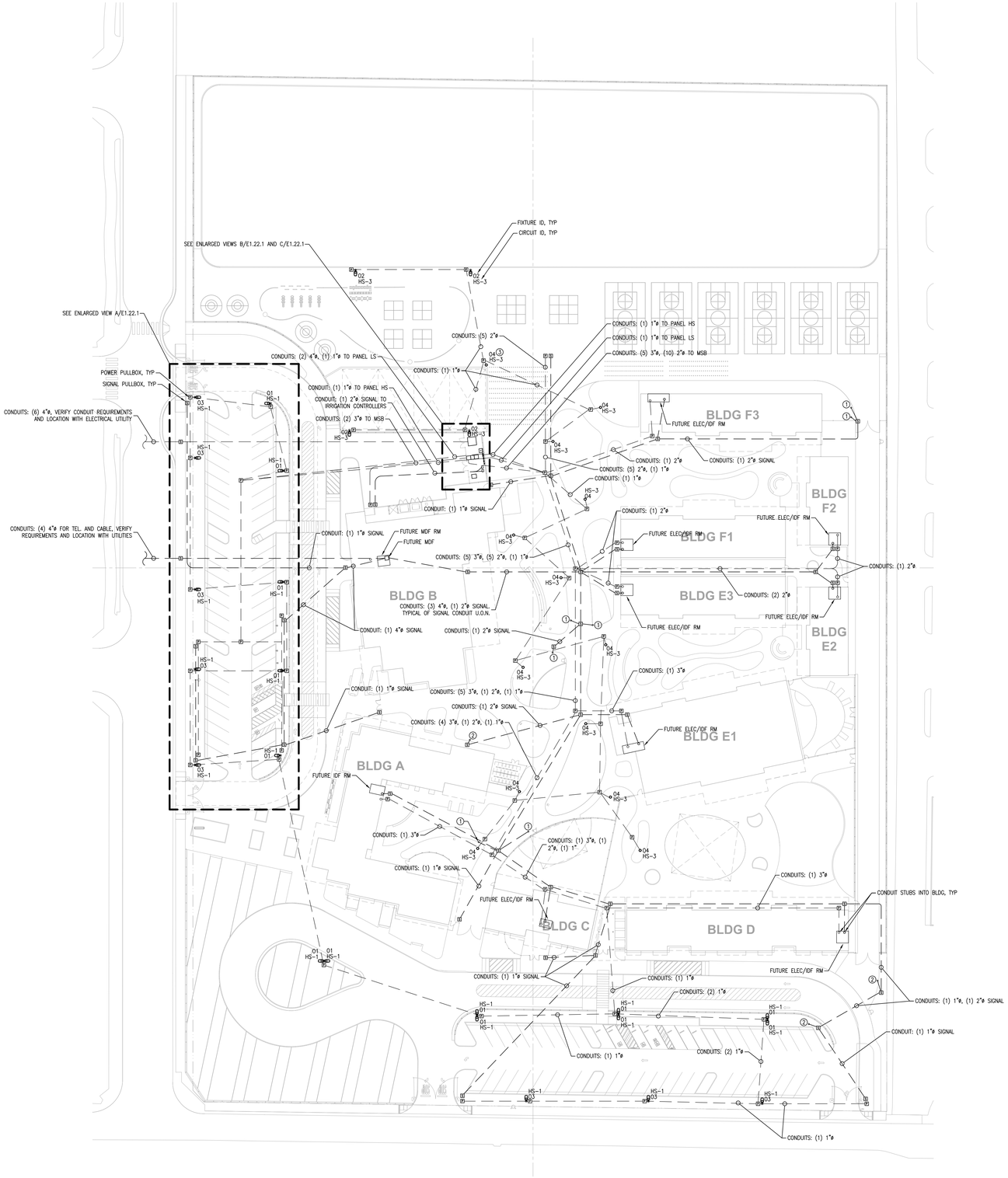
DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

E1.13.1

PLEASE RECYCLE

THE LINE SHOWN ABOVE IS EXACTLY 3" LONG ON ALL PLANS SHEETS ORIGINAL IMAGE SIZE



A ELECTRICAL SITE PLAN - POWER & SIGNAL
SCALE: 1"=40'-0"

NORTH

SHEET NOTES:

1. ALL WIRING TO BE #10 AWG CU AND ALL CONDUIT TO BE 1" U.O.N.
2. ALL UNDERGROUND CONDUIT SHALL BE PVC U.O.N. AND HAVE A MINIMUM BURIAL DEPTH PER CEC TABLE 300.5
3. ALL RECEPTACLES LOCATED OUTSIDE SHALL BE TYPE WEATHER RESISTANT, GFCI WITH EXTRA DUTY IN-USE COVER, PER CEC 210.8 AND 406.9(B)
4. ALL POLE MOUNTED LIGHT FIXTURES TO HAVE CONCRETE POLE BASE, SEE DETAIL 1/E1.32.1
5. ALL POST TOP LIGHT FIXTURES TO BE MOUNTED PER DETAIL 2/E1.32.1, U.O.N.
6. PULL BOXES FOR POWER DISTRIBUTION SHALL BE ENGRAVED "ELECTRIC" ON LID, LOCATIONS ARE DIAGRAMMATIC AND NOT DIMENSIONED. PULLBOXES AT DRIVE AISLE AREAS TO HAVE TRAFFIC-RATED LID COVER
7. PULL BOXES FOR SIGNAL SYSTEMS (FIBER AND FIRE ALARM) SHALL BE ENGRAVED "DATA" ON LID. LOCATIONS ARE DIAGRAMMATIC AND NOT DIMENSIONED. PULLBOXES TO HAVE TRAFFIC-RATED LID COVER

KEY NOTES:

1. 2"ø CONDUIT FOR FIRE ALARM TO POST INDICATOR VALVE AND CHECK VALVE
2. 2"ø CONDUIT FOR FIRE ALARM TO POST INDICATOR VALVE
3. PROVIDE POLE BASE FOR FIXTURE PER DETAIL 1/E1.32.1

AGENCY APPROVAL:

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EXP. 12-31-2025
STATE OF CALIFORNIA

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LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
ELECTRICAL SITE PLAN
POWER & SIGNAL

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

E1.21.1

PLEASE RECYCLE

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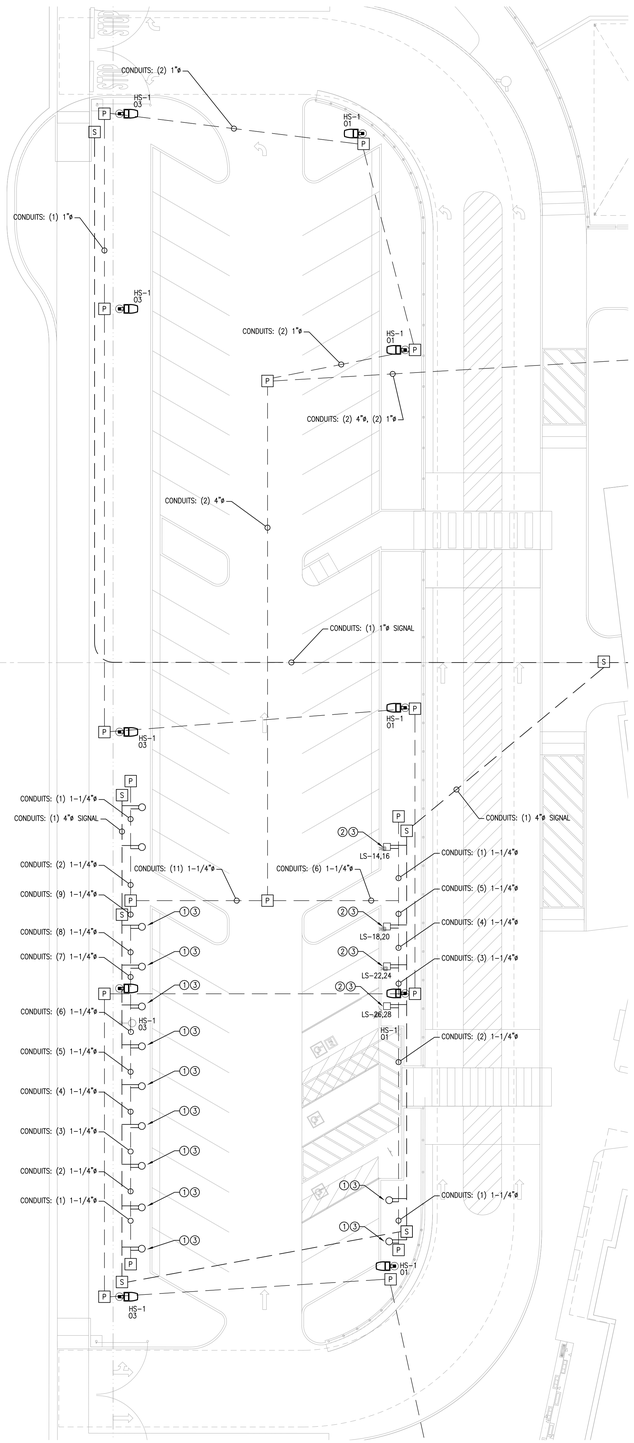
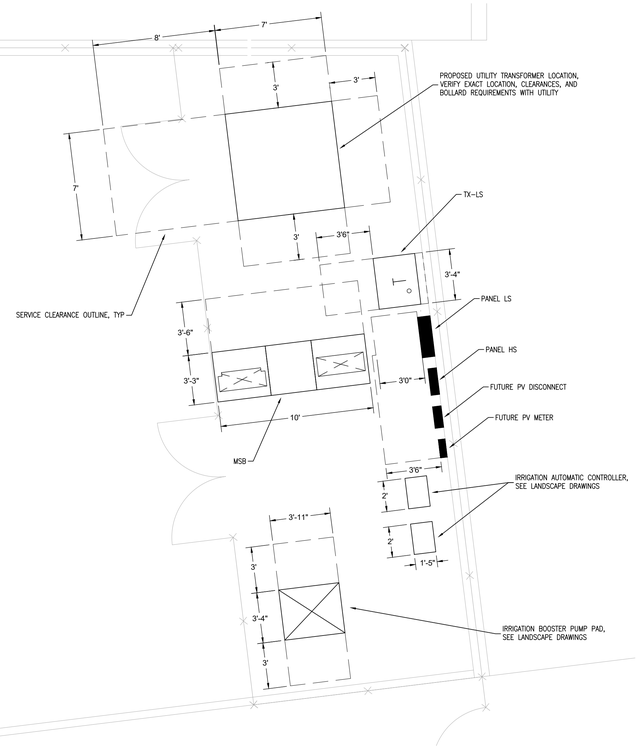


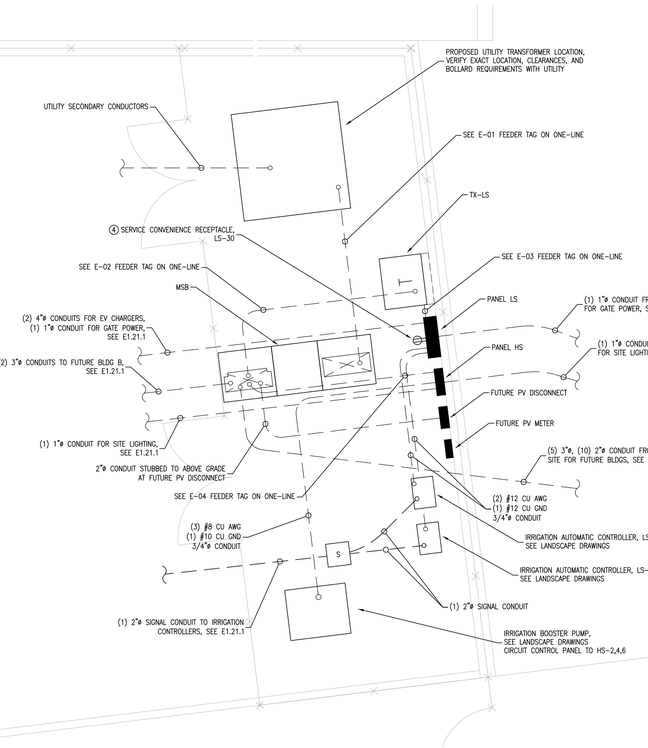
A ENLARGED WEST PARKING
SCALE: 1/16"=1'-0"



B ENLARGED UTILITY YARD - DIMENSIONED
SCALE: 1/4"=1'-0"

SHEET NOTES:

1. ALL WIRING TO BE #10 AWG CU AND ALL CONDUIT TO BE 1" U.O.N.
2. ALL UNDERGROUND CONDUIT SHALL BE PVC U.O.N. AND HAVE A MINIMUM BURIAL DEPTH PER CEC TABLE 300.5
3. ALL RECEPTACLES LOCATED OUTSIDE SHALL BE TYPE WEATHER RESISTANT, GFCI WITH EXTRA DUTY IN-USE COVER, PER CEC 210.8 AND 406.9(B)



C ENLARGED UTILITY YARD - POWER
SCALE: 1/4"=1'-0"

KEY NOTES:

1. INSTALL 12" ROUND CHRISTY BOX WITH CONDUIT STUBBED (PROVIDE WITH PULL STRING) FOR FUTURE EV CHARGER AND LABEL AS "EV CAPABLE"
2. EV CHARGER, CIRCUIT AS SHOWN (2) #2 CU THWN-2 (1) #4 CU GND 1-1/4"ø CONDUIT
3. 1"ø CONDUIT: DATA TO EV CHARGER
4. WEATHER RESISTANT, GFCI RECEPTACLE MOUNTED ON PANEL LS UNISTRUT SUPPORT

NORTH

PLEASE RECYCLE

AGENCY APPROVAL:

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LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
ELECTRICAL SITE PLAN
POWER & SIGNAL
ENLARGED

DSA SUBMITTAL

DATE: **12/09/2025** | CLIENT PROJ NO:

SHEET:

E1.22.1

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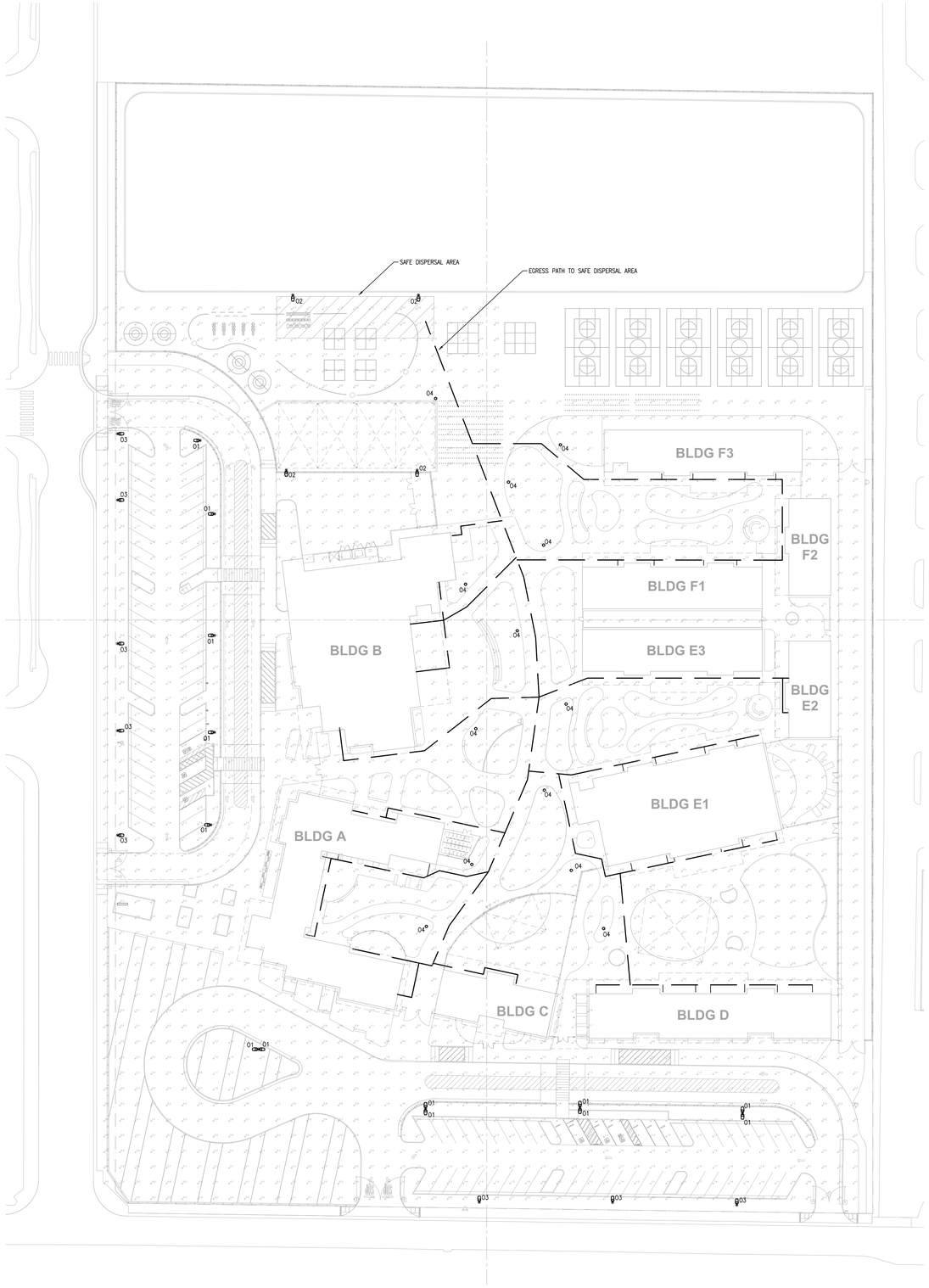

A ELECTRICAL SITE PLAN - LIGHTING
SCALE: 1"=40'-0"

NORTH

AGENCY APPROVAL:

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LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
ELECTRICAL SITE PLAN
LIGHTING

DSA SUBMITTAL

DATE: 12/09/2025
CLIENT PROJ NO:
SHEET:

E1.23.1

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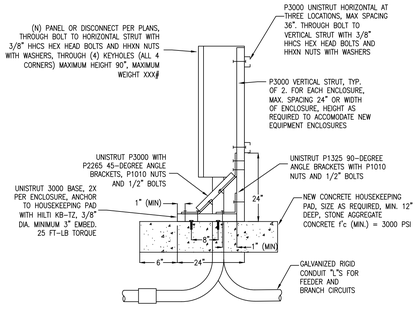
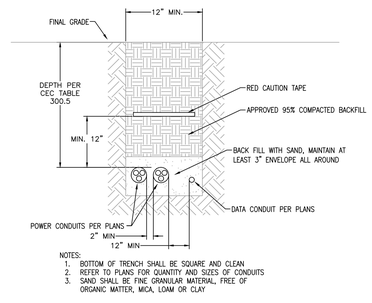
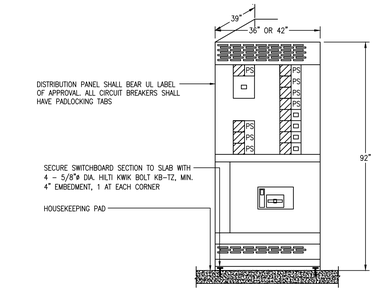


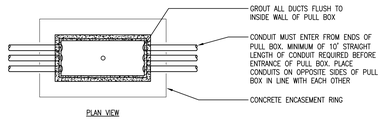
PEDESTAL MOUNTED EQUIPMENT — 1 / E1.31.1

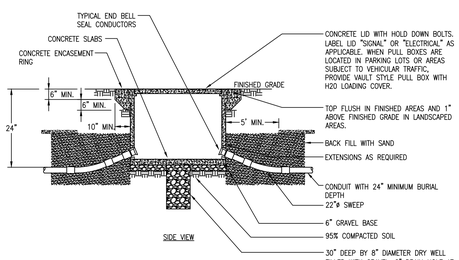


UNDERGROUND TRENCH DETAIL — 2 / E1.31.1

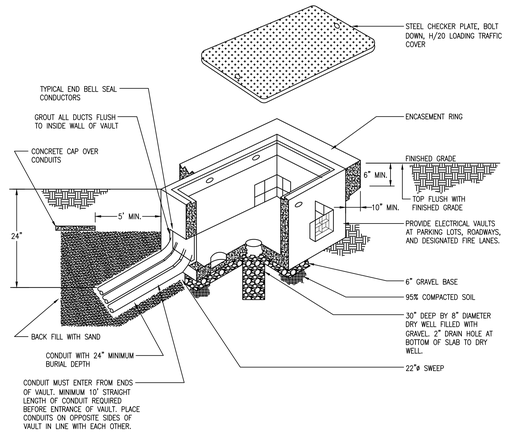


DISTRIBUTION PANEL MOUNTING DETAIL — 3 / E1.31.1

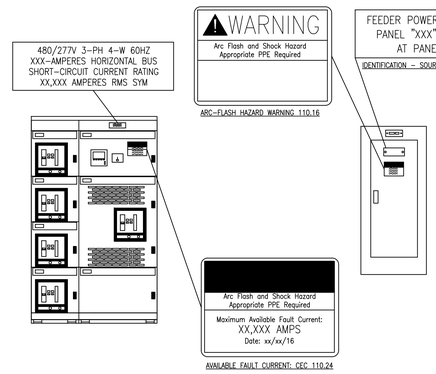




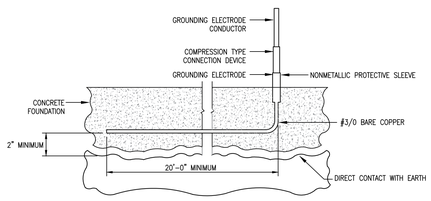
PULL BOX DETAIL — 4 / E1.31.1



ELECTRICAL VAULT AT TRAFFIC LOCATION — 5 / E1.31.1



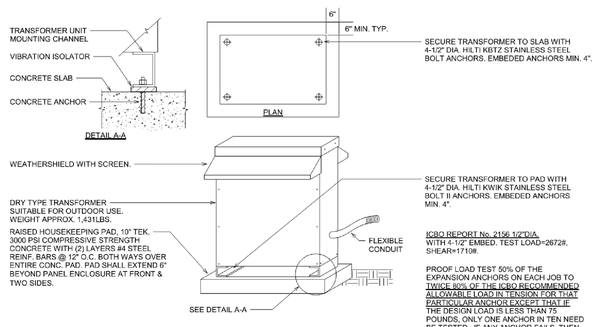
SERVICE EQUIPMENT & BRANCH CIRCUIT PANEL MARKING — 6 / E1.31.1



UFER GROUND DETAIL

THE GROUND SYSTEM SHALL CONSIST OF A "UFER" TYPE 20' OF #4 BARE COPPER CONDUCTOR EMBEDDED ALONG THE BOTTOM OF A CONCRETE FOOTING OR GRADE BEAM THAT IS IN DIRECT CONTACT WITH THE EARTH

UFER GROUND DETAIL — 7 / E1.31.1



EXTERIOR TRANSFORMER MOUNTING DETAIL — 8 / E1.31.1

STAINLESS STEEL HILTI KB-TZ

ANCHOR DIAMETER (INCHES)	MINIMUM DEPTH OF EMBEDMENT (INCHES)	MINIMUM EDGE DISTANCE (INCHES)	MINIMUM SPACING (INCHES)	MIN. CONC. MEMBER THICKNESS (INCHES)	TEST TORQUE (FT. LBS.)
0.375	2.3125	4.375	6.0	4.00	25
0.50	3.625	7.50	9.75	6.00	40
0.625	4.4375	8.75	12.00	6.00	60
0.75	5.5625	9.00	14.25	8.00	110

1. VALUES SHOWN ARE FOR STAINLESS STEEL HILTI KB-TZ, ICC REPORT #ESR-1917. EQUIVALENT IS ACCEPTABLE AS APPROVED BY STRUCTURAL ENGINEER AND DSA.
2. VALUES IN TABLES ARE BASED ON 3500 PSI NORMAL WEIGHT CRACKED CONCRETE FOR TEST VALUES AND 3000 PSI NORMAL WEIGHT CRACKED CONCRETE FOR ALLOWABLE LOADS.
3. LOCATED AND AVOID REINFORCEMENT WHEN INSTALLING ANCHORS, TYPICAL.
4. TEST AND INSPECT ANCHORS PER CBC SECTION 1910A.5 AND TABLE 1705A.3.
5. CONTRACTOR SHALL OBTAIN A COPY OF DSA's IR 19-1 AND COMPLY WITH ALL REQUIREMENTS OF THAT DOCUMENT.

AGENCY APPROVAL:

LODI USD

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KEYNOTES

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2801 W VINE ST,
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
ELECTRICAL DETAILS

DSA SUBMITTAL

DATE: **12/09/2025** CLIENT PROJ NO:

SHEET:

E1.31.1

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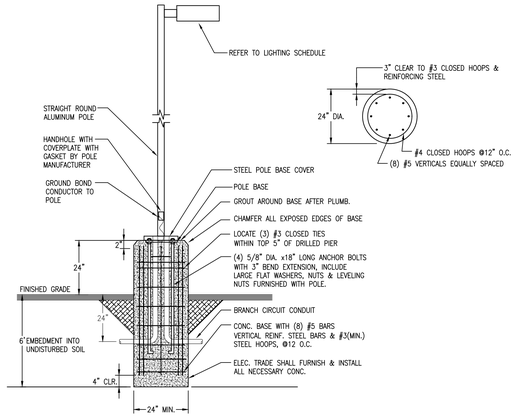
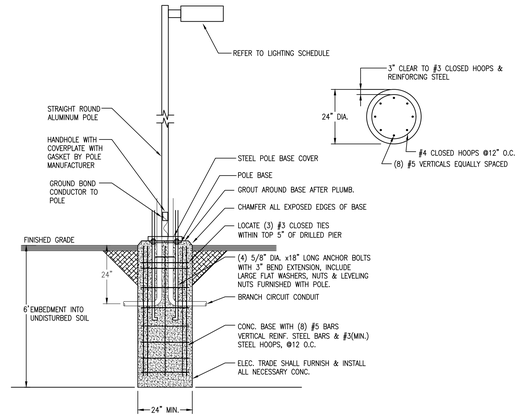
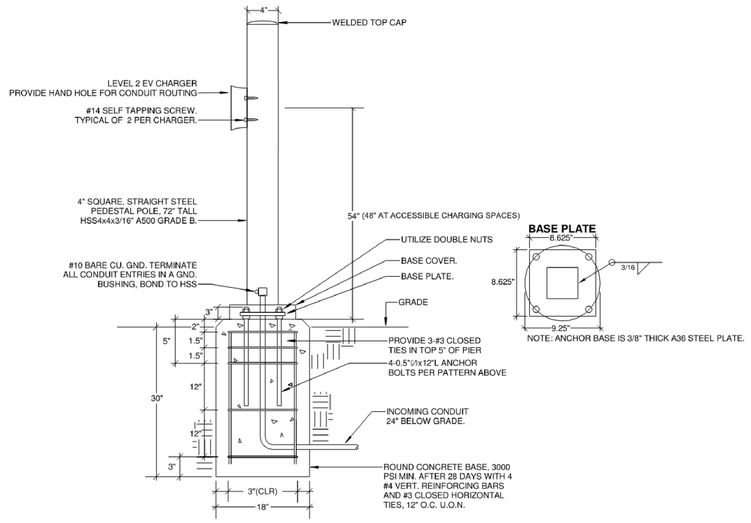


POLE-BASE MOUNTING DETAIL — 1 / E1.32.1



POLE MOUNTING DETAIL — 2 / E1.32.1



NOTES:

EV CHARGING STATIONS SHALL BE PER DISTRICT STANDARDS. COORDINATE REQUIREMENTS (OPTIONS, ACCESSORIES, SPECIAL CONFIGURATIONS) WITH OWNER PRIOR TO RELEASE. PROVIDE LEVEL 2 CHARGERS, AND 6-FOOT EVSE PEDESTAL. AT DUAL CONFIGURATION, PROVIDE TWO CHARGERS, AND HCS PEDESTAL DUAL MOUNT KIT.

SPECIAL INSPECTION OF PIERS IN COMPLIANCE WITH CBC SECTION 1705A.8 IS NOT REQUIRED.

EV CHARGER MOUNTING DETAIL — 3 / E1.32.1

AGENCY APPROVAL:

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No.E23735
EXP 12-31-2025
STATE OF CALIFORNIA

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2801 W VINE ST,
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
ELECTRICAL DETAILS

DSA SUBMITTAL

DATE: **12/09/2025** CLIENT PROJ NO:

SHEET:

E1.32.1

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STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
This document is used to demonstrate compliance with mandatory requirements in 130.5, for electrical systems in newly constructed nonresidential and hotel/motel occupancies and 160.6 and 160.9 for electrical systems in newly constructed multifamily occupancies. Additions and alterations to electrical service systems in nonresidential and hotel/motel occupancies will also use this document to demonstrate compliance per 141.0(a) or 141.0(b)2P for alterations. For multifamily addition or alterations compliance will be documented per 180.1(a) or 180.2 (b)4Bvii	
Project Name: Samuel M. Gantner Elementary School	**Report Page:** (Page 1 of 6)
Project Address: 2801 W Vine St	**Date Prepared:** 12/3/2025

A. GENERAL INFORMATION

01	Project Location (city)	Lodi	02	Climate Zone	12
			03	Occupancy Types Within Project:	

B. PROJECT SCOPE

This table includes electrical systems that are within the scope of the permit application.

01	02	03	04	05	06	07
Electrical Service Designation/ Description	Scope of Work[3]	Rating[2] (kVA)	Utility Provided Metering System Exception to 130.5(a)/ 160.6(a)[3]	System subject to CA Elec Code Article 517 Exception to 130.5(a)and (b)	Demand Response Controls	Provides power to dwelling units/common living areas only in multifamily occupancy
New Service	New electrical service equipment and meter	1661	☐	☐	Where required, demand response controls must be specified which are capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal, Sections 120.2/ 160.3, 130.1/ 160.5, and 130.3/ 160.5, and mechanical, indoor lighting, and sign lighting Certificate of Compliance documents will indicate when demand response controls are required.	☐

[1] FOOTNOTES: Adding only new feeders and branch circuits triggers Voltage Drop 130.5(c)/160.6(c), no other requirements from 130.5/160.6 are required.
[2] If common use areas in a multifamily are submetered, rating is for submeter size serving common use areas.
[3] Applicable if the utility company is providing a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
Project Name: Samuel M. Gantner Elementary School	**Report Page:** (Page 2 of 6)
	Date Prepared: 12/3/2025

C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through J. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

01		02		03		04	05	06
Service Electrical Metering 130.5(a)/ 160.6(a) (See Table F)	AND	Separation for Monitoring 130.5(b)/ 160.6(b) (See Table G)	AND	Voltage Drop 130.5(c)/ 160.6(c) (See Table H)	AND	Controlled Receptacles 130.5(d)/ 160.6(d) (See Table I)	Electric Ready 160.9 (See Table J)	**Compliance Results**
Yes	AND	Yes	AND	Yes	AND			COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. SERVICE ELECTRICAL METERING

This table includes new or replacement electrical service systems OR equipment to demonstrate compliance with 130.5(a) / 160.6(a). For multifamily occupancies, submetered systems that provide power to common use areas must meet the following metering requirements. Submetered systems providing power to dwelling units do not.

01	02	03				04	05	
Electrical Service Designation/ Description	Rating[1] (kVA)	Required Metering Capabilities per Table 130.5-A				Location of Requirements in Construction Documents	Field Inspector	
		Instantaneous Demand (kW)	Historical Peak Demand (kW)	Tracking kWh for user-defined period	kWh per rate period		Pass	Fail
New Service	1661	☒	☒		☒	E1.12.1	☐	☐

[1] FOOTNOTES: If common use areas in a multifamily are submetered, rating is for submeter size serving common use areas.

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

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G. SEPARATION OF ELECTRICAL CIRCUITS FOR ENERGY MONITORING

This table includes entirely new or complete replacement electrical power distribution systems to demonstrate compliance with 130.5(b)/ 160.6(b). Any load types that are not included in the service do not need to be shown. For multifamily occupancies, submetered systems that provide power to dwelling units do not need to meet these separation requirements and therefore load types on those submetered systems also do not need to be shown.

01	02	03	04	05	
Load Type per Table 130.5-B[1]	Minimum Required Separation of Load per Table 130.5-B	Compliance Method[2]	Location of Requirements in Construction Documents	Field Inspector	
				Pass	Fail
New Service					
Lighting including exit, egress and exterior	All lighting disaggregated by floor, type or area	Method 3: Branch circuits serve load types individually & provisions for adding future branch curcuit monitoring	E1.12.1	☐	☐
Plug Loads and appliances less than 25kVA	All plug loads separated by floor, type or area Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	Method 3: Branch circuits serve load types individually & provisions for adding future branch curcuit monitoring	E1.12.1	☐	☐
Charging stations for electrical vehicle	All loads in aggregate	Method 3: Branch circuits serve load types individually & provisions for adding future branch curcuit monitoring	E1.21.1	☐	☐

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CALIFORNIA ENERGY COMMISSION

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G. SEPARATION OF ELECTRICAL CIRCUITS FOR ENERGY MONITORING

This table includes entirely new or complete replacement electrical power distribution systems to demonstrate compliance with 130.5(b)/ 160.6(b). Any load types that are not included in the service do not need to be shown. For multifamily occupancies, submetered systems that provide power to dwelling units do not need to meet these separation requirements and therefore load types on those submetered systems also do not need to be shown.

01	02	03	04	05	
Load Type per Table 130.5-B[1]	Minimum Required Separation of Load per Table 130.5-B	Compliance Method[2]	Location of Requirements in Construction Documents	Field Inspector	
				Pass	Fail

** NOTES: If "Other**" is selected under Compliance Method above, please indicate how compliance has been achieved in the space provided below.*

[1] FOOTNOTES: For each separate load type, up to 10% of the connected load may be of any type.
[2] Method 1: Switchboards/ motor control centers/ panelboard loads disaggregated for each load type.
Method 2: Switchboards/ motor control centers/ panelboard supply other distribution equipment with loads disaggregated for each load type.
Method 3: Branch circuits serve load types individually and provisions for adding future branch circuit monitoring.
Method 4: Complete metering system measures and reports loads by type.
See Chapter 8 of the Nonresidential Compliance Manual for more detail on Compliance Methods.

H. VOLTAGE DROP

This table includes entirely new or complete replacement electrical power distribution systems, or alterations that add, modify or replace both feeders and branch circuits to demonstrate compliance with 130.5(c)/ 160.6(c). For alterations, only the altered circuits must demonstrate compliance per 141.0(b)2Pii/ 180.2(b)4Bviic.

01	02			03	04	05	
Electrical Service Designation/Description	Combined Voltage Drop on Installed Feeder/Branch Circuit Conductors Compliance Method			Location of Voltage Drop Calculations[1]	Sheet Number for Voltage Drop Calculations in Construction Documents	Field Inspector	
						Pass	Fail
New Service	☒	Voltage drop less than 5%	☐ Permitted by CA Elec Code (Exception to 130.5(c))*	In construction documents	E1.13.1	☐	☐

** NOTES: If "Permitted by CA Elec Code **" is selected under Compliance Method above, please indicate where the exception applies in the space provided below.*

[1] FOOTNOTES: Voltage drop calculations may be attached to the permit application outside the construction documents if allowed by the Authority Having Jurisdiction. Select "attached" if applicable. If calculations will be the responsibility of the installing contractor, select "Contractor Responsible".

J. ELECTRIC READY BUILDINGS

This section does not apply to this project.

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K. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-ELC-E - Must be submitted for all buildings

STATE OF CALIFORNIA
Electrical Power Distribution
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-ELC-E
Project Name: Samuel M. Gantner Elementary School	**Report Page:** (Page 6 of 6)
Project Address: 2801 W Vine St	**Date Prepared:** 12/3/2025

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Alex Batista	Documentation Author Signature:
Company: Optimized Energy & Facilities Consulting	Signature Date: 2025-12-03
Address: 5734 Lonetree Blvd	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Rocklin CA 95765	Phone: (916) 626-5518

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Alex Batista	Responsible Designer Signature:
Company: Optimized Energy & Facilities Consulting, Inc	Date Signed: 2025-12-03
Address: 5734 Lonetree Blvd	License: E23735
City/State/Zip: Rocklin CA 95765	Phone: 916-626-5518

PLEASE RECYCLE

AGENCY APPROVAL:

LODI USD

HMC DESIGN FOR GOOD Architects
3431-010-000
2101 CAPITOL AVENUE, SUITE 100,
SACRAMENTO, CA, 95816
916 368 7990 / www.hmcarchitects.com

ISSUE

Δ DESCRIPTION DATE

KEYNOTES

NOTES

OPTIMIZED ENERGY & FACILITIES CONSULTING, INC.
5734 Lonetree Boulevard, Rocklin, CA 95765
Office: (916) 626 5518 www.oefcinc.com

REGISTERED PROFESSIONAL ENGINEER
ALEXANDRE M BATISTA
No.E23735
EXP. 12-31-2025
STATE OF CALIFORNIA

FACILITY:
SAMUEL M. GANTNER ELEMENTARY SCHOOL
2801 W VINE ST,
LODI, CA 95242

PROJECT:
SAMUEL M. GANTNER ELEMENTARY SCHOOL - INC 1

SHEET NAME:
ENERGY COMPLIANCE

DSA SUBMITTAL

DATE: **12/09/2025** CLIENT PROJ NO:

SHEET:

E1.41.1

Samuel M. Gantner Elementary School - Inc 1

PROJECT MANUAL

Date: 12.09.2025

Project Number: 3431-010-100

Phase: DSA Submittal

Agency Number: 02-123780

HMC Architects DESIGN FOR GOOD

ARCHITECT

STRUCTURAL ENGINEER

MECHANICAL / PLUMBING ENGINEERS

ELECTRICAL ENGINEER

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SECTION 01 57 13 – EROSION CONTROL

PART 1 - GENERAL

1.01 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.02 SCOPE OF WORK

A. General: Provide all materials, equipment and labor necessary to furnish and install erosion and sediment control measures as required by the District supplied Storm Water Pollution Prevention Plan (SWPPP).

B. Storm Water Pollution Prevention Plan (SWPPP): A SWPPP has been prepared and is part of the contract documents. The contractor will be responsible for implementing and maintaining the SWPPP.

1.03 QUALITY ASSURANCE

A. General: Comply with State and local codes and regulations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Supply all material as shown and described on the SWPPP.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install all items necessary as shown on the SWPPP or as required by State and local agencies.

3.02 MAINTENANCE AND REMOVAL:

A. General: Maintain and repair existing and new erosion control facilities and BMP’s throughout the construction period. Remove silt build up as needed. Repair damage to earth slopes and banks. Erosion control measures shall be left in place for the duration of the project until landscaping is complete.

(Reserved for copyright notice as needed or required by each consultant)

B. Monitoring: The contractor shall provide monitoring of erosion control measures before and after storm events. Provide a daily log of construction activities and impact on erosion control measures. MUSD will employ a Qualified SWPPP Practitioner (QSP) to inspect the site as required by the State General Permit. Contractor shall update SWPPP continuously throughout construction period, and provide any changes to the Qualified SWPPP Developer (QSD). Daily log shall be available on site at all times.

C. Cleaning: Keep area clean of debris.

D. Removal: Remove all erosion control measures after landscaping is complete.

END OF SECTION-

(Reserved for copyright notice as needed or required by each consultant)

SECTION 01 81 13.71 - SUSTAINABLE DESIGN REQUIREMENTS - CALGREEN NON-RESIDENTIAL

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: General requirements and procedures for compliance with 24 CCR 11, California Green Building Standards Code (CALGreen).
   1. Some CALGreen requirements depend on product selections and may not be specifically identified as CALGreen requirements. Compliance with CALGreen requirements may be used as one criterion to evaluate substitution requests and comparable product requests.
   2. Some CALGreen requirements depend on Architect's design and other aspects of Project that are not part of the Work of the Contract.
   3. Additional CALGreen requirements not included in this specification apply to the Project.

1.02 DEFINITIONS

A. CALGreen: California Green Building Standards Code, including supplements in effect as of date of the Contract Documents unless otherwise indicated.
   1. Definitions that are part of CALGreen apply to this Section.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Respond to questions and requests from Architect about CALGreen requirements that depend on product selection or product qualities. Document responses as informational submittals.

B. When requested by enforcing agency submit substantiating documentation confirming compliance with CALGreen requirements.

C. Sustainable design submittals shall be identified and submitted separately from other submittals.

1.04 INFORMATIONAL SUBMITTALS

A. Sustainable Design Submittals:
   1. Documentation for Construction and Demolition Waste Management: Submit documentation complying with CALGreen for one of the following:
      a. Construction Waste Management Plan.
      b. Waste Management Company.

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c. Waste Stream Reduction Alternative.

2. IAQ testing report from testing and inspecting agency indicating results of IAQ testing and documentation that show compliance with IAQ testing procedures and requirements.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Construction and Demolition Waste Management: Achieve end-of-Project rates for salvage/recycling of not less than 65 percent of total nonhazardous solid waste generated by the Work. Comply with local construction and demolition waste management ordinance when it is more stringent.

B. Universal Waste: Universal Waste items such as fluorescent lamps and ballast, and mercury containing thermostats, as well as other California prohibited Universal Waste materials shall be disposed of properly and diverted from landfills.

C. Site-Clearing Waste: 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. If contamination by disease or pest infestation is suspected, contact the Country Agricultural Commissioner and follow its direction for recycling or disposal of the material.

2.02 MATERIALS

A. Provide products and procedures necessary to comply with CALGreen requirements in this Section. Although other Sections may specify some requirements that contribute to referenced CALGreen requirements, determine additional materials and procedures necessary to comply with CALGreen requirements indicated.

2.03 LOW-EMITTING MATERIALS

A. Adhesives and Sealants:

1. For field applications, adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, and caulks shall comply with VOC content limits of authorities having jurisdiction, or the following VOC content limits:
   a. Indoor Carpet Adhesives: 50 g/L.
   b. Carpet Pad Adhesives: 50 g/L.
   c. Outdoor Carpet Adhesives: 150 g/L.
   d. Wood Flooring Adhesive: 100 g/L.
   e. Rubber Floor Adhesives: 60 g/L.
   f. Subfloor Adhesives: 50 g/L.
   g. Ceramic Tile Adhesives: 65 g/L.

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h. VCT and Asphalt Tile Adhesives: 50 g/L.
i. Gypsum Board and Panel Adhesives: 50 g/L.
j. Cove Base Adhesives: 50 g/L.
k. Multipurpose Construction Adhesives: 70 g/L.
l. Structural Glazing Adhesives: 100 g/L.
m. Single-Ply Roof Membrane Adhesive: 250 g/L.
n. Other Adhesive Not Specifically Listed: 50 g/L
o. PVC Welding Compounds: 510 g/L.
p. CPVC Welding Compounds: 490 g/L.
q. ABS Welding Compounds: 325 g/L.
r. Plastic Cement Welding Compounds: 250 g/L.
s. Adhesive Primer for Plastic: 550 g/L.
t. Contact Adhesive: 80 g/L.
u. Special-Purpose Contact Adhesive (Contact Adhesive That Is Used to Bond Melamine Covered Board, Metal, Unsupported Vinyl, Rubber, or Wood Veneer 1/16 Inch or Less in Thickness to Any Surface): 250 g/L.
v. Structural Wood Member Adhesives: 140 g/L.
w. Top and Trim Adhesive: 250 g/L.
x. Metal-to-Metal Adhesives: 30 g/L.
y. Plastic Foam Adhesives: 50 g/L.
z. Adhesives for Porous Materials (except Wood): 50 g/L.
aa. Wood Glues: 30 g/L.
bb. Fiberglass Adhesives: 80 g/L.
cc. Architectural Sealants: 250 g/L.
dd. Nonmembrane Roof Sealants: 300 g/L.
ee. Roadway Sealants: 250 g/L.
ff. Single-Ply Roof Membrane Sealants: 450 g/L.
gg. Other Sealants: 420 g/L.
hh. Sealant Primers for Nonporous Substrates: 250 g/L.
ii. Sealant Primers for Porous Substrates: 775 g/L.
jj. Modified Bituminous Sealant Primers: 500 g/L.
kk. Other Sealant Primers: 750 g/L.

2. Prohibited Ingredients: Adhesives and sealants must not contain the following:
   a. Chloroform.
   b. Ethylene dichloride.
   c. Methylene chloride.
   d. Perchloroethylene.
   e. Trichloroehtylene.
3. Additional Requirements: Comply with additional requirements in CALGreen for aerosol adhesives, and small unit sizes of adhesives, and sealant or caulking compounds.

B. Paints and Coatings:

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1. For field applications, paints and coatings shall comply with VOC limits of California Air Resources Board (CARB) Architectural Coatings Suggested Control Measure (SCM) below, unless more stringent local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed shall be determined by classifying the coating as flat, nonflat, or nonflat-high gloss coating, based on its gloss.
    a. Flat Coatings: 50 g/L.
    b. Nonflat Coatings: 100 g/L.
    c. Nonflat - High Gloss Coatings: 150 g/L.
    d. Specialty Coatings:
        1) Aluminum Roof Coatings: 400 g/L.
        2) Basement Special Coatings: 400 g/L.
        3) Bituminous Roof Coatings: 50 g/L.
        4) Bituminous Roof Primers: 350 g/L.
        5) Bond Breakers: 350 g/L.
        6) Concrete Curing Compounds: 350 g/L.
        7) Concrete/Masonry Sealers: 100 g/L.
        8) Driveway Sealers: 50 g/L.
        9) Dry-Fog Coatings: 150 g/L.
        10) Faux Finishing Coatings: 350 g/L.
        11) Fire-Resistive Coatings: 350 g/L.
        12) Floor Coatings: 100 g/L.
        13) Form-Release Compounds: 250 g/L.
        14) Graphic Arts Coatings (Sign Paints): 500 g/L.
        15) High-Temperature Coatings: 420 g/L.
        16) Industrial Maintenance Coatings: 250 g/L.
        17) Low Solids Coatings: 120 g/L.
        18) Magnesite Cement Coatings: 450 g/L.
        19) Mastic Texture Coatings: 100 g/L.
        20) Metallic Pigmented Coatings: 500 g/L.
        21) Multi-Color Coatings: 250 g/L.
        22) Pretreatment Wash Primers: 420 g/L.
        23) Primers, Sealers, and Undercoaters: 100 g/L.
        24) Reactive Penetrating Sealers: 350 g/L.
        25) Recycled Coatings: 250 g/L.
        26) Roof Coatings: 50 g/L.
        27) Rust-Preventive Coatings: 250 g/L.
        28) Shellacs, Clear: 730 g/L.
        29) Shellacs, Opaque: 550 g/L.
        30) Specialty Primers, Sealers and Undercoaters: 100 g/L.
        31) Stains: 250 g/L.
        32) Stone Consolidants: 450 g/L.
        33) Swimming Pool Coatings: 340 g/L.
        34) Traffic Marking Coatings: 100 g/L.

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35) Tub and Tile Refinish Coatings: 420 g/L.
36) Waterproof Membranes: 250 g/L.
37) Wood Coatings: 275 g/L.
38) Wood Preservatives: 350 g/L.
39) Zinc-Rich Primers: 340 g/L.

2. Additional Requirements: Comply with additional requirements in CALGreen for aerosol paints and coatings.

C. Carpet Systems: All interior carpet materials, including cushion, shall comply with at least one of the following:
1. Carpet and Rug Institute's Green Label Plus program.
2. VOC-emission limits and testing requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2 (CDPH Standard Method v1.2).

D. Composite Wood Products: Composite wood products used on the interior or exterior of the building shall have formaldehyde emission rates not greater than the following specified by the California Air Resources Board (CARB), Air Toxics Control Measure (ATCM) for Composite Wood, as tested in accordance with ASTM E1333:
1. Hardwood Plywood (Veneer Core and Composite Core): 0.05 ppm.
2. Particleboard: 0.09 ppm.
3. Medium-Density Fiberboard More Than 5/16 Inch Thick: 0.11 ppm.
4. Medium-Density Fiberboard 5/16 Inch or Less in Thickness: 0.13 ppm.

E. Composite Wood Products, Tier 1: Composite wood products shall be approved by the California Air Resources Board (CARB), as no-added formaldehyde (NAF) based resins or ultra-low emitting formaldehyde (ULEF) resins.

F. Resilient Flooring Systems: Where resilient flooring is installed, at least 80 percent of floor area receiving resilient flooring shall meet the requirements comply with the following:
1. VOC-emission limits and testing requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2 (CDPH Standard Method v1.2).

G. Thermal Insulation: Thermal insulation products shall comply with VOC-emission limits and testing requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2 (CDPH Standard Method v1.2).

H. Thermal Insulation; Tier 1: Thermal insulation products shall comply with VOC-emission limits and testing requirements of the California Department of Public Health's

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"Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2 (CDPH Standard Method v1.2).

I. Acoustical Ceilings and Wall Panels: Acoustical ceilings and wall panels shall comply with VOC-emission limits and testing requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.2 (CDPH Standard Method v1.2).

PART 3 - EXECUTION

3.01 CONSTRUCTION WASTE MANAGEMENT

A. Construction and Demolition Waste Management: Achieve specified rates for waste management by one of the following:
   1. Construction Waste Management Plan: Where a local jurisdiction does not have a construction and demolition waste management ordinance that is more stringent, submit a construction waste management plan that includes the following:
      a. Identification of construction and demolition waste materials to be diverted from disposal by efficient usage, recycling, reuse on the Project or salvage for future use or sale.
      b. Determination of construction and demolition waste materials will be sorted on-site (source separated) or bulk mixed (single stream).
      c. Identification of diversion facilities where construction and demolition waste material collected will be taken.
      d. Specification of the amount of construction and demolition waste materials diverted shall be taken by weight or volume, but not by both.
   2. Waste Management Company: Utilize a waste management company that can provide verifiable documentation that the percentage of construction and demolition waste material diverted from the landfill complies with CALGreen.
   3. Waste Stream Reduction Alternative: The combined weight of new construction disposal that does not exceed two pounds per square foot of building area shall be deemed to meet the 65 percent minimum requirement as approved by the enforcing agency.

B. Enhanced Construction Waste Reduction; Tier 1: Any mixed recyclables that are sent to mixed-waste recycling facilities shall include a qualified third-party verified facility average diversion rate.

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3.02 CONSTRUCTION IAQ MANAGEMENT

A. Cover or close openings in ducts and other related air-distribution component openings with tape, plastic, sheet metal, or other approved method before beginning dust-producing operations and maintain until dust-producing operations are complete.

B. If Owner authorizes use of permanent heating, cooling, and ventilating systems during construction period, install MERV 8 filter media according to ASHRAE 52.2 at each return-air inlet for the air-handling system used during construction.
   1. Replace all air filters immediately prior to occupancy.

END OF SECTION

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SECTION 03 10 00 - CONCRETE FORMWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Formwork for cast-in place concrete with shoring, bracing and anchorage.

B. Openings for other work.

C. Form accessories.

D. Form stripping.

E. Related Sections:
   1. Section 03 20 00, Concrete Reinforcement.
   2. Section 03 30 00, Cast-In Place Concrete.

1.02 REFERENCE STANDARDS

A. Conform to current adopted reference standards as listed in Chapter 35 the 2022 California Building Code.

B. ACI 117 - Standard Tolerances for Concrete Construction and Materials.

C. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.

D. PS-1 - Construction and Industrial Plywood.

E. California Code of Regulations, Title 8 Subchapter 4. Construction Safety Orders, Article 29, Erection and Construction, Section 1717.

F. Chapter 19A, 2022 California Building Code.

G. APA - American Plywood Association Design and Construction Guide.

H. CCR - California Code of Regulations, Title 8, Subchapter 4, Construction Safety Orders.

I. Local AQMD - Air Quality Management District.

1.03 COORDINATION

A. Coordinate this Section with other Sections of work that require attachment of components to formwork.

B. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.

PART 2 - PRODUCTS

2.01 DESIGN REQUIREMENTS

A. Design, engineer and construct formwork, shoring and bracing to conform to Section 26.11, ACI 318. Resultant concrete to conform to required shape, line and dimension. Design of formwork is Contractor's responsibility.

B. The formwork shall be designed for the loads and lateral pressures outlined in Chapter 2 of ACI 347R, and lateral forces as specified by the CBC.

C. Forms shall be designed by a professional Structural engineer registered in the State of California.

D. Foundation concrete may be placed directly into neat excavations, provided foundation trench walls are stable as determined by Architect, subject to approval of DSA and Architect. In such case, minimum formwork indicated on drawings is mandatory to insure clean excavations immediately prior to and during placing of concrete.

2.02 FORM MATERIALS

A. Plywood: APA - MDO (Medium Density Overlay) Plyform, Group 1, Exterior, PS-1, for exposed surfaces. APA - BB (No-overlay) Plyform, Class 1, Exterior, PS-1 for unexposed surfaces.

B. Lumber: Douglas Fir species; construction grade with grade stamp clearly visible.

C. Form Ties: Removable metal of adjustable length, cone ends.

2.03 FORMWORK ACCESSORIES

A. Form Release Agent: Colorless non-staining liquid chemical agent, free of wax or oils which will not absorb water. Material shall comply with Local AQMD.

B. Corners: Chamfered type; maximum possible lengths.

C. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with Drawings.

3.02 EARTH FORMS

A. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.

3.03 ERECTION - FORMWORK

A. Erect formwork, shoring and bracing to achieve design requirements in accordance with requirements of ACI 318 Section 26.11.
   1. Calculations Required: Provide shoring required to protect all earth banks which cannot be sloped back, due to adjacent structures, walks, streets or property lines. Provide engineering calculations and drawings necessary to perform Work. Calculations to be sealed and signed by licensed California Structural Engineer.
   2. Where public areas such as sidewalks and streets are to be shored, drawings and calculations are to be submitted by Contractor to the city or governing agency for approval prior to beginning of any work.
   3. Contractor and/or his engineer assume and accept all responsibility for construction and safety of shoring.
   4. Upon completion of Work, shoring materials are to be removed from site at expense of Contractor. Certain steel and/or concrete materials may be left in place with written approval of Architect.

B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shoring. Conform to Title 8, Subchapter 4, Construction Safety Orders, CCR.

D. Align joints and make watertight. Keep form joints to a minimum.

E. Obtain approval before framing openings in structural members that are not indicated on Drawings.

F. Provide chamfer strips on external corners.

G. Surface irregularities, ACI 347R Class A, gradual or abrupt irregularities of 1/8 inch for exposed to view concrete. Class B, 1/4 inch for plaster cement finish.

3.04 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices and embedded items.

C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.05 INSERTS, EMBEDDED PARTS AND OPENINGS

A. Provide formed openings where required for items to be embedded in or passing through concrete work. No openings or embedded items permitted in structural slabs within 18 inches of columns. Conform to Section ACI 318 Section 26.11.

B. Locate and set in place items that will be cast directly into concrete.

C. Coordinate work of other Sections in forming and placing openings, slots, reglets, recesses, chases, sleeves, bolts, anchors and other inserts, whether indicated on the structural drawings or not.

D. Install accessories in accordance with manufacturer's instructions, straight, level and plumb. Ensure items are not disturbed during concrete placement.

3.06 FORM CLEANING

A. Clean and remove foreign matter within forms as erection proceeds.

B. Clean formed cavities of debris prior to placing concrete.

C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

3.07 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 117.

3.08 FIELD QUALITY CONTROL

A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design and that supports, fastenings, wedges, ties and items are secure.

3.09 FORM REMOVAL

A. Conform to Chapter 26, Section 26.11, ACI 318.

B. Loosen forms carefully. Do not wedge pry bars, hammers or tools against finish concrete surfaces scheduled for exposure to view. Do not break-off corners.

C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms. Re-shoring permitted only after 10 days and prior to stripping.

END OF SECTION

SECTION 03 20 00 - CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fabricating and setting reinforcing steel and accessories for cast-in-place concrete.

B. Related Sections:
   1. Section 03 10 00, Concrete Formwork.
   2. Section 03 30 00, Cast-in-Place Concrete.

1.02 REFERENCE STANDARDS

A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of the Contract Documents.

B. ACI 315 - Details and Detailing of Concrete Reinforcing.

C. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.

D. ASTM International:
   1. ASTM 1064 - Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
   2. ASTM A615 - Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement.

E. CRSI - Concrete Reinforcing Steel Institute Manual of Practice.

F. Chapter 19A, 2022 California Building Code.

1.03 SUBMITTALS

A. Shop Drawings, indicating bar sizes, spacings, locations and quantities of reinforcing steel bending and cutting schedules and supporting and spacing devices.

1.04 QUALITY ASSURANCE

A. Provide Testing Laboratory with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.

B. Comply with the requirements of Division 01, General Requirements.

1.05 COORDINATION

A. Coordinate with placement of formwork, formed openings and other Work.

PART 2 - PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615, deformed billet steel bars, in grades as follows, and conforming to CBC 19A, Section 1903A.
   1. For No.4 and larger bars, use 60 ksi yield grade.
   2. For ties and stirrups, and No. 3 and smaller bars, use 40 ksi yield grade.

2.02 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16-gauge black annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.

C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel type; size and shape as required.

D. Concrete Blocks: Approximately 3 inches dimension each side.

2.03 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI Manual of Practice, ACI 315 and ACI 318. Wherever possible, make bends to shape in fabricator's shop.
   1. Bars reduced in section will not be accepted.
   2. Bars with kinks are unacceptable.
   3. Bars shall not be heated to facilitate bending or for any other purpose.
   4. Bars with bends not indicated on drawings will not be accepted. Perform no forming in a manner which will damage bars.
   5. Rebending of bars prohibited.

B. Locate reinforcing splices not indicated on Drawings at point of minimum stress.

PART 3 - EXECUTION

3.01 PLACEMENT

A. General: Comply with CBC and CRSI's "Manual of Standard Practice" for placing reinforcement.

B. Place, support and secure reinforcement against displacement. Do not deviate from required position. Install concrete blocks to support reinforcement over grade. Rocks not permitted.

C. Do not displace or damage vapor barrier where vapor barrier is specified or indicated on drawings. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

D. Accommodate placement of formed openings.

E. Prior to placing, thoroughly clean reinforcement of all rust, dirt, dust, oil or any other material deleterious to bonding of concrete.

F. Accurately place and securely tie reinforcement with black annealed wire and securely hold in position during placing of concrete by means of precast concrete block supports. Point wire tie ends away from the form. Unless otherwise indicated, the number, type, and spacing of supports shall conform to the ACI 315.
   1. Tie reinforcement splices and intersections per CBC and CRSI, Chapter 10, General Principles for Placing, Splicing and Tying Reinforcing Bars.

G. During placing of structural concrete slabs, provide a full-time reinforcing steel placer to repair and replace reinforcing to its proper location. Provide additional chairs of the proper size available to place under bars displaced during the concrete pouring operation.

H. Dowels for Walls: Securely tie in place prior to placing of concrete. Do not place dowels in concrete after pour.

I. Conform to Section 20.6.1.3.1, ACI 318, California Building Code for concrete cover over reinforcement.

END OF SECTION

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cast-in-place concrete.

B. Concrete curbs for walls, floors and slabs on grade, footings.

C. Control, expansion and contraction joint devices associated with concrete work including joint sealants.

D. Concrete for curbs, gutter, sidewalks, stairs and ramps and other site-related concrete is specified in Section 32 13 13.

E. Related Sections:
1. Section 03 10 00, Concrete Formwork.
2. Section 03 20 00, Concrete Reinforcement.
3. Section 07 92 00, Joint Sealants.
4. Section 32 13 13, Sitework Concrete.

1.02 REFERENCE STANDARDS

A. Conform to current adopted reference standards by date of issue of the current code cycle and the date of Contract Documents.

B. CBC - 2022 California Building Code
1. CBC Chapter 19A, Concrete

C. ADA - Americans with Disabilities Act of 1990, as amended
1. ADA Standards - ADA Title [II] [III] Regulations and the 2010 ADA Standards for Accessible Design.

D. American Concrete Institute:
1. ACI 224R - Control of Cracking in Concrete Structures.
2. ACI 224.3R - Joints in Concrete.
3. ACI 301 - Structural Concrete for Buildings.
4. ACI 318 - Building Code Requirements for Structural Concrete and Commentary

E. ASTM International:
1. ASTM C33 - Concrete Aggregate.
2. ASTM C150 - Portland Cement.
3. ASTM C171 - Sheet Materials for Curing Concrete.
4. ASTM C330 - Lightweight Aggregates for Structural Concrete.
5. ASTM C 311 - Standard Methods of Sampling and Testing Fly Ash and Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete.
6. ASTM C618 - Coal Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Concrete.
7. ASTM C856 - Petrographic Examination of Hardened Concrete.
8. ASTM C1107 - Packaged Dry, Hydraulic - Cement Grout (Nonshrink).
9. ASTM E1155 - Standard Test Method for Determining Floor Flatness and Levelness using the F-Number System.
10. ASTM C567 - Unit Weight of Structural Lightweight Concrete.
11. ASTM C1116 - Specification for Fiber-Reinforced Concrete.
12. ASTM D1751 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Bituminous Type).
13. ASTM E96 - Water Vapor Transmission of Materials.
14. ASTM F1869 - Test Method for Measuring Moisture Vapor Emission.
15. ASTM F2170 - Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes.

F. DSA IR 19-3 Interpretation of Regulations, Fly Ash and Natural Pozzolans Used in Concrete.

G. CSS - Caltrans Standard Specifications, Latest Edition.

1.03 SUBMITTALS

A. Placement Schedule: Submit for approval details and/or sketches showing location of each proposed construction joint. Do not deviate from locations of horizontal joints indicated on drawings.

B. Product data for each type of manufactured material and product included.

C. Design mix for each concrete mix.

D. Steel reinforcement shop drawings, including material, grade bar schedules, spacing, bent bar diagrams, arrangement and supports.

E. Submit contraction (crack control) joint, expansion, isolation and construction joint layout to Architect for approval.

F. Project Record Documents:

1. Accurately record actual locations of embedded utilities and components that are concealed from view.

2. Maintain an accurate record showing date and time of concrete placement in each portion of structure. Correlate placing record for test cylinders made by testing laboratory. Maintain a separate record giving date of removal of forms, shoring, including first and second halves and reshoring, if used. Keep records available for inspection at site. Upon completion, deliver two copies of each to Architect in approved form.

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with Section 1905A.1.16, California Building Code, and ACI 318 Section 26.12.

B. Maintain one copy of all records.

C. Acquire cement and aggregate from same source for all work.

D. Conform to ACI 318 Section 26.5.5, when concreting during hot weather. No concrete placement permitted above 90 degrees Fahrenheit.

E. Conform to ACI 318 Section 26.5.4 when concreting during cold weather. No concrete placement permitted below 50 degrees Fahrenheit.

F. Installer Qualifications, Concrete [Stain] [Color]: Minimum 5 years experience with installing stain and color products specified, certified and approved by the manufacturer.

1.05 COORDINATION

A. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I or II. Portland Cement Type, conforming to Section 1903A, California Building Code.

B. Aggregates:
   1. Aggregate for Stone Concrete: ASTM C33.
   2. Aggregate for Lightweight Concrete: ASTM C330.

C. Conform to requirements specified herein for maximum size of aggregate permitted in individual applications.

D. Water, ASTM C1602: Clear, from potable source, and not detrimental to concrete.

E. Fly Ash:
   1. Fly ash: may be used at 25% replacement of the Portland cement, at a 1:1 replacement ratio by weight. The fly ash shall meet the requirements of ASTM C 618 with the exception that the Loss on Ignition (LOI is a measure of the loss in mass of a fly ash sample when placed in a 750 degrees C oven) shall not exceed 1.0%. Only Class F material is permitted, CBC Section 1903A.6.
   2. When fly ash is used the quantity of water shall be determined on a water-cement plus fly ash basis.

2.02 ACCESSORIES

A. Concrete Formwork: In accordance with Section 03 10 00.

B. Reinforcement: In accordance with Section 03 20 00.

C. Bonding Agent: ASTM C631, Polyvinyl Acetate Latex emulsion; HIBOND, manufactured by Lambert Corporation, Orlando FL, LOCK BOND NO. 906, manufactured by Macklanburg-Duncan Co., City of Industry, CA, or equal.

D. Curing Film: ASTM C171; 10 mil thick, clear polyethylene film, single sheet, manufactured from virgin resin with no scrap or additives, free of visible defects, uniform in appearance, conforming to the following:
   1. Moisture Loss: 0.055 g per sq. cm.
   2. Tensile Strength: 1700 psi longitudinal, 1200 psi transverse.
   3. Elongation: 225 percent longitudinal, 350 percent transverse.

E. Non-Shrink Grout: ASTM C1107, Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 5,000 psi in 24 hours and 8,000 psi in 7 days; of consistency suitable for application and a 30-minute working time.

F. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8" and that can be feathered at edges to match adjacent floor elevations. Products by Tile-Tex by Flintkote Co., Webtex #60 or Fixallatex by Dowman Products Co or equal.

G. Interior/Exterior Compound: ARDEX TILT WALL PATCH or equal as approved in accordance with Division 01 for substitutions., cementitious surface treatment for filling and smoothing interior and exterior vertical concrete surfaces prior to sealing or painting.

H. Waterstops: Flexible PVC type, factory-installed metal eyelets for embedding in concrete to prevent passage of fluids through joints, factory-fabricated corners, intersections and directional changes. Flat serrated [Serrated] or dumbbell without centerbulb for contraction (non-working joints) [for expansion (working joints)] joints, 6 inches, 1/4-inch-thick, unless noted otherwise on drawings. By Greenstreak/Sika, Inc. St. Louis, Missouri, BoMetals Inc. Powder Springs, GA or equal.

I. Waterstops: Flexible strip, active bentonite/butyl rubber waterstop field installed in concrete to prevent passage of fluids through joints, RX 101 or RX 102 unless noted otherwise on drawings. By Waterstop-RX by Building Materials Group, Greenstreak/Sika, Inc. St. Louis or equal.

J. Secondary Reinforcement (shrinkage control): Synthetic-fiber-reinforced concrete contains virgin homopolymer polypropylene. Fibrillated polypropylene fibers engineered and designed for use in concrete, complying with ASTM C1116, Type III, 1/2 to 1-1/2 [1-1/2 to 2] inches long by the Forta Corporation, GCP Applied Technologies or equal. Dosage: 1.5 lbs per cubic yard of concrete [0.2%, 3.0 lbs/cu.yd] [0.33%, 5.0% lbs/cu.yd.]

2.03 JOINT DEVICES AND FILLER MATERIALS

A. Fiber Expansion Joint Filler - ASTM D1751: Closed cell, 1/2 inch max. thick; FIBER EXPANSION JOINT by American Highway Technology, Kankakee, IL, FIBRE EXPANSION JOINT or DECK-O-FOAM by W. R. Meadows, Dayton Superior or approved equal.

B. Expansion Joint Top: Integral extruded polystyrene plastic; 1/2 inch thick, with removable top strip exposing sealant trough, JOINT CAPS manufactured by The Burke Company, or equal.

C. Primer: As recommended by sealant manufacturer.

D. Joint Backing: ASTM C1330, Cylindrical, Type C, closed cell, polyethylene backer rod; oversized 30 to 50 percent larger than joint width. Green Rod by Nomaco Inc. or equal.

E. Sealant: Polyurethane two-component type, self-leveling, for level surface application, UREXPAN NR-200 or DYNATRED for sloped surfaces, manufactured by Pecora Corp., Harleysville PA, or equal. Color shall be selected by Architect.

F. Saw-Cut Joint Filler: Two-component epoxy resin, gray color, non-hardening, self-leveling, SIKADUR 51 (SL), by Sikacorp., Lyndhurst, NJ, or equal.

2.04 CONCRETE MIX

A. Mix and deliver concrete in accordance with ACI 318 Sections 26.4 and 26.5. Deliver concrete in transit mixers only. Discharge loads in less than 1-1/2 hours after water is first added.
   1. Design Mix: Conform to Section ACI 318 Chapter 26 for Proportioning on the basis if field experience or trial mixtures method.
   2. Conform to ACI 318, Section 26.4 for Selection of concrete proportions method. Selection of concrete proportions and ingredients for design mix by a DSA [OSHPD] approved Testing Laboratory and certified by a registered civil engineer licensed in California.
   3. Do not exceed 0.45 water-cement ratio by weight for floor slabs and for other concrete.

B. Select proportions by volume for concrete in accordance with the approved design mix.
   1. Required Strength: As noted on the structural drawings and below.
   2. Grout Mix: 1:3:2 Portland Cement, to sand, to pea gravel, minimum 2000 psi at 28 days.

C. Provide concrete to the following criteria:

Element	Min 28 day Strength PSI	Max Slump	Max Size Aggregate	Type
Grade Beams and Foundations	4,000	4 inch	1 inch	Normal wt. Concrete
Flr. Slabs on grade	4,000	4 inch	3/4 inch	Normal wt. Concrete
Other	3,000	4 inch	3/4 inch	Normal wt. Concrete

D. Do not use admixtures containing chlorides.

2.05 GRANULAR FILL

A. Crushed Aggregate Base (capillary break): 3/4 inch maximum grading, crushed rock and rock dust conforming to requirements of Section 200-2.2, SSPWC, with 3/8 inch sieve requirement waived, or Class 2 Aggregate Base as defined in Section 26, CSS.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify site conditions.

B. Verify requirements for concrete cover over reinforcement.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely and will not cause hardship in placing concrete.

3.02 PREPARATION

A. Prepare previously placed concrete by cleaning with sandblasting to remove laitance and expose clean aggregate.

B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

C. When approved by the Architect, clean previously placed concrete with steel brush and apply bonding agent in accordance with manufacturer's instructions.

D. Under Interior Slabs on Grade: Install 4 inches thick crushed aggregate base per Section 200-2.2, SSPWC or Class 2 CCS as capillary break. Over aggregate base place 15-mil vapor retarder in largest practical sections. Seal all 6-inch lapped seams, penetrations and foundation perimeters using manufacturer-approved tape only and install per manufacturer instructions. Install pipe boots at pipe penetrations. [Install rigid insulation]. Install reinforcement and concrete as scheduled.

1. Tapes, mastics, sealants, and other products used with vapor retarder shall be from same manufacturer as, and certified compatible with, vapor retarder.

E. Install steel reinforcing per Section 03 20 00. Place concrete slab as scheduled.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 318, Section 26.5.2. Remove loose dirt from excavations.

B. Notify Architect minimum 24 hours prior to commencement of operations. All excavations, forms and reinforcing shall be inspected and approved by the Architect prior to placement.

C. Ensure reinforcement, inserts, embedded parts, formed joint fillers, joint devices and accessories are not disturbed during concrete placement.

D. Install joint fillers, primer and sealant in accordance with manufacturer's instructions.

E. When detailed on the drawings, separate slabs on grade from vertical surfaces with 1/2 inch thick joint filler.

F. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface using two-component polyurethane sealant as specified in Section 07 92 00.

G. Install joint devices in accordance with manufacturer's instructions as detailed.

H. Install construction joint device in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

I. Maintain joint device in correct position to allow joint cover flush with finish.

J. Install joint covers in longest practical length.

K. Place concrete continuously between predetermined expansion, control and construction joints.
   1. Install expansion joints at vertical concrete walls at 24 feet on center unless noted otherwise on drawings.

L. Do not interrupt successive placement; do not permit cold joints to occur.

M. Avoid segregation of materials. Perform vibrating so as to produce a dense, smooth application free of rock pockets and voids. Do not use vibrators to move concrete horizontally.

N. Provide special mix prepared by the Testing Laboratory and approved by the Architect utilizing smaller aggregates in areas of reinforcing congestion to prevent the formation of rock pockets.

O. The unconfined vertical drop of concrete shall not be greater than 5 feet. Do not allow concrete to fall free from any height that will cause materials to segregate. Maximum

height of free fall permitted in any case: 5 feet. Utilize trunks or additional chutes where doubt occurs. Conform to requirements of ACI 318, Section 26.5.2.

P. Construction Joints: Wash surface of each joint shortly after pouring to expose clean, sound aggregate. Sandblast surface to remove laitance remaining or loose aggregate as approved by the Architect. Conform to ACI 318, Section 26.5.6. Apply bonding agent in accordance with manufacturer's instructions. Locate joints within the middle third of spans of slabs, beams and girders. Coincide construction joints with contraction, isolation, or expansion joints when possible. Locate where they lease affect the structural integrity of the element under consideration and are compatible with building’s appearance.

Q. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/8 inch in 10 ft. Slope floors for drains.

R. Contraction Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch, place joints at column lines and at 12 ft. o.c. each way, maximum. Remove groover tool marks on exposed concrete surfaces. Contractor’s option: Saw cut joints, early-entry dry-cut, per ACI 302.1R.

S. Saw cut slabs when indicated on drawings or as approved by Architect at 12 ft. on center, within 4-12 hours after placing concrete. Saw cut joints with power saws equipped with shatterproof abrasive re diamond-rimmed blades, cut 1/8 " wide joint into concrete when cutting action will not tear, abrade, or otherwise damage surface. Cut no deeper than 1/4 depth of slab thickness. Fill cuts with non-hardening epoxy. Completely fill cut to surface of slab. Sawing and timing: "early-entry dry-cut ", per ACI 302.1R. Section 8.3.12.

T. Isolation Joints: preformed joint filler depth of slab, fill top 1/2 inch with elastomeric sealant per Section 07 92 00. Locations: at columns, footings, and as noted on drawings.

U. Steel Pan Stairs: Install safety nosings at each tread, all steel pan stairs.

V. Surface irregularities, ACI 347R Class A, gradual or abrupt irregularities of 1/8 inch for exposed to view concrete. Class B, 1/4 inch for plaster cement finish.

3.04 FINISH AT ALL EXPOSED SURFACES

A. Refer to Section 03 20 00, Concrete Formwork.

3.05 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical injury.

B. Maintain concrete with minimal moisture loss at above 50 degrees F temperature for period necessary for hydration of cement and hardening of concrete. Dusting with dry cement to absorb excess water is prohibited.

C. Cure floor surfaces only as specified herein and in accordance with Section 1905A.11, California Building Code. Liquid membrane curing compound method not permitted for interior cast-in-place concrete slabs.

D. Moisture Retaining Coverings: spread polyethylene film over floor slab areas, lapping edges and sides, minimum 6 inches and sealing with pressure sensitive tape; cover with plywood or otherwise protect film from damage; maintain in place for minimum of seven (7) day unless noted otherwise on the drawings. Do not permit traffic over floor slabs during the curing period.

E. Vertical Surfaces: Spray water over surfaces and maintain wet for 10 days.

F. Quality Control: Proper curing of concrete surfaces shall be the responsibility of the Contractor under this section.

3.06 FIELD QUALITY CONTROL

A. Provide free access to Work and cooperate with Testing Laboratory.

B. Measure floor and slab flatness and levelness according to ASTM E1155 within 72 hours of finishing.

C. Proposed mix design of each class of concrete shall conform to ACI 318, Section 26.4, California Building Code and shall be approved by the Architect prior to commencement of work.

3.07 PATCHING

A. Architect will inspect concrete surfaces and determine imperfections, if any.

B. Patch imperfections as approved and in accordance with ACI 301.
   1. Clean all exposed concrete surfaces and all adjoining work stained by leakage of concrete. Remove all fins, butts and projections by grinding. Patch voids, rock pockets, holes, cracks and similar imperfections by chipping loose concrete and exposing clean, sound aggregate.

2. Fill cone form tie recesses with portland cement mortar flush to finish surface.

3.08 PROTECTION FOR EXPOSED CONCRETE TO BE TREATED OR SEALED

A. Protection. There is no known satisfactory chemical or cleaning procedure is available to remove petroleum stains from the concrete surface. Protect the concrete floor until ready for treatment/sealing.
   1. All hydraulic powered equipment must be diapered to avoid staining of the concrete.
   2. No trade shall park vehicles on interior slabs. If necessary to complete their scope of work, drop cloths shall be placed under vehicles at all times.
   3. No pipe cutting machine shall be used on interior slabs.
   4. Steel shall not be placed on interior slabs to avoid rust staining.
   5. All equipment must be equipped with non-marking tires.

B. Flooring shall be protected as follows: Use "Ram Board Plus ", Burbank, CA. "Builder Board with Liquid Shield " by Surface Shields, Oakland Park, ILL, or equal.
   1. Ram Board: Heavy Duty temporary floor protection membrane, 38 " wide x 100' rolls, 46 mils thick.
   2. Protect entire floor where area anticipated to be affected. Submit layout of protected area to Architect for approval.
   3. Loose lay protection material over floor area; tape all seams; do not tape or otherwise attach to floor; follow manufacture's installation requirements.
   4. Take other precautions as necessary to prevent damage in addition to requirements above, refer to Section 03 35 00 [03 35 43]. Submit to Architect for approval.

3.09 DEFECTIVE CONCRETE

A. Defective Concrete: Remove concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by the Architect.

C. Do not patch, fill, touch-up, repair or replace exposed concrete except upon express approval of Architect for each individual area.

3.10 MOISTURE TEST FOR CONCRETE FLOORS

A. It shall be the Contractor's responsibility to provide a concrete floor slab meeting the maximum moisture vapor emissions here-in specified and the Contractor shall exercise care in all aspects of mixing, placing, and curing the concrete floor slabs so that a minimum of mitigation treatment will be required.

B. Prior to ordering adhesives applied floor covering materials or coatings, conduct Calcium-Chloride Test Method in accordance with ASTM F1869 and ASTM F2170 to

verify that concrete floor slabs are dry with maximum moisture vapor emissions of 3 pounds per 1,000 square feet in 24 hours and that slabs exhibit negative alkalinity, carbonation or dusting. Apply the moisture test in four (4) different areas of each floor location, with at least one test for each 1,000 square feet of floor area.

C. Prior to ordering adhesive-applied floor covering materials or coatings, conduct Relative Humidity Test Method in accordance with ASTM F1869 and ASTM F2170 to verify relative humidity and surface pH of concrete floor slabs, the method
   1. Requires drilling holes at diameter not to exceed outside diameter of probe by more than 0.04 inch to depth equal to 40 percent of slab's thickness (elevated structural slab shall be tested at depth equal to 20 percent of slab thickness).
   2. Place probe to full depth of test hole, place cap over probe.
   3. Permit test site to acclimate, or equilibrate, for 72 hours prior to taking relative humidity readings.
   4. Remove cap and press button on the probe to obtain reading.
   5. Relative humidity readings for substrates receiving non-permeable flooring are 75% or lower.
   6. Testing shall require 3 tests in first 1,000 square feet, with one additional test per each additional 1,000 square feet of concrete slab surface.

D. Alkalinity Testing: Concrete floors shall be tested for alkalinity prior to the installation of adhesive-applied floor covering materials or coating. Levels of pH shall not exceed the written recommendations of the flooring covering manufacturer or the adhesive manufacturer, or both.

E. The test area should be at the same temperature and humidity expected during normal use, minimum testing conditions shall be 75+ 10 degrees F. and 50+ 10% relative humidity. Maintain these conditions 48 hours prior to, and during testing.

F. Install Concrete Slab Vapor Emission Treatment as specified in Section 09 05 61. Submit results to Architect of testing.

END OF SECTION

SECTION 03 30 53 - MISCELLANEOUS CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture.

1.03 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

B. Comply with ACI 301.

PART 2 - PRODUCTS

2.01 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.

C. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.

D. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

2.02 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout Project:
   1. Portland Cement: ASTM C 150,.

B. Normal-Weight Aggregate: ASTM C 33, graded, nominal maximum aggregate size.

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C. Water: ASTM C 94/C 94M.

2.03 ADMIXTURES

A. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.04 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth or cotton mats.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

2.05 CONCRETE MIXTURES

A. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301, as follows:
1. Minimum Compressive Strength: at 28 days.
2. Maximum Water-Cementitious Materials Ratio: .

2.06 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
1. When air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

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PART 3 - EXECUTION

3.01 STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.02 CONCRETE PLACEMENT

A. Comply with ACI 301 for placing concrete.

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

C. Do not add water to concrete during delivery, at Project site, or during placement.

D. Consolidate concrete with mechanical vibrating equipment.

3.03 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:
   1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
   2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.

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Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.04 REPAIRS

A. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION

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SECTION 03 48 00 - PRECAST CONCRETE SPECIALTIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Dimensional characters.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. For precast concrete units, include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Show fabrication and installation details for precast concrete units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.

C. Samples for Verification:
   1. For each color and texture of precast concrete required, 4 inches square in size.

1.03 QUALITY ASSURANCE

A. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 117, "Manual for Quality Control for Plants and Production of Precast Concrete Products."

1.04 DELIVERY, STORAGE, AND HANDLING

A. Coordinate delivery of precast concrete to avoid delaying the Work.

B. Pack, handle, and ship precast concrete units in suitable packs or pallets.
   1. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move precast concrete units if required, using dollies with wood supports.
   2. Store precast concrete units on wood skids or pallets with nonstaining, waterproof covers, securely tied. Arrange to distribute weight evenly and to prevent damage to units. Ventilate under covers to prevent condensation.

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1.05 PROJECT CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements in TMS 602.
   1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until precast concrete has dried, but no fewer than seven days after completing cleaning.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements in TMS 602.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations for Precast concrete: Obtain each type of precast concrete unit from single source from single manufacturer.

2.02 PRECAST CONCRETE MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or Type III, containing not more than 0.60 percent total alkali when tested according to ASTM C114. Provide natural color or white cement as required to produce precast concrete color indicated.

B. Coarse Aggregates: Granite, quartz, or limestone complying with ASTM C33/C33M; gradation and colors as needed to produce required precast concrete textures and colors.

C. Fine Aggregates: Natural sand or crushed stone complying with ASTM C33/C33M, gradation and colors as needed to produce required precast concrete textures and colors.

D. Color Pigment: ASTM C979/C979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

E. Reinforcement:
   1. Deformed steel bars complying with ASTM A615/A615M, Grade 40. Use galvanized or epoxy-coated reinforcement when covered with less than 1-1/2 inches of precast concrete material.
      a. Epoxy Coating: ASTM A775/A775M.
      b. Galvanized Coating: ASTM A767/A767M.
   2. Galvanized-Steel, Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from galvanized-steel wire into flat sheets.

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F. Embedded Anchors and Other Inserts: Fabricated from stainless steel complying with ASTM A240/A240M, ASTM A276/A276M, or ASTM A666, Type 304.

2.03 FABRICATION

A. Reinforce precast concrete units to resist handling, transportation, and erection stresses and specified in-place loads.

B. Comply with requirements in PCI MNL 117 and requirements in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.

C. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming in precast concrete units.

D. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air voids on surfaces. Use equipment and procedures complying with PCI MNL 117.
1. Place self-consolidating concrete without vibration according to PCI TR-6, "Interim Guidelines for the Use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants."

E. Cure concrete, according to requirements in PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.

F. Discard and replace precast concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance.

2.04 PRECAST CONCRETE UNITS
1. Empire Precast.
2. Outdoor Creations, Inc.
3. Wausau Tile, Inc.
4. QCP Corp.

B. Precast Concrete Units:
1. Units are manufactured using the manufacturer's selected method.
2. Dimensional Characters: Sizes and configurations as indicated on Drawings.

C. Fabricate units with sharp arris and accurately reproduced details, with indicated texture on all exposed surfaces unless otherwise indicated.

D. Fabrication Tolerances:

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1. Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch.
2. Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch, whichever is greater, but in no case by more than 1/4 inch.
3. Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch, whichever is greater.
4. Location of Grooves, False Joints, Holes, Anchorages, and Similar Features: Do not vary from indicated position by more than 1/8 inch on formed surfaces of units and 3/8 inch on unformed surfaces.

E. Exposed faces shall be free of joint marks, grain, and other obvious defects. Corners, including false joints shall be uniform, straight, and sharp. Finish exposed-face surfaces of precast concrete units as follows:
1. As-Cast Surface Finish: Provide surfaces to match approved sample for acceptable surface, air voids, sand streaks, and honeycomb.

F. Colors and Textures: Custom colored as selected by Architect.

2.05 ACCESSORIES

A. Anchors: Type and size indicated, fabricated from Type 304 stainless steel complying with ASTM A240/A240M, ASTM A276/A276M, or ASTM A666.

B. Dowels: 1/2-inch- diameter round bars, fabricated from Type 304 stainless steel complying with ASTM A240/A240M, ASTM A276/A276M, or ASTM A666.

C. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by precast concrete manufacturer and expressly approved by cleaner manufacturer for use on precast concrete and adjacent masonry materials.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

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3.02 SETTING ANCHORED PRECAST CONCRETE

A. Set precast concrete as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.
   1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
   2. Shim and adjust anchors, supports, and accessories to set precast concrete in locations indicated with uniform joints.

3.03 INSTALLATION TOLERANCES

A. Variation from Plumb: Do not exceed 1/4 inch in 10 ft., , or 1/2 inch maximum.

B. Variation from Level: Do not exceed 1/4 inch in 10 ft., , or 1/2 inch maximum.

C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches or one-fourth of nominal joint width, whichever is less.

3.04 ADJUSTING AND CLEANING

A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Precast concrete may be repaired if methods and results are approved by Architect.

B. Replace units in a manner that results in precast concrete matching approved Samples, complying with other requirements, and showing no evidence of replacement.

C. In-Progress Cleaning: Clean precast concrete as work progresses.

END OF SECTION

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SECTION 04 22 00 – REINFORCED UNIT MASONRY SYSTEM

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Reinforced concrete masonry units (CMU).
   2. Colored mortar.

1.02 RELATED REQUIREMENTS

A. Section 01 45 23, Testing & Inspection Services.

B. Section 01 61 16, Volatile Organic Compound (VOC) Restrictions; for VOC limits pertaining to adhesives, sealants, fillers, primers, and coatings.

C. Section 01 81 13, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

D. Section 03 20 00, Concrete Reinforcing.

E. Section 03 30 00, Cast-In-Place Concrete.

F. Section 05 12 00, Structural Steel Framing.

G. Section 07 19 00, Water Repellants.

H. Section 07 92 00, Joint Sealants.

I. Section 09 91 00, Painting.

J. Section 09 96 23, Graffiti-Resistant Coatings.

1.03 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings.

B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings.

C. American Concrete Institute (ACI):
   1. 315R: "Guide to Presenting Reinforcing Steel Design Details."

D. ASTM International (ASTM):

1. A307: Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
2. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
3. A653/A653M: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
4. C5: Standard Specification for Quicklime for Structural Purposes.
5. C90: Standard Specification for Loadbearing Concrete Masonry Units.
6. C144: Standard Specification for Aggregate for Masonry Mortar.
7. C150/C150M: Standard Specification for Portland Cement.
8. C207: Standard Specification for Hydrated Lime for Masonry Purposes.
9. C270: Standard Specification for Mortar for Unit Masonry.
10. C404: Standard Specification for Aggregates for Masonry Grout.
11. C426: Standard Test Method for Linear Drying Shrinkage of Concrete Masonry Units.
12. C476: Standard Specification for Grout for Masonry.
13. C595/C595M: Standard Specification for Blended Hydraulic Cements.
14. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
15. C989/C989M: Standard Specification for Slag Cement for Use in Concrete and Mortars.
16. C1019: Standard Test Method for Sampling and Testing Grout for Masonry.
17. F1554: Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

E. The Masonry Society (TMS):
   1. 402/602: Building Code Requirements and Specification for Masonry Structures.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:
   1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 33 00, Submittal Procedures.
   2. Closeout Submittals shall be submitted in accordance with Section 01 77 00, Closeout Procedures.
   3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 81 13, Sustainable Design Requirements.

B. Pre-installation Meeting: Convene meeting at Project site to be attended by Owner's Representative, Contractor, Architect, Structural Engineer, Project Inspector and Special Inspector at least one week prior to scheduled commencement of masonry mockup construction and associated work.
   1. Notify attendees not less than 5 business days prior to the established meeting date.
   2. Discussion is to include, but not limited to, the following:
      a. Requirements for the mockup, and confirmation of the location and construction of control / expansion joints.
      b. Testing and inspections required.

c. Means and methods that will be employed.
d. Cold weather and hot weather procedures, as applicable.
e. Items to be addressed prior to and during the work.
f. Protection of adjacent surfaces required.

3. At the Owner's option, a third-party expert in CMU construction may be invited.
4. Record discussions of meetings, decisions and agreements reached and furnish copy of record to each party attending.

1.05 ACTION SUBMITTALS

A. Shop Drawings:
1. To-scale drawings to illustrate detailing, fabrication, bending and placement of unit masonry reinforcing bars.
a. Comply with ACI 315R showing bar schedules, stirrup spacing, diagrams of bent bars and arrangements of masonry reinforcement.
b. Indicate location of conduit, plumbing and other items embedded in unit masonry walls in coordination with placement of reinforcement.
2. Bracing drawings and calculations where required by Section 3.3E of TMS 602, sealed by a professional engineer licensed in the jurisdiction where the project is being constructed, shall be submitted for record purposes.

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

C. Samples:
1. Initial Submittals:
a. Manufacturer's standard available colors for masonry units and grout for Architect's selection.
2. Confirmation Submittals: The following items shown to be conforming to selections made during review of initial submittals.
a. Full-size units for each different exposed CMU unit for review of texture and color.
b. Colored mortar for each selected color.

D. Mix Designs:
1. Mix designs and test results for mortar and grout conforming to requirements specified in TMS 602, Article 1.5.

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For installers.

B. Mill test reports for all reinforcing steel.

C. Certificates:

1. Material certificates for the following signed by the manufacturer and the Contractor certifying that each material complies with requirements and standards specified.
   a. Each material and grade of reinforcing bars. See Section 03 20 00, Concrete Reinforcement.
   b. Each type and size of anchors, inserts, ties and accessories.
2. Plant certificates for concrete masonry units to the Owner's Testing Agency and Architect stating that all units have been properly cured before shipment and that they conform to requirements of these Specifications, including but not limited to, requirements for moisture content per ASTM C90.

D. Extreme Weather Procedures: Cold and hot-weather construction procedures evidencing compliance with requirements specified in TMS 402/602 and these Specifications.

E. Record of Pre-installation Meeting.

F. Sustainable Design:
   1. General:
      a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
      b. Sustainable design submittals are in addition to other submittals.
   2. The following information shall be provided:
      a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 61 16.
      b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 61 16.

1.07 CLOSE OUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.08 QUALITY ASSURANCE

A. Installer Qualifications: Firms and people specified in Section 1.6 of TMS 602, to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, telephone numbers, names of Architects and Owners, and other information specified.

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

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

D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

E. Special Inspection: Coordinate with Owner's special inspector of building structural masonry construction in compliance with CBC Section 1705.4. See additional requirements specified under Article “Field Quality Control” in Part 3.

F. Mockup: Construct a sample panel of masonry wall types, including color and texture, having a minimum dimension of 6 feet by 6 feet, in the specified bond pattern, to be approved by Owner’s Representatives, Project Inspector and Architect.
   1. The mockup is to be built on a stable foundation as required to support the panel(s) during the duration of the project and is not to be an integral part of the construction and is to remain on site for comparison to the CMU installation, including cleaning, and the application of the water repellent and graffiti-resistant coating.
   2. Do not construct the mockup panel(s) prior to approval of submitted samples for texture and color.
   3. The assembly is to include, but is not necessarily limited to, the following as applicable to the project:
   a. Color, texture and accent banding.
   b. Reinforcing steel.
   c. Expansion joint, control joint, and sealant.
   d. Mortar joint type, color, tooling and workmanship.
   e. Tolerances of unit sizes, and level and plumb workmanship.
   f. Flashing, including cap flashing.
   g. Weep holes and end dams.
   h. Air and vapor barrier.
   4. After mockup is constructed and approved, the same cleaning procedure to be performed on the building is to be performed on the sample panel(s), leaving a portion un-cleaned.
   5. Upon approval of the mockup and cleaning, the water repellent and anti-graffiti coating shall be applied and cured as specified, followed by water testing in accordance with the manufacturer’s requirements.

1.09 PRECONSTRUCTION TESTING

A. General:
   1. Refer to approved Testing and Inspection requirements.
   2. Owner will select a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services will be made by Owner.

B. Compressive Strength:
   1. Compliance with the requirements for the specified compressive strength of masonry, f’m, shall be provided in accordance with CBC Section 2105A.2 as well as the approved construction documents.
   2. Verification masonry to be supplied meets the specified compressive strength prior to the start of construction, determined in accordance with TMS 602 Article 1.4 A and 1.4 B.2.

C. Linear Shrinkage Tests:
   1. Linear shrinkage testing to be performed in accordance with ASTM C426. Test data shall be traceable to the units being supplied for the project and shall comply with ASTM C90.
   2. Linear shrinkage testing may be omitted if the maximum spacing of control joints does not exceed 25 feet.

1.10 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to the job in manufacturer's sealed containers, where applicable, and/or original bundles with tags and labels intact. Masonry units to be delivered and stored on pallets.

B. Store materials in protected, dry, clean conditions off the ground and in areas so as to not interfere with the progress of the work.

C. Transport, store and handle in strict accordance with the manufacturer’s recommendations.

1.11 FIELD CONDITIONS

A. Comply with TMS 602 Article 1.8 C for cold weather construction when ambient temperature will fall below 40 degrees F and TMS 602 Article 1.8 D for hot weather construction when ambient temperature will rise above 90 degrees F.

PART 2 – PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

A. Comply with TMS 402/602 and other requirements specified in this Section applicable to each material indicated.

B. Sustainable Design:
   1. VOC emissions for field-applied adhesives, sealants, and sealant primers must comply with limits specified in Section 01 61 16.
   2. VOC emissions for field-applied paints and coatings must comply with limits specified in Section 01 61 16.

2.02 MANUFACTURERS

A. Concrete Masonry Units: Basalite Concrete Products, Calstone Company, Angelus Block Company, or equal.

2.03 CONCRETE MASONRY UNITS

A. General: Comply with requirements indicated below applicable to each form of concrete masonry unit required.

1. Concrete masonry units shall be normal weight, grade N and shall comply with ASTM C90.
2. Size: Provide concrete masonry units complying with requirements indicated below for size that are manufactured to specified face dimensions within tolerances specified in the applicable referenced ASTM specification for concrete masonry units.
   a. Nominal Modular Size: 8 x 8 x 16 inches.
   b. Bond Beam Units: Single or double open end.
      1) Provide bond beam units at horizontal reinforcement.
      2) The depth of the bond beam channel below the top of the unit shall be a minimum of 1-1/2 inches and the width shall be 3 inches minimum.
      3) Provide 3 inches high by 3 inches wide minimum bond beam web openings.
3. Provide special units for 90-degree corners and lintels as detailed.
4. Caps: Match specified units in height as indicated on the Drawings.
   a. Height: 1-1/2 inches.
5. End Pieces: Match specified units.

B. Regular Hollow Load Bearing Units:
   1. Color: Standard gray. As selected by Architect from manufacturer's stock colors.
   2. Texture: Precision (smooth).
   3. Compressive Strength: Provide units with Minimum Design Compressive Strength (f'm) of 2,000 psi, and minimum unit net area compressive strength of 2,000 psi, or as indicated on the Drawings, whichever is greater.

C. Special Texture Units: Burnished face on all sides at exterior CMU walls.
   1. Use smooth face on interior side and at gate openings.
   2. Color: As selected by Architect from manufacturer's stock colors.

2.04 REINFORCEMENT AND ANCHORAGE

A. General: Provide reinforcing steel complying with requirements of Section 2.4 of TMS 602 and Section 03 20 00, Concrete Reinforcement.

B. Steel Reinforcing Bars: Carbon steel complying with ASTM A615/A615M, Grade 60.

C. Bar Positioners:
   1. Single Curtain: "RB Rebar Positioners" by Hohmann & Barnard, or equal.

2.05 MORTAR

A. Materials:
   1. Cement: Portland cement, ASTM C150/C150M, Type I or II.
   2. Aggregate: Natural sand, complying with ASTM C144; white or light grey color, not less than 3 percent passing No. 100 sieve.
   3. Hydrated Lime: ASTM C207, Type S.
   4. Quicklime: ASTM C5, non-hydraulic type.
   5. Lime Putty: Make from quicklime or hydrated lime.

a. If quicklime is used, shake and screen through sieve having 15 or more meshes per linear inch.
b. Store under protection for at least 10 days before use.
c. Lime putty shall have a unit weight of at least 83 pcf.

6. Color Additive: Mineral oxide pigment; color as selected by the Architect.
7. Water: Clean and fresh from public water system.

B. Mix: Type S in accordance with CBC Section 2103 and ASTM C270.
1. Do not use calcium chloride in mortar.
2. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with TMS 602 Article 2.6A.
3. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.
4. Do no use anti-freeze compounds to lower the freezing point of mortar.
5. Mortar shall be adjusted to satisfaction of mason, but only as much water shall be added as is compatible with convenience in using mortar.
a. If mortar begins to stiffen from evaporation or absorption of part of mixing water, mortar shall be re-tempered by adding water and re-mixing.
b. Mortar shall not be used after cement begins its final set, and in no case shall it be used more than two hours after original mixing.
6. When ambient air or masonry temperatures drop below 40 degrees F special provisions of TMS 602, Article 1.8C for cold weather construction shall apply. If temperatures rise above 90 degrees F, special provisions of TMS 602, Article 1.8D for hot weather construction shall apply.
7. Do not add air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, except as specified, without prior written approval of Structural Engineer.

2.06 GROUT

A. Grout shall consist of a mixture of cementitious materials and aggregate to which water has been added such that the mixture will flow without segregation of the constituents.

B. Materials:
1. Portland cement, ASTM C150/C150M, Type I or II.
2. Coarse Aggregate: ASTM C404, maximum aggregate size 3/8-inch.
3. Additives: Grout-enhancing shrinkage-compensating additive; “Sika Grout Aid” by Sika Corporation, or equal.
4. Water: Clean and fresh from public water system.

C. Mix: Conform to ASTM C476 for coarse grout with no lime.
1. General:
a. Thoroughly mix grout ingredients in quantities needed for immediate use.
b. Provide for uniformity of mix.
c. Grout shall not be used more than 90 minutes after initial mixing water has been added to dry ingredients.
d. Proportioning or mixing of grout on site is not permitted.

2. Compressive Strength: ASTM C1019; 2,000 psi minimum at 28 days.
   a. See Structural Drawings for specified grout strength.
   b. No water reducing admixtures will be approved.
3. Slump: 8 to 11 inches, W/C equal to or greater than 0.7.
4. Cementitious Replacement:
   a. Types:
      1) As permitted by ASTM C476, blended hydraulic cements meeting ASTM C595/C595M may be used.
      2) Fly ash or pozzolans may be used as cement replacements for 15 to 40 percent of the total weight of cementitious material. Fly ash shall be class F, meeting ASTM C618 requirements.
      3) Ground granulated blast furnace slab shall meet ASTM C989/C989M requirements.
   b. Grout with cementitious replacements shall provide minimum grout compressive strength specified at 28-day tests.
5. Mix shall contain specified grout aid admixtures added at a rate of 1 pound per 100 pounds of cementitious materials in accordance with manufacturer's recommendations.
   a. Regardless of whether grout is job-mixed or plant-mixed, admixture shall be added in accordance with manufacturer's requirements.
   b. Admixture must be combined with water to form a slurry which is then added to the mix in order to avoid "balling" and to get proper distribution of the admixture within the mix.
6. Do not add other admixtures, air-entraining agents, accelerators, retarders, water-repellent agents, and antifreeze compounds, except as otherwise specified, without prior written approval of Structural Engineer.
   a. Do not use calcium chloride in grout.
   b. Do not use anti-freeze compounds to lower the freezing point of grout.

2.7 EMBEDDED MATERIALS

A. Sheet Metal Flashing: Galvanized steel complying with ASTM A653/A653M, Z275 (G90) coating designation; structural quality, 0.0239 inch thick (24 gage), complying with additional requirements specified in Section 07 62 00, Sheet Metal Flashing and Trim.

B. Headed Anchor bolts: ASTM A307, Grade A.

C. Bent-Bar Anchors: ASTM F1554 Grade 36 galvanized steel with Class 1A threads

.

2.8 ADDITIONAL MATERIALS

A. Preformed Control Joints: Rubber or neoprene material; Hohmann & Barnard, or equal.
   1. Provide corner and tee accessories, heat or cement-fused joints.
B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self-expanding.

C. Building Paper: #30 asphalt saturated felt.

D. Nailing Strips: Softwood, preservative treated for moisture resistance, dovetail shape, sized to masonry joints.

E. Weep Holes: Cotton wick.

F. Cleaning Solutions: Non-acidic, not harmful to masonry work or adjacent materials designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry surfaces without discoloring or damaging masonry surfaces and without leaving any chloride residue; expressly approved for intended use by manufacturer of masonry units being cleaned; ProSoCo, Inc. or equal.

G. Bituminous Coating: Cold-applied asphalt mastic complying with SSPC Paint 12 except containing no asbestos fibers.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work:
   1. That foundation surface is level to permit the initial bed joint within a range of 1/4 to 1-1/4 inch.
   2. That edge is true to line to permit projection of masonry to less than 1/4 inch.
   3. That projecting dowels are free from loose scale, dirt, concrete or other bond-inhibiting substances.

B. Verify items provided by other Sections of work are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

D. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION AND PROTECTION

A. Direct and coordinate placement of metal anchors supplied to other Sections.

B. Provide temporary bracing during installation of masonry work. Maintain it in place until the building structure provides permanent bracing.

C. If rain is anticipated, cover the top of incomplete CMU construction as required to prevent moisture intrusion.
D. Protect face materials against staining.
E. Remove misplaced grout or mortar immediately.

F. Protect sills, ledges, off-sets and similar items from mortar drippings or other damage during construction.

G. Masonry units shall be free of dust and dirt.

3.03 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Lay concrete masonry units in running bond, unless otherwise indicated on project documents. Course one unit and one mortar joint to equal 8 inches.

D. Vertical cells to be filled shall have vertical alignment sufficient to maintain a clear, unobstructed, continuous vertical cell measuring not less than 3 inches by 3 inches.

E. Use open end units where vertical reinforcement occurs. Use bond beam or lintel units where horizontal reinforcement occurs.

F. Lay decorative units to coursing of one unit and one mortar joint to equal 8 inches. Form concave mortar joints.

3.04 PLACING AND BONDING

A. Lay hollow masonry units with face shell bedding on head and bed joints.

B. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.

C. Remove excess mortar as work progresses. Maximum mortar projection is limited to 1/4-inch. Clean out all mortar droppings.

D. Compact joint mortar solidly with tooling skate when mortar is thumbprint hard to form a watertight joint, free of voids, cracks, and pin holes:
   1. All Joints, Unless Otherwise Indicated: Concave.
   2. Interior Walls to be Painted, Inside Face of Utility Yard Walls: Flush.

E. Interlock intersections and external corners.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

H. Cut mortar joints flush where resilient base is scheduled.

I. All masonry shall be built to preserve the unobstructed vertical continuity of the cells to be filled. All head joints shall be solidly filled with mortar for a distance in from the face of the wall or unit not less than the thickness of the longitudinal face shells.

J. Walls and cross webs forming such cells to be filled shall be full bedded in mortar to prevent leakage of grout.

K. Unless otherwise indicated, bond shall be provided by lapping units in successive vertical courses.

L. At the time of laying, all masonry units shall be free of dust and dirt.

M. Remove and repoint all cracked or unbonded mortar joints.

3.05 MASONRY FLASHINGS

A. Lap end joints minimum 6 inches and seal watertight.

B. Use flashing manufacturer's recommended adhesive and sealer.

3.06 PLACEMENT OF REINFORCING

A. Reinforcing and wire ties shall be embedded in the grout.

B. Provide 1 bar diameter minimum clear space between masonry unit and reinforcing.

C. Horizontal reinforcing in bond beams to have a minimum grout cover of 1 inch.

D. Place reinforcing bars at locations indicated on structural drawings and secure in place.

E. Install reinforced masonry unit lintels over openings.

F. Reinforce openings as detailed on structural drawings.

G. Securely fasten reinforcing bars from displacement at intervals not exceeding 192 bar diameters. Maintain position within 1/2-inch of dimensioned position.

H. Lap splices in accordance with Structural Drawings and CBC 2107.2.1 or 2108.2.

I. Allow masonry lintels to attain specified strength before removing temporary supports.

3.07 PIPE, CONDUITS AND EMBEDDED ITEMS

A. No pipe shall be embedded in masonry work except rigid electrical conduit of 1-inch diameter or less. Pipe to be embedded in masonry shall be rigid and comply with the requirements for embedment shown on the Structural Drawings.

B. Embedded items shall be securely anchored against moving prior to grouting (i.e. no wet setting).

C. Bolts shall be accurately set with templates and held in place to prevent dislocation during grouting.

D. Reinforcement, embedded items, and bolts shall be solidly embedded in grout.

E. Anchor bolts in face shells shall maintain a minimum of 1/2-inch of grout and face shell.

3.08 GROUT PLACEMENT

A. All cells shall be grouted solid.

B. Place and consolidate grout fill without displacing reinforcing.

C. Grout shall be a workable mix suitable for placing without segregation and shall be thoroughly mixed.
   1. Grout shall be placed by pumping or an approved alternate method and shall be placed before initial set or hardening occurs.
   2. Grout shall be consolidated by mechanical vibration during placing and reconsolidated after excess moisture has been absorbed, but before workability is lost.
   3. The grouting of any section of a wall shall be completed in one day, with no interruptions greater than one hour.

C. Horizontal reinforcement shall be placed in bond beam units with a minimum grout cover of 1 inch above steel for each grout pour.

E. Unobstructed grout spaces no less than 2 inches x 3 inches in width with fine grout to be provided, and grout spaces no less than 3 inches x 3 inches in width with coarse grout to be provided.
   1. Increase minimum size by the width or diameter of obstructions including reinforcing and conduit.
   2. Grout shall be placed so that all spaces do not contain voids.

F. When grouting is stopped for more than one hour, terminate grout 1-1/2 inch minimum below top of upper masonry unit, except at bond beam 1/2-inch below top of upper masonry unit, to form a positive key for subsequent grout placement.

G. Grout shall not be handled with aluminum equipment, unless demonstrated that there will be no deleterious effects.

H. Grout Pours and Grout Lifts: Grout pours are to be per CBC 2104.1.3.5 and TMS 602, Article 3.5 C. Grout lifts are to be per CBC 2104.1.3.6 and TMS 602, Article 3.5 D.
   1. Grout Pours Not Exceeding 4 ft: Grout pours not exceeding 4 ft are to be per CBC 2104.1.3.5.1.

2. Grout Pours Exceeding 4 ft: Grout pours exceeding 4 ft are to be per CBC 2104.1.3.5.2, CBC 2104.1.3.5.3, and must be approved by the Architect. An approved admixture that reduces early water loss and produces an expansive action shall be used in the grout. Contractor shall submit a request to use “Grout Pours Exceeding 4 ft” in accordance with Section 01 33 00.

I. Wall Cap: Form and screed rounded mortar cap at all walls with exposed tops. Cap shall be level and smooth with minimum 1-inch rise at center of wall.

3.09 CONTROL AND EXPANSION JOINTS

A. Continue horizontal joint reinforcement through control and expansion joints, only as shown in the Drawings.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

C. Size control joints in accordance with Section 07 92 00 for sealant performance.

D. Form expansion joints as detailed.

3.10 BUILT-IN WORK

A. As work progresses, build in metal door frames, window frames, anchor bolts, plates and other items furnished by other Sections.

B. Build in items plumb and level.

C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.

D. Do not build in organic materials subject to deterioration.

3.11 TOLERANCES

A. Erect masonry within the tolerances of TMS 602 Article 3.3 F.

3.12 CUTTING AND FITTING

A. Openings in CMU walls shall conform with details on structural drawings.

B. Obtain Architect/Engineer approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.13 POINTING AND CLEANING

A. Final Cleaning: Comply with provisions of Section 01 77 00, Closeout Procedures, and the following.
   1. Use non-metallic tools in cleaning operations.
   2. Remove excess mortar and mortar smears.
   3. Clean soiled surfaces with cleaning solution.
   4. Do not use acid solution to remove green stain or efflorescence resulting from vanadium salts. Follow recommendations of manufacturer for removal of such stains.
   5. When ordinary methods are not adequate, with Architect's approval, employ sandblasting, chipping or other special methods.

B. Point holes or defective mortar joints upon completion of work; where necessary, cut out and re-point defective joints.
   1. Replace defective or damaged work with conforming work.
   2. Match adjacent work.

C. Architect will review proposals for the repair or replacement of damaged, defective, or missing work.

D. Progress Cleaning:
   1. At end of workday, fiber brush new surfaces to remove mortar splotches, clean with mild detergent or enzymes, and rinse with clean water.

E. Protect finished installation under provisions of Section 01 50 00, Temporary Facilities and Controls.

F. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

3.14 FIELD QUALITY CONTROL

A. General:
   1. Refer to approved Testing and Inspection criteria in contract documents.
   2. Owner will select a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services will be made by Owner.
   3. Refer to Section 01 45 23, Testing & Inspection Services, for additional requirements.

B. Masonry Inspection:
   1. Masonry construction shall be inspected and verified in accordance with TMS 402/602 Level 3 quality assurance program as set forth in Tables 3 and 4.
   2. Structural masonry work shall be periodically inspected during laying and continuously during grouting by a special inspector specially.
      a. The inspector shall make test samples and perform such tests as are required and shall check the materials, details of construction, and construction procedures.

b. The special masonry inspector shall furnish a verified report that, of its own personal knowledge, the work covered by the report has been performed, and materials used and installed in every material respect in compliance with the duly approved Drawings and Specifications.

C. Inspection and testing of post-installed anchors in masonry shall be required in accordance with requirements for concrete in CBC Chapters 17 and 19.

D. Testing for compressive strength on installed masonry shall be in accordance with CBC 2105.
   1. Mortar and Grout Tests: Comply with CBC Section 2105.3.
   2. Masonry Core Testing: In accordance with CBC 2105.4.

3.15 PAINTING AND COATING

A. Prepare Concrete masonry units indicated to be painted per Section 09 91 00, Painting.

B. Prepare concrete masonry units to receive water repellent in accordance with Section 07 19 00, Water Repellents, and graffiti-resistant coating per Section 09 96 23, Graffiti-Resistant Coatings, where indicated.
   1. Masonry units must be clean, dry, and free of efflorescence, dust and mortar.
   2. Mortar joints must be free of defects as defined by the coating manufacturer.

END OF SECTION

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions of Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

B. Related Sections: The following sections are noted as containing requirements that relate to this Section, but may not be limited to this listing.
   1. Division 08: Section - Hollow Metal Doors and Frames.
   2. Division 08: Section - Flush Wood Doors.
   3. Division 08: Section - Aluminum-Framed Storefronts.

1.03 REFERENCES

A. 2022 California Building Code, CCR Title 24, Part 2

B. BHMA - Builders' Hardware Manufacturers Association

C. DHI - Door and Hardware Institute

D. NFPA - National Fire Protection Association.
   1. NFPA 80 - Fire Doors and Other Opening Protectives
   2. NFPA 105 - Smoke and Draft Control Door Assemblies

E. UL - Underwriters Laboratories.
   1. UL 10C - Fire Tests of Door Assemblies
   2. UL 305 - Panic Hardware

F. WHI - Warnock Hersey Incorporated

G. SDI - Steel Door Institute

1.04 SUBMITTALS & SUBSTITUTIONS

A. General: Submit in accordance with Conditions of the Contract and Division 01 Specification sections.

B. Submit product data (catalog cuts) including manufacturers' technical product information for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

C. Submit electronic PDF copies of schedule organized vertically into “Hardware Sets” with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:
1. Include a Cover Sheet with:
   a. Job Name, location, telephone number.
   b. Architects name, location and telephone number.
   c. Contractors name, location, telephone number and job number.
   d. Suppliers name, location, telephone number and job number.
   e. Hardware consultant's name, location and telephone number.
2. Job Index information included:
   a. Numerical door number index including; door number, hardware heading number and page number.
   b. Complete keying information (referred to DHI hand-book "Keying Systems and Nomenclature"). Provision should be made in the schedule to provide keying information when available; if it is not available at the time the preliminary schedule is submitted.
   c. Manufacturers' names and abbreviations for all materials.
   d. Explanation of abbreviations, symbols, and codes used in the schedule.
   e. Mounting locations for hardware.
   f. Clarification statements or questions.
   g. Catalog cuts and manufacturer’s technical data and instructions.
3. Vertical schedule format sample:

Heading Number 1 (Hardware group or set number - HW Group #1)				
(a) 1 Single - Door #101 - Corridor 101 to Exterior			(b) 90°	(c) RH
(d) 3'-0" x 7'-0" x 1-3/4" - Wood Door x Hollow Metal Frame - 20 Minute				
(e) 1.	(f) 3 ea	(g) Hinges - (h) 5BB1 4.5 x 4.5 NRP (i) 1/2 TMS	(j) 630	(k) IVE
2.	1 ea	Lockset - ND80P6D x RHO x RH x 10-025 x JTMS	626	SCH
3.	1 ea	Closer - 4040XP x EDA x TBSRT	689	LCN

   a) Single or pair of doors with opening number and location.
   b) Degree of opening.
   c) Hand of door(s).
   d) Door/frame dimensions and material; Label requirements, if any.
   e) Hardware item line # (Optional).
   f) Quantity.

g) Product description.
h) Product part number.
i) Fastenings and other pertinent information.
j) Hardware finish codes per ANSI/BHMA A156.18.
k) Manufacturer abbreviation.

D. Make substitution requests in accordance with Division 01. Substitution requests must be made prior to bid date. Include product data and indicate benefit to the project. Furnish samples of any proposed substitution.

E. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

F. Wiring Diagrams: Provide product data and wiring and riser diagrams for all electrical products listed in the Hardware Schedule portion of this section.

G. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

H. Furnish as-built/as-installed schedule with close-out documents, including keying schedule and transcript, wiring/riser diagrams, manufacturers' installation and adjustment and maintenance information.

1.05 QUALITY ASSURANCE

A. Obtain each type of hardware (latch and lock sets, hinges, closers, exit devices, etc.) from a single manufacturer.

B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.
1. Responsible for detailing, scheduling and ordering of finish hardware.
2. Meet with Owner to finalize keying requirements and to obtain final instructions in writing. To maintain the integrity of patented key systems provide a letter of authorization from the specified manufacturer indicating that supplier has authorization to purchase the key system directly from the manufacturer.
3. Stock parts for products supplied and are capable of repairing and replacing hardware items found defective within warranty periods.

C. Hardware Installer: Company specializing in the installation of commercial door hardware with five years documented experience.

D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not.
   1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".

E. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

F. Product packaging to be labelled in compliance with CA Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986.

1.06 DELIVERY, STORAGE AND HANDLING

A. Coordinate delivery of packaged hardware items to the appropriate locations (shop or field) for installation.

B. Hardware items shall be individually packaged in manufacturers’ original containers, complete with proper fasteners. Clearly mark packages on outside to indicate contents and locations in hardware schedule and in work.

C. Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.

D. Contractor to inventory door hardware jointly with representatives of hardware supplier and hardware installer until each all are satisfied that count is correct.

1.07 WARRANTY

A. Provide warranties of respective manufacturers’ regular terms of sale from day of final acceptance as follows:
   1. Locksets: Ten (10) years.
   2. Exit devices: Three (3) years.
   3. Closers: Thirty (30) years.
   4. All other hardware: Two (2) years.

1.08 MAINTENANCE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.09 PRE-INSTALLATION CONFERENCE

A. Convene a pre-installation conference at least one week prior to beginning work of this section.

B. Attendance: Architect, Construction Manager, Contractor, Security Contractor, Hardware Supplier, Installer, Key Owner's Personnel, and Project Inspector.

C. Agenda: Review hardware schedule, products, installation procedures and coordination required with related work. Review Owner's keying standards.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Item	Manufacturer	Acceptable Substitutes
Hinges	Ives	Hager, Stanley, McKinney
Locks, Latches & Cylinders	Schlage	None – District Standard
Exit Devices	Von Duprin	None – District Standard

2.02 MATERIALS

A. Heavy Duty Cylindrical Locks and Latches: Schlage "ND" Series as scheduled with "Rhodes" lever design.
   1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3 hour fire doors.
   2. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:
      a. Abusive locked lever torque – minimum 3,100 inch-pounds without gaining access.
      b. Offset lever pull – minimum 1,600 foot pounds without gaining access.
      c. Vertical lever impact – minimum 100 impacts without gaining access.
      d. Cycle Test – tested to minimum 16 million cycles with no visible lever sag; without the use of performance aids such as set screws or spacers.
   3. Cylinders: Refer to "KEYING" article, herein.
   4. Provide locks with standard 2-3/4" backset, unless noted otherwise, with 1/2" latch throw. Provide proper latch throw for UL listing at pairs.
   5. Provide locksets with separate solid steel anti-rotation thru-bolts, and no exposed screws.
   6. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
   7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.

8. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
9. Provide levers with vandal resistant technology as scheduled for use at abusive applications.

B. Exit devices: Von Duprin as scheduled.
1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Provide certificate by independent testing laboratory that device has completed over 1,000,000 cycles and can still meet ANSI/BHMA A156.3 standards.
3. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Provide exit devices cut to door width and height. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
6. Provide flush end caps for exit devices.
7. Exit devices shall comply with CBC Section 11B-404.2.7 and shall be mounted between 34" and 44" above the finished floor surface.
8. Provide exit devices UL certified to meet 5 lbs. maximum unlatching force requirements according to the CBC Section 11B-309.4.
9. Cylinders: Refer to “KEYING” article, herein.
10. Provide cylinder dogging as specified at non fire-rated openings. Provide cylinder dogging indicators (CDSI) for visible indication of dogging status as specified.
11. Removable Mullions: Provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
12. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
13. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
14. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.
15. Provide exit devices with manufacturer’s approved strikes.
16. Panic hardware shall not be provided with “Night Latch” (NL) function for any accessible doors or gates unless the following conditions are met per DSA Interpretation 10-08 DSA/AC. Such conditions must be clearly demonstrated and indicated in the specification:
    a. Panic hardware contains a “dogging” feature and during the time the facility is open the panic hardware shall be “dogged”.
    b. The act of “dogging” a door in the open position shall only be performed by employees as a part of their job function (non-public use).

2.03 KEYING

A. Furnish a Proprietary Schlage masterkey system as directed by the owner or architect. Key system to be designated and combinated by the Schlage Master Key Department even if pinned by the Authorized Key Center, Authorized Security Center or a local authorized commercial dealer.

B. A detailed keying schedule is to be prepared by the owner and/or architect in consultation with a representative of Allegion or an Authorized Key Center or Authorized Security Center. Each keyed cylinder on every keyed lock is to be listed separately showing the door #, key group (in BHMA terminology), cylinder type, finish and location on the door.

C. Extend the original Schlage masterkey system established for the project.

D. Furnish all cylinders in the Schlage Full Size Interchangeable Core (FSIC). Pack change keys independently (PKI)

E. Furnish construction keying for doors requiring locking during construction.
   1. For FSIC systems provide 23-030-ICX Full Size Construction Cores
   2. For FSIC systems provide ten 48-101-ICX Construction Keys
   3. For FSIC systems provide two 48-056-ICX Control Keys (const.)
   4. For FSIC systems provide two control keys for installing the permanent cores (49-056 for “Classic” keyways, 48-052-XP for “Classic Primus”) (49-003 for “Everest Conventional”, 48-005–XP for “Everest Primus”)

F. Furnish all keys with visual key control. (Not all options listed below are available at the same time.)
   1. Stamp key “Do Not Duplicate”.
   2. Stamp (BHMA) key symbol on key.

G. Furnish all cylinders with visual key control. (Not all options listed below are available at the same time.)
   1. Stamp (BHMA) key symbol on side of cylinder (CKC).

H. Furnish mechanical keys as follows:
   1. Furnish 2 cut change keys for each different change key code.
   2. Furnish 1 uncut key blank for each change key code.
   3. Furnish 6 cut masterkeys for each different masterkey set.
   4. Furnish 3 uncut key blanks for each masterkey set.
   5. Furnish 2 cut control keys cut to the top masterkey for permanent I/C cylinders.
   6. Furnish 1 cut control key cut to each SKD combination.
   7. Furnish KS43D2200 padlock for use with non-I/C Schlage cylinders. Furnish 47-413 (conventional) or 47-743-XP (PrimusXP) with above.
   8. Furnish KS43G3200 padlock for use with FSIC Schlage cylinders. Furnish 23-030 (Classic / Everest) or 20-740 (PrimusXP) with above.

9. Furnish KS41D1200 padlock for use with SFIC Schlage cylinders. Furnish 80-037 (Everest-B) with above.

2.04 FINISHES

A. Generally to be satin chrome US26D (626 on bronze and 652 on steel) unless otherwise noted.

B. Furnish push plates, pull plates and kick or armor plates in satin stainless steel US32D (630) unless otherwise noted.

C. Door closers shall be powder-coated to match other hardware, unless otherwise noted.

D. Aluminum items to be finished anodized aluminum except thresholds which can be furnished as standard mill finish.

2.05 FASTENERS

A. Screws for strikes, face plates and similar items shall be flat head, countersunk type, provide machine screws for metal and standard wood screws for wood.

B. Screws for butt hinges shall be flathead, countersunk, full-thread type.

C. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.

D. Provide expansion anchors for attaching hardware items to concrete or masonry.

E. All exposed fasteners shall have a phillips head.

F. Finish of exposed screws to match surface finish of hardware or other adjacent work.

G. All Exit Devices and Lock Protectors shall be fastened to the door by the means of sex bolts or through bolts.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that doors and frames are square and plumb and ready to receive work and dimensions are as instructed by the manufacturer.

B. Beginning of installation means acceptance of existing conditions.

C. Fire-Rated Door Assembly Inspection: Upon completion of the installation, all fire door assemblies shall be inspected to confirm proper operation of the closing device and

latching device and that only the manufacturer's furnished fasteners are used for installation and that it meets all criteria of a fire door assembly per NFPA 80 (Standard for Fire Doors and Other Opening Protectives) 2016 Edition. A written record shall be maintained and transmitted to the Owner to be made available to the Authority Having Jurisdiction (AHJ). The inspection of the swinging fire doors shall be performed by a certified FDAI (Fire Door Assembly Inspector) with knowledge and understanding of the operating components of the type of door being subjected to the inspection. The record shall list each fire door assembly throughout the project and include each door number, an itemized list of hardware set components at each door opening, and each door location in the facility.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.

B. Use the templates provided by hardware item manufacturer.

C. Mounting heights for hardware shall be as recommended by DHI. Operating hardware shall be located between 34" and 44" above finish floor to comply with CBC Section 11B-404.2.7.

D. Door Closers:
1. Place door closers inside building, stairs, rooms, etc. Closers shall be installed to permit doors to swing 180 degrees or maximum allowable by conditions.
2. Maximum effort to operate closers shall not exceed 5 lbs., such pull or push effort being applied at right angles to hinged doors.
3. When fire doors are required, the maximum effort to operate the closer may be increased but shall not exceed 15 lbs. when specifically approved by fire marshal.
4. All closers shall be adjusted to operate with the minimum amount of opening force and still close and latch the door. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.
5. Compensating devices or automatic door operators may be utilized to meet the above standards.
6. Per CBC Section 11B-404.2.8.1, doors shall take minimum of 5 seconds to move from an open position of 90 degrees to 12 degrees to the latch jamb.

E. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

G. Set thresholds for exterior doors in full bed of butyl-rubber sealant.

H. If hand of door is changed during construction, make necessary changes in hardware at no additional cost.

I. Hardware Installer shall coordinate with security contractor to route cable to connect electrified locks, panic hardware and fire exit hardware to power transfers or electric hinges at the time these items are installed so as to avoid disassembly and reinstallation of hardware.

J. Hardware Installer shall also be present with the security contractor when the power is turned on for the testing of the electronic hardware applications. Installer shall make adjustments to solenoids, latches, vertical rods and closers to ensure proper and secure operation.

K. All wiring for electro-mechanical hardware mounted on the door shall be connected through the power transfer and terminated in the interface junction box specified for in the Electrical Section.

L. Conductors shall be minimum 18 gage stranded, multicolored. A minimum 12 in. loop of conductors shall be coiled in the interface junction box. Each conductor shall be permanently marked with its function.

M. If a power supply is specified in the hardware sets, all conductors shall be terminated in the power supply. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacturer’s technical documentation.

3.03 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surface soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy, return to that work area and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.

E. Continued Maintenance Service: Approximately six months after the completion of the project, the Contractor accompanied by the Architectural Hardware Consultant, shall return to the project and re-adjust every item of hardware to restore proper functions of

doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.04 HARDWARE LOCATIONS

A. Conform to CCR, Title 24, Part 2; and ADAAG; and the drawings for access-compliant positioning requirements for the disabled.

3.05 FIELD QUALITY CONTROL

A. Contractor is responsible for providing the services of an Architectural Hardware Consultant (AHC) or a proprietary product technician to inspect installation and certify that hardware and its installation have been furnished and installed in accordance with manufacturers' instructions and as specified herein.

3.06 HARDWARE SCHEDULE

A. The items listed in the following schedule shall conform to the requirements of the foregoing specifications.

B. While the hardware schedule is intended to cover all doors, and other movable parts of the building, and establish type and standard of quality, the contractor is responsible for examining the Plans and Specifications and furnishing proper hardware for all openings whether listed or not. If there are any omissions in hardware groups in regard to regular doors they shall be called to the attention of the Architect prior to bid opening for instruction; otherwise, list will be considered Complete. No extras will be allowed for omissions.

C. The Door Schedule on the Drawings indicates which hardware set is used with each door.

Abbreviation	Name
BRK	Brookfield Industries Inc
CRO	Crown Industrial
LCN	LCN Commercial Division
LOX	Locinox
RIC	Richards-Wilcox, Inc.
SCE	Schlage Electronic Security
SCH	Schlage Lock Company
VON	Von Duprin

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GROUP NO. 01

3	EA	HINGE	I-8505	600	BRK
1	EA	PANIC HARDWARE	OUT-PA-AX-98-L-NL-06-WH	630	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE 12/24 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4111 AVB SCUSH SRI	689	LCN
1	EA	MULTITECH READER	MT SERIES READER	BLK	SCE
1	EA	POWER SUPPLY	PS902 120/240 VAC	LGR	SCE

GROUP NO. 02

3	EA	HINGE	BY GATE FABRICATOR		
1	EA	PANIC HARDWARE	OUT-PA-AX-98-L-NL-06-WH	630	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	ELECTRIC STRIKE	6111 FSE 12/24 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4111 AVB SCUSH SRI	689	LCN
1	EA	MULTITECH READER	MT SERIES READER	BLK	SCE
1	EA	POWER SUPPLY	PS902 120/240 VAC	LGR	SCE

GROUP NO. 03

1	SET	SELF CLOSING HINGE	TIGER		LOX
1	EA	PANIC HARDWARE	OUT-PA-AX-98-L-KC-06-WH	630	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	26-091 XQ11-948 ICX	626	SCH
2	EA	PRIMUS CORE	20-740	626	SCH

GROUP NO. 04

3	EA	HINGE	I-8505	600	BRK
1	EA	PANIC HARDWARE	OUT-PA-AX-98-L-KC-06-WH	630	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	26-091 XQ11-948 ICX	626	SCH
2	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	4111 AVB SCUSH SRI	689	LCN

GROUP NO. 05

3	EA	HINGE	I-8505	600	BRK
1	EA	VANDL CLASSROOM LOCK	ND94TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH

GROUP NO. 06

2	EA	HINGE	BY GATE FABRICATOR		
1	EA	VANDL CLASSROOM LOCK	ND94TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH

GROUP NO. 07

2	EA	HINGE	I-8505	600	BRK
1	EA	DBL CYL STORE LOCK	ND66TD RHO	626	SCH
2	EA	PRIMUS CORE	20-740	626	SCH

GROUP NO. 08

4	EA	HINGE	I-8505	600	BRK
2	EA	POWER TRANSFER HINGE	I-8505-ETW-2 8-WIRE	600	BRK
2	EA	ELEC PANIC HARDWARE	OUT-QELX-PA-AX-98-L-NL-06-WH	630	VON
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	PRIMUS CORE	20-740	626	SCH
2	EA	SURFACE CLOSER	4111 AVB SCUSH SRI	689	LCN
1	EA	MULTITECH READER	MT SERIES READER	BLK	SCE
1	EA	POWER SUPPLY	PS904 120/240 VAC	LGR	SCE

GROUP NO. 09

4	EA	HINGE	BY GATE FABRICATOR		
2	EA	CANE BOLT	0524.00021	Z	RIC
1	EA	PADLOCK L/CYL-FSIC	KS43F3200	606	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	HASP	7" FLAT		CRO

GROUP NO. 10

4	EA	HINGE	I-8505	600	BRK
2	EA	CANE BOLT	0524.00021	Z	RIC
1	EA	PADLOCK L/CYL-FSIC	KS43F3200	606	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	HASP	7" FLAT		CRO

END OF SECTION

SECTION 10 14 00 - SIGNAGE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Post-and-panel signs.
   2. Marquee signs.

B. Related Sections:
   1. Division 01 sustainable design requirements Section(s) for supplementary sustainable design criteria.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For signs.
   1. Include fabrication and installation details and attachments to other work.
   2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
   3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign.

C. Samples: For each exposed product and for each color and texture specified.

D. Product Schedule: For signs. Use same designations indicated on Drawings or specified.

1.03 INFORMATIONAL SUBMITTALS

A. Sustainable Design Submittals:
   1. Documentation for adhesives, indicating VOC content.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

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PART 2 - PRODUCTS

2.01 SUSTAINABLE DESIGN CRITERIA

A. Sustainable Design Criteria: Comply with indicated criteria for the following product categories:
   1. Adhesives:
      a. VOC content limits for field applications.

2.02 PERFORMANCE REQUIREMENTS

A. Structural Performance: Signs and supporting elements shall withstand the effects of gravity and other loads within limits and under conditions indicated.

B. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.
   1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

C. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and California Building Code, Chapter 11.

2.03 POST-AND-PANEL SIGNS

A. Exterior **Parking** Sign: Sign of single-panel configuration; with smooth, uniform surfaces and support assembly; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
   1. Sign Material: Galvanized steel:
      a. Surface-Applied Finish and Graphics: Engineer-grade reflective finish.
         1) Color: As indicated on Drawings.
   2. Posts: Steel.
      a. Shape: As indicated on Drawings.
      b. Size: **As indicated on Drawings**.
      c. Installation Method: **As indicated on Drawings**.

B. Post-and-Panel Sign: Sign of single-panel configuration; with smooth, uniform surfaces and support assembly; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
   1. Sign Material: Galvanized sheet:
      a. Surface-Applied Graphics: Applied vinyl film.
   2. Posts: Steel.
      a. Shape: Square.
      b. Size: 2 by 2 inches.
      c. Installation Method: Direct burial.
      d. Finish and Color: Mill.

C. Accessories:

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1. Mounting Brackets: Extruded aluminum or galvanized steel clamp-on brackets fabricated for use with round posts, two brackets per sign, with tamper-resistant nuts and bolts.

2.04 MARQUEE SIGNS

A. Marquee Sign: Digital LED display, including control software, for programmable messages including text, graphics, logos, basic animation, video clips, and as follows:
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Golden Rule Signs; Impact G4 Series, or comparable product by approved manufacturer.
   2. Configuration: Double-faced.
   3. LED:
      a. Pitch: 9mm.
      b. Color: RGB.
      c. Matrix: 128 x 224.
   4. Size: As indicated on Drawings.
   5. Ventilation: Side.
   6. Mounting: Pedestal as indicated on Drawings.

2.05 SIGN MATERIALS

A. Aluminum Castings: ASTM B26/B26M, alloy and temper recommended by sign manufacturer for casting process used and for type of use and finish indicated.

B. Aluminum Sheet and Plate: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

C. Aluminum Extrusions: ASTM B221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

D. Vinyl Film: UV-resistant vinyl film of nominal thickness indicated, with pressure-sensitive, permanent adhesive on back; die cut to form characters or images as indicated on Drawings and suitable for exterior applications.

2.06 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following unless otherwise indicated:
   1. Use concealed fasteners and anchors unless indicated to be exposed.
   2. For exterior exposure, furnish stainless-steel or hot-dip galvanized devices unless otherwise indicated.
   3. Exposed Metal-Fastener Components, General:
      a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.

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B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

C. Anchoring Materials:
1. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.07 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
1. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
2. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
3. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
4. Internally brace signs for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners.
5. Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.
6. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

B. Shop- and Subsurface-Applied Vinyl: Align vinyl film in final position and apply to surface. Firmly press film from the middle outward to obtain good bond without blisters or fishmouths.

C. Post Fabrication: Fabricate posts designed for structural performance indicated and of lengths required for installation method indicated for each sign.
1. Steel Posts: Fabricate from minimum **0.120-inch-** thick, steel tubing unless otherwise indicated.
a. Hot-dip galvanize post assemblies after fabrication according to ASTM A123/A123M.
2. Direct Burial: Fabricate posts 36 inches longer than height of sign to permit direct burial or embedment in concrete foundations or concrete-filled postholes.

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PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
   1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
   2. Install signs so they do not protrude or obstruct according to the accessibility standard.
   3. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

B. Remove temporary protective coverings and strippable films as signs are installed.

3.02 INSTALLING POSTS

A. Direct-Burial Method:
   1. Excavation: Excavate posthole to dimensions indicated. Reconstruct subgrade that is not firm, undisturbed, or compacted soil, or that is damaged by freezing temperatures, frost, rain, accumulated water, or construction activities by excavating an additional 12 inches, backfilling with satisfactory soil or well-graded aggregate, and compacting to original subgrade elevation.
   2. Setting in Earth: Set post in position, support to prevent movement, and backfill with satisfactory soil or well-graded aggregate as recommended in writing by manufacturer. Place and compact backfill in 6-inch lifts, compacting each lift.
   3. Setting in Cast-in-Place Concrete: Set post in position, support to prevent movement, and place concrete in posthole as indicated on Drawings.
   4. Setting in Preformed Hole in Concrete Foundation: Form or core drill holes in concrete foundation not less than 3/4 inch larger than outside dimension of post for installing posts in concrete. Set post in position, shim to prevent movement, and fill annular space between post and hole with **nonshrink, nonmetallic grout**, mixed and placed to comply with manufacturer's written instructions.
      a. Leave anchorage joint exposed with 1/8-inch anchoring material sloped away from post.

B. Baseplate Method:
   1. Preset Anchor Bolts: Set post baseplate in position over anchor bolts projecting from concrete foundation, shim and support post to prevent movement, place washers and nuts, and tighten. Fill shim space with nonshrink, nonmetallic grout, mixed and placed to comply with manufacturer's written instructions.
   2. Drilled-in-Place Anchor Bolts: Set post baseplate in position over concrete foundation, locate and drill anchor holes, shim and support post to prevent movement, place washers and anchor bolts, and tighten. Fill shim space with

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nonshrink, nonmetallic grout, mixed and placed to comply with manufacturer's written instructions.

END OF SECTION

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SECTION 10 14 63 - ELECTRONIC MESSAGE SIGNAGE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Exterior electronic LED message signage.
   2. Control software.

B. Related Sections:
   1. Division 01 sustainable design requirements Section(s) for supplementary sustainable design criteria.
   2. Division 26 for illuminated, self-luminous, and photoluminescent exit sign units.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For electronic message signage.
   1. Indicate dimensions, description of materials and finishes, general construction, Project-specific modifications, component connections, anchorage methods, hardware, and installation procedures in addition to the following specific requirements:
      a. Location of electrical connections to junction boxes. Indicate power requirements of each component.
      b. Indicate weight of each component, locations of mounting reinforcement, and recommended connections.
      c. Wiring diagrams for each component specified.

1.03 INFORMATIONAL SUBMITTALS

A. Design Data Submittal: For structural foundations to accommodate seismic movement of Electronic Message Signage complying with performance requirements and design criteria indicated on Structural Drawings. Include analysis date signed and sealed by qualified professional engineer responsible for their preparation licensed in state in which Project is located.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance Data: For electronic message signage to include in maintenance manuals.

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1.05 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of electronic message signage that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE CRITERIA

A. Structural Performance: Exterior signage assemblies, including anchorages and supports, shall withstand the effects of gravity loads, and the following loads and stresses within limits and under conditions indicated according to the following design criteria:

   1. Seismic Loads: As indicated on Drawings according to ASCE 7.
   2. Wind Loads: As indicated on Drawings.

B. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.
   1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.02 ELECTRONIC MESSAGE SIGNAGE

A. Electronic Message Sign: Digital LED display, including control software, for programmable messages including text, graphics, logos, basic animation, video clips, and as follows:
   1. Basis of Design: Golden Rule Signs, 9mm LED Message Unit, Impact G4 Series.
   2. LED Message Unit:
      a. Pitch: 9mm.
      b. Color: RGB – 2 billion colors.
      c. Matrix: 128 x 224.
      d. Dimensions: 48 inches H, 84 inches W.
      e. Lines: 21 maximum.
      f. Characters Per Line: 44.
      g. Configuration: Double Face, extruded aluminum side covers included.
      h. Ventilation: Side.
   3. Identification/Logo Cabinet: Extruded aluminum cabinet above LED Message Unit to include school name/logo sign.
      a. Size: 24 inches H, 84 inches wide.

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b. Finish and Color: As selected by Architect from manufacturer's full range.

4. Pedestal: Extruded aluminum pedestal housing the structural support for LED Message Unit and Logo Cabinet.
   a. Size: 23 inches H, 24 inches W.
   b. Structure: 4 inch steel structural support.

2.03 CONTROL SOFTWARE

A. Control Software: Cloud-based display content and scheduling control software access through web browser GUI.
   1. Supported Media Formats:
      a. Images: PNG, BMP, GIF, JPG, and PSD.
      b. Video: AVI, MPG, MP4, and MOV.

2.04 FABRICATION

A. General: Provide manufacturer's standard electronic message signage assemblies according to requirements indicated.
   1. Preassemble signage in shop to greatest extent possible. Disassemble signage only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in locations concealed from view after final assembly.
   2. Mill joints to tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
   3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed joints of flux, and dress exposed and contact surfaces.
   4. Conceal fasteners and anchors unless indicated to be exposed; locate exposed fasteners where they will be inconspicuous.
   5. Internally brace signage for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners.

B. Electronic Signage Message Panels: Construct panel surfaces to be smooth and to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner.
   1. Coordinate dimensions and attachment methods to produce message panels with closely fitting joints. Align edges and surfaces with one another in the relationship indicated.
   2. Increase panel thickness or reinforce with concealed stiffeners or backing materials as needed to produce surfaces without distortion, buckles, warp, or other surface deformations.
   3. Continuously weld joints and seams unless other methods are indicated; grind, fill, and dress welds to produce smooth, flush, exposed surfaces with welds invisible after final finishing.

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2.05 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of Work.

B. Verify that signage support surfaces are within tolerances to accommodate signage.

C. Verify that anchorage devices embedded in permanent construction are correctly sized and located to accommodate signage.

D. Verify that electrical service is correctly sized and located to accommodate signage.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General: Install electronic message signage using installation methods indicated and according to manufacturer's written instructions.
   1. Install signage level, plumb, and at locations and heights indicated, with signage surfaces free of distortion and other defects in appearance.
   2. Before installation, verify that signage components are clean and free of materials or debris that would impair installation.

B. Pedestal Installation:

   1. Preset Anchor Bolts: Set post baseplate in position over anchor bolts projecting from concrete foundation, shim and support post to prevent movement, place washers and nuts, and tighten. Fill shim space with non-shrink, nonmetallic grout, mixed and placed to comply with manufacturer's written instructions.
   2. Drilled-in-Place Anchor Bolts: Set post baseplate in position over concrete foundation, locate and drill anchor holes, shim and support post to prevent movement, place washers and anchor bolts, and tighten. Fill shim space with nonshrink, nonmetallic grout, mixed and placed to comply with manufacturer's written instructions.

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3.03 TOLERANCES

A. Plumb, Level, and True. Maximum of 1/8 inch variation between top and bottom of signage cabinet.

3.04 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed electronic message signage that does not comply with specified requirements. Replace signage with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

D. Leave premises clean, free from residue due to work of this Section.

3.05 DEMONSTRATING AND TRAINING

A. Provide demonstration and training session for Owner's representative covering operation and maintenance of electronic message signage.

END OF SECTION

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SECTION 10 75 00 - FLAGPOLES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Ground-mounted flagpoles made from aluminum.

1.02 PERFORMANCE REQUIREMENTS

A. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand the effects of gravity loads, and the following loads and stresses within limits and under conditions indicated according to the following design criteria:

   1. Seismic Loads: <**Insert seismic criteria**> according to [**SEI/ASCE 7**] <**Insert requirement**>.
   2. Wind Loads: <**Insert wind speed and exposure factor**> according to [**NAAMM FP 1001, "Guide Specifications for Design of Metal Flagpoles."**] [**SEI/ASCE 7**] <**Insert requirement**>.
   3. Base flagpole design on polyester flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.04 INFORMATIONAL SUBMITTALS

A. Delegated-Design Submittal: For flagpole assemblies indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

   1. Include loads, point reactions, and locations for attachment of flagpoles to building's structure.

B. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain flagpole as complete unit, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

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1.06 DELIVERY, STORAGE, AND HANDLING

A. General: Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. American Flagpole & Flag Co.
2. Atlantic Fiberglass Products, Inc.
3. Baartol Company.
4. Concord American Flagpole.
5. Eder Flag Manufacturing Company, Inc.
6. Ewing Flagpoles.
7. Lingo Inc.; Acme Flagpole Company Division.
8. Millerbernd Manufacturing Company.
9. Morgan-Francis; Division of Original Tractor Cab Co., Inc.
10. PLP Composite Technologies, Inc.
11. Pole-Tech Company Inc.
12. U.S. Flag & Flagpole Supply, LP.

B.

2.02 FLAGPOLES

A. Basis-of-Design Product: American Flagpole & Flag Co. Independence Model Flagpole.

B. Flagpole Construction, General: Construct flagpoles in one piece if possible. If more than one piece is necessary, comply with the following:

1. Fabricate shop and field joints without using fasteners, screw collars, or lead calking.
2. Provide flush hairline joints using self-aligning, snug-fitting, internal sleeves.
3. Provide self-aligning, snug-fitting joints.

C. Exposed Height: 30 feet.

D. Aluminum Flagpoles: Provide cone -tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063, with a minimum wall thickness of 3/16 inch.

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E. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, not less than 0.064-inch- nominal wall thickness. Provide with 3/16-inch steel bottom plate and support plate; 3/4-inch- diameter, steel ground spike; and steel centering wedges welded together. Galvanize steel after assembly. Provide loose hardwood wedges at top of foundation tube for plumbing pole.

1. Provide flashing collar of same material and finish as flagpole.
2. Provide steel ground protectors extending 12 inches aboveground and 6 inches belowground for steel flagpoles where flashing collars are not provided.

2.03 FITTINGS

A. Finial Ball: Manufacturer's standard flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.

1. 0.063-inch spun aluminum with gold anodic finish.

B. Internal Halyard, Winch System: Manually operated winch with control stop device and removable handle, stainless-steel cable halyard, and concealed revolving truck assembly with plastic-coated counterweight and sling. Provide flush access door secured with cylinder lock. Finish truck assembly to match flagpole.

1. Halyard Flag Snaps: Provide two stainless-steel swivel snap hooks per halyard.

C. Flagpole Light: L.E.D. lighting fixture attached to flagpole to illuminate flag.
1. Basis-of-Design Product: PoleLed O2 with Halyard System Kit.
   a. Wattage: 90 Watt.
   b. Light output: 9500 lumens.
   c. Material: Aluminum.
   d. Color: As selected by Architect from manufacturer’s full range.

2.04 MISCELLANEOUS MATERIALS

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

B. Drainage Material: Crushed stone, or crushed or uncrushed gravel; coarse aggregate.

C. Sand: ASTM C 33, fine aggregate.

D. Elastomeric Joint Sealant: Multicomponent nonsag urethane or Single-component nonsag urethane.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

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2.05 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.06 ALUMINUM FINISHES

A. Natural Satin Finish: AA-M32, fine, directional, medium satin polish; buff complying with AA-M20; seal aluminum surfaces with clear, hard-coat wax.

B. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, including foundation; accurate placement, pattern, orientation of anchor bolts, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Prepare uncoated metal flagpoles that are set in foundation tubes by painting below-grade portions with a heavy coat of bituminous paint.

B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.

C. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms to prevent displacement during concreting.

D. Place concrete, as specified in Division 03 Section " Miscellaneous Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for not less than seven days or use nonstaining curing compound.

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E. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.03 FLAGPOLE INSTALLATION

A. General: Install flagpoles where shown and according to Shop Drawings and manufacturer's written instructions.

B. Ground Set: Place sleeve, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level sleeve and allow concrete to cure. Install flagpole, plumb, in sleeve.

1. Foundation Tube: Place tube seated on bottom plate between steel centering wedges and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch layer of elastomeric joint sealant and cover with flashing collar.

C. Baseplate: Cast anchor bolts in concrete foundation. Install baseplate on washers placed over leveling nuts on anchor bolts and adjust until flagpole is plumb. After flagpole is plumb, tighten retaining nuts and fill space under baseplate solidly with nonshrink, nonmetallic grout. Finish exposed grout surfaces smooth and slope 45 degrees away from edges of baseplate.

D. Mounting Brackets and Bases: Anchor brackets and bases securely through to structural support with fasteners as indicated on Shop Drawings.

E. Lighting System: Install flagpole lighting system using installation methods indicated and according to manufacturer's written instructions.

END OF SECTION

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SECTION 10 82 00 - GRILLES AND SCREENS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Fixed screen assemblies.

1.02 COORDINATION

A. Coordinate installation of anchorages for fixed panel assemblies. Furnish setting drawings, templates, and directions for installing anchorages.

B. Coordinate installation of fixed panel assemblies with adjacent construction to ensure that wall assemblies, flashings, trim, and joint sealants, are protected against damage from the effects of weather, age, corrosion, and other causes of deterioration.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include fabrication and installation layouts of [grille] [and] [screen] panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details.

C. Samples for Verification: For each type of exposed finish required, prepared on 6-inch-square Samples of metal of same thickness and material indicated for the Work.

1.04 INFORMATIONAL SUBMITTALS

A. Desing Data Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing screen assemblies similar to that indicated for this Project and with a record of successful in-service performance as well as sufficient production capacity to produce required units.

B. Welding Qualifications: Qualify procedures and personnel according to the following:

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1. AWS D1.3, "Structural Welding Code - Sheet Steel."

1.06 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with panel assemblies by field measurements before fabrication and indicate measurements on Shop Drawings.

1.07 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of screen assemblies that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 SOURCE LIMITATIONS

A. For screen panels, obtain each color, grade, finish, type, and variety of metal from single source with resources to provide products of consistent quality in appearance and physical properties.

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2.02 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design grilles and screens and support system, including comprehensive engineering analysis by a qualified professional engineer, using structural and seismic performance requirements and design criteria indicated.

B. Structural Performance: Grilles and screens shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.
   1. Wind Loads: Determine loads based on pressures as indicated on Drawings and in accordance with ASCE 7.
   2. Deflection Limits: For wind loads, no greater than [**1/180**] [**1/240**] of the perimeter framing member span and [1/60] [1/90] center of panel.

C. Seismic Performance: Grilles and screens, including attachments to other construction, shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.03 METALS, GENERAL

A. Fabricate products from sheet metal without pitting, seam marks, roller marks, stains, discolorations, or other imperfections where exposed to view on finished units.

2.04 MATERIALS

A. Galvanized-Steel Sheet: ASTM A 653/A 653M, [**G60**] [**G90**] zinc coating, mill phosphatized.

2.05 MISCELLANEOUS MATERIALS

A. Fasteners: Use types and sizes to suit unit installation conditions.
   1. For fastening galvanized steel, use hot-dip-galvanized steel or 300 series stainless-steel fasteners.
   2. Dissimilar Metals: [**Type 304**] [**Type 316**] stainless-steel fasteners.
   3. For color-finished grilles [**and**] [**screens**], use fasteners with heads that match color of grille [**screen**].

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B. Sealants, Exterior: Elastomeric sealant complying with Section 07 92 00 "Joint Sealants" and as recommended in writing by decorative formed metal manufacturer.

C. Fasteners for Anchoring to Other Construction: Unless otherwise indicated, select fasteners of type, grade, and class required to produce connections suitable for anchoring indicated items to other types of construction indicated.

D. Isolation Coating: Manufacturer's standard [**alkali-resistant coating**] [**bituminous paint**] [**epoxy coating**].

2.06 FABRICATION, GENERAL

A. Fabricate [grilles] [and] [screens] to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
   1. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of surfaces exposed to public view.
   2. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

2.07 FIXED SCREENS

A. Fabricate screens from steel sheet or plate of thickness, size, and pattern indicated. Form perforations by punching, cutting, or drilling to produce openings of sizes and shapes indicated. Roll, press, and grind perforated metal to flatten and to remove burrs and deformations.
   1. Drawings indicate perforated metal patterns required and are based on products of one manufacturer. Perforated metal patterns produced by other manufacturers may be considered, provided deviations are minor and do not change design concept as judged solely by Architect.

B. Fabricate frames from [**steel**] extruded [**aluminum**] [**brass**] [**bronze**] of profiles, and to sizes and shapes indicated. Miter frame members at corners and connect with concealed splice plates [**welded**] [**brazed**] to back of frames.
   1. Drawings may indicate frame profiles based on products of one manufacturer. Similar frame profiles produced by other manufacturers may be considered, provided deviations are minor and do not change design concept as judged solely by Architect.

C. Fixed Screens:
   1. Basis of Design: The design is based on Hendrick Architectural; [H-Clad] [Image-Clad]. Subject to compliance with requirements, manufacturers offering comparable systems that may be incorporated into the Work include, but are not limited to, the following:
      a. BOK Modern.

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b. Northclad.

2. Panel Depth: [**2 inches**] [2.**5 inches**] <**Insert depth**>.

D. Attachment Assembly: [**Manufacturer's standard**] [**Flange attachment**] [**Clip**] [**Subgirt and spline**] [**Track support**] [**Rail support**] [**Rainscreen-principle system**].

2.08 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

2.09 GALVANIZED-STEEL SHEET FINISHES

A. Finish [grilles] [**and**] [**screens**] after assembly.

B. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and repair according to ASTM A 780.

C. Baked-Enamel or Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard 2-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil for topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.

1. Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Architect's sample**] [**As selected by Architect from manufacturer's full range**] <**Insert color and gloss**>.

D. High-Performance Organic Finish: [**2**] [**3**] [**4**]-coat fluoropolymer finish complying with [**AAMA 2604**] [**AAMA 2605**] and containing not less than [**50**] [**70**] percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Architect's sample**] [**As selected by Architect from manufacturer's full range**] <**Insert color and gloss**>.

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PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal, seismic, and structural movement.

B. Attachment Assembly, General: Install attachment assembly required to support grilles and screens including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.
   1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.

C. Install support assembly at locations, spacings, and with fasteners recommended by manufacturer. Use manufacturer's standard horizontal and vertical members that provide support and secondary drainage assembly, draining to the exterior at horizontal joints.
   1. Install panels to allow individual panels to be installed and removed without disturbing adjacent panels.

D. Provide anchorage devices and fasteners where needed to secure to in-place construction.

E. Set products accurately in location, alignment, and elevation, measured from established lines and levels.

F. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by manufacturer.

G. Repair damaged finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory and refinish entire unit or provide new units.

3.02 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align grille and screen units within installed tolerance of 1/4 inch in 20 feet, non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inchoffset of adjoining faces and of alignment of matching profiles.

3.03 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as units are installed, unless otherwise indicated in manufacturer's written installation instructions.

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On completion of installation, clean finished surfaces as recommended by manufacturer. Maintain in a clean condition during construction.

B. Replace grilles and screens that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

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SECTION 11 12 33.21 - SWING ARM BARRIER GATES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Manual swing arm barrier gates.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for swinging barrier gate assemblies.

B. Shop Drawings:
   1. Include plans, elevations, sections and attachment details.
   2. Include details of gate assemblies. Indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.

1.03 INFORMATIONAL SUBMITTALS

A. Design Data Submittal: For structural performance of gate assemblies, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.04 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For swinging barrier gates to include in emergency, operation, and maintenance manuals.

1.05 FIELD CONDITIONS

A. Field Measurements: Verify layout information for gates shown on Drawings. Verify dimensions by field measurements.

1.06 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of gates that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Failure to comply with performance requirements.

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b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: [**Five**] [**15**] <**Insert number**> years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Structural Performance:
1. Gate assemblies shall withstand the design wind loads and stresses for gates under exposure conditions indicated according to ASCE/SEI 7.
   a. Design Wind Load: [**As indicated on Drawings**] <**Insert loads**>.
2. Gate assemblies shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   a. Gate Arms:
      1) Uniform load of [**150 lbf/ ft.**] applied in any direction.
      2) Concentrated load of [**500 lbf**] applied in any direction.
      3) Uniform and concentrated loads need not be assumed to act concurrently.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
1. Temperature Change: [**120 deg F, ambient; 180 deg F, material surfaces**] <**Insert temperature change**>.

2.02 MANUAL SWING ARM BARRIER GATES

A. General: Provide manual swing arm barrier gate assemblies consisting of gate supports, hinges, gate locks, and gate arms and other components and accessories required for a complete assembly.
1. Manufacturers: Subject to compliance with requirements, [**provide products by the following**] [**provide products by one of the following**] [**available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**]:
   a. Commercial Door Company.
   b. Hoover Fence Company.
   c. Pisor Fence, Inc.
2. Basis-of-Design Product: Subject to compliance with requirements, provide [**Hoover Fence Company;**] [**S-Series**] [**Z-Series**] [**H-Series**] <**product name or designation**> [**in configurations indicated on drawings**] or a comparable product by one of the following:
   a. Commercial Door Company.

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3. Basis-of-Design Product: Subject to compliance with requirements, provide [**Commercial Door Company;**] <**product name or designation**> or a comparable product by one of the following:
   a. <**Insert manufacturer name**>.

B. Gate Assembly: ASTM F900 for gate posts and [**single**] [**double**] swing gate types.
   1. Gate Leaf Width: [**As indicated on drawings**] [**36 inches**] <**Insert width**>.

C. Galvanized-Steel Pipe and Tubing: Fabricate swing arms from [**round**] [**rectangular**] tubes in sizes indicated on drawings and as required to meet performance requirements indicated, formed from 0.108-inch nominal-thickness minimum metallic-coated steel sheet or formed from 0.105-inch nominal-thickness minimum steel sheet and hot-dip galvanized after fabrication.
   1. Gate Posts: [**As indicated on drawings**] [**Round tubular steel**] [**Rectangular tubular steel**] [**Rectangular tubular steel**] [**Round tubular aluminum**] [**Rectangular tubular aluminum**].
   2. Gate Arms: [**As indicated on drawings**] [**Round tubular steel**] [**Rectangular tubular steel**] [**Rectangular tubular steel**] [**Round tubular aluminum**] [**Rectangular tubular aluminum**].
   3. Gate Stope Posts: [**As indicated on drawings**] [**Round tubular steel**] [**Rectangular tubular steel**] [**Rectangular tubular steel**] [**Round tubular aluminum**] [**Rectangular tubular aluminum**].

D. Gate Arm Corner Construction: Welded.

E. Hardware: Latches permitting operation from both sides of gate, hinges, and keepers for each gate leaf more than 5 feet wide. Provide cane bolts for pairs of gates.[**Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.**]

F. Hinges: Manufacturer's standard swing arm gate hinges suitable for exterior use.
   1. Material: Hot-dip galvanized steel.

G. Post Caps: [**Formed from steel sheet and hot-dip galvanized after forming**] [**Aluminum castings**].

H. Cane Bolts: Provide for inactive leaf of pairs of gates. Fabricated from [**1/2-inch-**] [**3/4-inch-**] diameter, round steel bars, hot-dip galvanized after fabrication. Finish to match gates. Provide galvanized-steel pipe strikes to receive cane bolts in [**closed position**] [**both open and closed positions**].

I. Finish exposed welds to comply with NOMMA Guideline 1, [**Finish #2 - completely sanded joint, some undercutting and pinholes okay**] [**Finish #3 - partially dressed weld with splatter removed**] [**Finish #4 - good-quality, uniform undressed weld with minimal splatter**].

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J. Anchor Bolts and Fasteners: Galvanized.
1. Hot-dip galvanized according to ASTM A153/A153M and ASTM F2329/F2329M.

2.03 GATE MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

B. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.

C. Uncoated Steel Sheet: [**Hot-rolled steel sheet, ASTM A1011/A1011M, Structural Steel, Grade 45**] [**or**] [**cold-rolled steel sheet, ASTM A1008/A1008M, Structural Steel, Grade 50**].

D. Galvanized-Steel Sheet: ASTM A653/A653M, structural quality, Grade 50, with [**G90**] [**G60**] coating.

E. Aluminum-Zinc, Alloy-Coated Steel Sheet: ASTM A792/A792M, structural quality, Grade 50, with AZ60 coating.

F. Iron Castings: Either gray or malleable iron unless otherwise indicated.
1. Gray Iron: ASTM A48/A48M, Class 30.
2. Malleable Iron: ASTM A47/A47M.

G. Aluminum Castings: ASTM B26/B26M, Alloy A356.0-T6.

H. Galvanizing: For components indicated to be galvanized and for which galvanized coating is unspecified, hot-dip galvanize to comply with ASTM A123/A123M. For hardware items, hot-dip galvanize to comply with ASTM A153/A153M.

2.04 MISCELLANEOUS MATERIALS

A. Gate Hardware:
1. Spring Pin Latches: Provide for locking gate arms into both open and closed positions. Fabricated from3/4-inch-diameter, round steel pins, hot-dip galvanized after fabrication. Finish to match gates. Provide strike holes to receive pins.
2. Provide center gate stops for pairs of gates. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.

B. Grease Fittings: Provide grease fittings welded into place for each active leaf.

C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.

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2.05 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form exposed work with accurate angles and surfaces and straight edges.

D. Weld corners and seams continuously to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.

E. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

2.06 FINISHES

A. Coating System: Apply primers and topcoats that comply with Section 09 91 00 "Painting."

PART 3 - EXECUTION

3.01 INSTALLATION OF SWING ARM BARRIER GATES

A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

B. Post Setting: Set posts in concrete into firm, undisturbed soil.
   1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
   2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

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C. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

3.02 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Lubricate gates, gate hardware and other moving parts.

END OF SECTION

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SECTION 11 68 23 – EXTERIOR COURT ATHLETIC EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes exterior court athletic equipment of the following types:
   1. Basketball equipment.
   2. Volleyball equipment.

B. Related Sections:
   1. Section 03 30 53 "Miscellaneous Cast-in-Place Concrete" for equipment to be cast in concrete footings.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For exterior court athletic equipment.
   1. Include plans, elevations, sections, and attachment details.

1.03 INFORMATIONAL SUBMITTALS

A. Setting Drawings: For embedded items and cutouts required in other work.

B. Sample Warranty: For special warranty.

1.04 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For exterior court athletic equipment to include in operation and maintenance manuals.

1.05 FIELD CONDITIONS

A. Field Measurements: Verify position and elevation of floor inserts and layout for exterior court athletic equipment.

1.06 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of exterior court athletic equipment that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Basketball backboard failures.

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2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Basketball backstops and anchors shall withstand the effects of earthquake motions determined according to [**ASCE/SEI 7**] <**Insert requirement**>.

2.02 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide <**product name or designation**> or a comparable product by one of the following:

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Bison, Inc.
2. Draper, Inc.
3. L.A. Steelcraft, a brand of Americana Outdoor.
4. Porter Athletic Equipment Company.

C. Source Limitations: Obtain each type of equipment from single source from single manufacturer.

2.03 BASKETBALL EQUIPMENT

A. Basis-of-Design Product: Subject to compliance with requirements, provide L.A. Steelcraft or a comparable product by one of the following:
1. Bison, Inc.
2. Draper, Inc.
3. Porter Athletic Equipment Company.

B. Source Limitations: Obtain from single source from single manufacturer.

C. Protruding fasteners or exposed bolt heads on front face of backboards are not permitted.

D. Connections: Manufacturer's standard connections or connections recommended in writing by manufacturer and complying with Section 05 50 00 "Metal Fabrications" of size and type required to transfer loads to building structure.

E. Post-Supported Backstops: Complete assembly, including support framing, bracing, fittings, hardware, equipment pads, and fasteners.
1. Basis-of-Design Product: L.A. Steelcraft Model #LA-12C56.

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2. Single: Manufacturer's standard gooseneck post assembly.

F. Basketball Backboards:
1. Basis-of-Design Product: L.A. Steelcraft Model #LA-05.
2. Shape and Size:
a. Fan-shaped, 54-inch maximum width by 39-inch maximum height.
3. Backboard Material: Provide with predrilled holes or preset inserts for mounting goals, and as follows:
a. Fiberglass: Minimum 1-1/2-inch- thick, composite backboard consisting of minimum two 3/16-inch- thick, molded-fiberglass panels laminated together over faces and edges encapsulating a 3/4-inch honeycomb core, reinforced at goal and backboard mountings, or a wood panel product core; with threaded inserts or embedded anchors for mounting backboard corners to support framing at standard mounting centers.
4. Finish: Manufacturer's standard factory-applied, white background.

G. Goal-Mounting Assembly: Compatible with goal, backboard, and backstop; with manufacturer's standard hole pattern for goal attachment.
1. Direct Mount: Designed for mounting goal directly and independently to center mast of backstop, so that no force is transmitted by ring directly to backboard, and rigidity and stability of goal are maximized.

H. Basketball Goals: Basket ring complete with flanges, braces, attachment plate, and evenly spaced loops welded around underside of ring.
1. Basis-of-Design Product: L.A. Steelcraft Model #LA-39.
2. Single-Rim Basket Ring Competition Goal: Materials, dimensions, and fabrication per manufacturer's standard design.
3. Type:
a. Fixed: Nonmovable.
4. Mount: Front.
5. Net Attachment: No-tie loops for attaching net to ring without tying.
6. Finish: Manufacturer's standard finish.

I. Basketball Nets: 12-loop-mesh net, between 15 and 18 inches long, sized to fit ring diameter, and as follows:
1. Basis-of-Design Product: L.A. Steelcraft Model #LA-34.
2. Cord: Made from white nylon.
3. Competition Cord: Antiwhip, made from white nylon cord, minimum 120-gm thread and maximum 144-gm thread.

2.04 VOLLEYBALL EQUIPMENT

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Bison, Inc.

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2. Draper, Inc.
3. L.A. Steelcraft, a brand of Americana Outdoor.
4. Porter Athletic Equipment Company.

B. Source Limitations: Obtain from single source from single manufacturer.

C. Post Standards: Removable, [**fixed-height**] [**adjustable-height, telescoping,**] paired volleyball post standards[**and a center post standard for multicourt play**], as indicated on Drawings, designed for easy removal from permanently placed floor inserts.
1. Materials: Manufacturer's standard metal pipe or tubing, with nonmarking plastic or rubber end cap or floor bumper to protect permanent flooring.
2. Nominal Pipe or Tubing Diameter: [**3-inch**] [**3-1/2-inch**] [**4-inch**] OD at base.
3. Finish: Manufacturer's standard [**factory-applied, polyester powder-coat finish**] [**or**] [**plated metal finish**].
4. Net Height Adjuster: Manufacturer's standard mechanism for height adjustment, complete with fittings; designed for positioning net at heights indicated.
   a. Net Heights: For ages 12 and under net height and boys'/men's volleyball net height, 84 and 95-5/8 inches or more.
5. Height Markers: Clearly marked at regulation play heights for [**elementary school**] [**girls/women**] [**boys/men**] [**sitting volleyball**] [**tennis**] <**Insert requirements**>.

D. Net: 32 feet long; one per pair of paired post standards; and as follows:
1. Width and Polyester Mesh: 36 inches with 4-1/2-inch- square mesh made of black polyester string.
   a. Hem Band Edges: White, 2-inch- wide top binding; black, [**3/4-inch-**] [**1-inch-**] wide bottom and side bindings; tie offs at top and bottom of each side end of net; and 1/4-inch- diameter rope, at least 42 feet long, threaded through top hem of binding.
2. Width and Nylon Mesh: Competition volleyball net, [**36 inches**] [**39 inches**] with 4-inch- square[**knotless**] mesh made of black nylon string.
   a. Hem Band Edges: White, minimum 2-inch- wide top, bottom, and side bindings; [**tie offs at top, bottom, and midpoint of each side end of net**] [**minimum 1-inch- wide tension straps at top, bottom, and midpoint of each side end of net**]; end sleeves for dowels; and lines with linkage fittings threaded through top and bottom hems of binding. Provide lengths of lines and linkage fittings as required to properly connect to and set up net for post-standard spacing indicated on Drawings.
      1) Top Line: Minimum [**1/4-inch- diameter rope**] [**1/8-inch- diameter, galvanized- or coated-steel cable**] <**Insert description**>.
      2) Bottom Line: Minimum [**1/4-inch- diameter rope**] [**1/8-inch- diameter, galvanized- or coated-steel cable**] <**Insert description**>.

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3. Dowels: Minimum 1/2-inch- diameter fiberglass or 1-inch- diameter wood. Provide two dowels per net threaded through each side hem sleeve for straightening net side edges.
4. Net Antennas: 3/8-inch- diameter, high-tensile-strength, extruded-fiberglass or plastic rods, 72 inches long, extending above top hem band of net, with alternating white and red bands according to referenced standard rules. Provide two antennas per net.
   a. Clamps: Designed to secure antenna to top and bottom of net.
5. Boundary Tape Markers: 2-inch- wide white strip[**with sleeve for securing net antenna**], secured to net top and bottom with hook-and-loop attachment. Provide two tape markers per net for marking court boundaries.

E. Net-Tensioning System: Designed to adjust and hold tension of net. Fully enclosed, nonslip, [**worm-gear**] [**rack-and-pinion**] [**ratchet**] [**manufacturer's standard**]-type winch with cable length and fittings for connecting to net lines, positive-release mechanism, and [**permanently fixed**] [**removable**] [**manufacturer's standard**] handle.[**Mount net tensioner on post standard at side away from court.**] Provide end post with post top pulley. Provide opposing post with welded-steel loops, hooks, pins, or other devices for net attachment and post top grooved line guide.

F. Bottom Net Lock Tightener: Manufacturer's standard quick-release-type tension strap; a spring-loaded, self-locking tensioner; a turnbuckle; a pulley; or other device and linkage fittings designed to quickly and easily tighten bottom line or net.

G. Judges' Stands: Manufacturer's standard[**adjustable-height**] units designed to be [**freestanding, folding for storage**] [**freestanding, folding for storage with wheels for transporting**] [**attached to and supported by post standard**]. Fabricate welded-steel tubing units with finish and color to match post standards.

H. Post Standard Transporter: Manufacturer's standard wheeled unit designed for transporting a single post.

I. Storage Cart: Manufacturer's standard wheeled unit designed for transporting and storing volleyball equipment and passing through [**36-inch-**] **<Insert dimension>** wide door openings. Fabricate welded-steel tubing units with heavy-duty casters, including no fewer than two swivel casters. Fabricate wheels from materials that do not damage or mark floors; number of units as required to provide transport and storage for specified equipment.

2.05 TETHERBALL EQUIPMENT

A. Basis-of-Design Product: Subject to compliance with requirements, provide L.A. Steelcraft Model #TBPCB.

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2.06 MATERIALS

A. Castings and Hangers: Malleable iron, according to ASTM A47/A47M; grade as required for structural loading.

B. Anchors, Fasteners, Fittings, and Hardware: Gymnasium equipment manufacturer's standard corrosion-resistant or noncorrodible units; concealed.

C. Grout: Nonshrink, nonmetallic, premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout, according to ASTM C1107/C1107M, with minimum strength recommended in writing by gymnasium-equipment manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for court layout, alignment of mounting substrates, installation tolerances, operational clearances, and other conditions affecting performance of the Work.
1. Verify critical dimensions.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions.

B. Anchoring to In-Place Construction: Use anchors and fasteners where necessary to secure built-in and permanently placed exterior athletic court equipment to structural support and to properly transfer load to in-place construction.

C. Connections: Connect electric operators to building electrical system.

3.03 ADJUSTING

A. Adjust movable components of gymnasium equipment to operate safely, smoothly, easily, and quietly; free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range; and lubricate as recommended in writing by manufacturer.

END OF SECTION

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SECTION 26 05 00 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.01 SUMMARY

A. This section describes the basic requirements for the electrical work on this project

B. This Section defines the Electrical Acceptance Tests and checks that shall be made on all electrical equipment and wiring to ensure compliance with all applicable Codes and Standards, and with the requirements of the Contract Documents.

C. All electrical equipment testing, and related costs shall be included in the Contractor’s bid.

D. This section covers the Contractor's responsibilities for commissioning; each subcontractor or installer responsible for the installation of a particular system or equipment item to be commissioned is responsible for the commissioning activities relating to that system or equipment item.

E. The Commissioning Authority (CA) directs and coordinates all commissioning activities and provides Prefunctional Checklists and Functional Test Procedures for Contractor's use.

F. The entire electrical system is to be commissioned, including commissioning activities for the following specific items:
   1. Client education of operations.
   2. Documentation archived to client.
   3. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.

G. The Prefunctional Checklist and Functional Test requirements specified in this section are in addition to, not a substitute for, inspection or testing specified in other sections.

1.02 WORK INCLUDED

A. Furnish and install a fully functional electrical power system including all panelboards, transformers, breakers, conduit, wiring, relays, and other material as shown on in the Electrical Drawings and specified herein. It is the intent that a complete operating system conforming to all applicable codes and District Standards be installed and that any power supplies, disconnect, relays, controls, programming or other items required to achieve this end result shall be furnished whether or not such item or items are specified herein.

B. Site Investigation: The bidding contractor for the electrical power system shall visit the site prior to the bid and become thoroughly knowledgeable about the site and work required to perform work of this section. Failure to appropriately estimate the equipment, materials, and labor required to complete the entire scope of work will not relieve the contractor from completing the work at no additional cost.

C. Provide connections of all equipment specified under these sections and all other relevant Divisions

1.03 REFERENCES AND STANDARDS

A. California Electrical Code (CEC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Energy Code (CENC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. National Electrical Contractors Association (NECA): Standard of Installation

D. National Fire Protection Association (NFPA): 70E

E. National Safety Council (NSC)

F. Occupational Safety and Health Administration (OSHA)

1.04 GENERAL REQUIREMENTS

A. The Contractor shall test equipment of all kinds installed on this project to determine whether it fulfills the requirements of these Specifications. The Contractor shall furnish all labor necessary to adjust the operation of the apparatus and make the connections for the tests. After the tests have been completed, the Contractor shall restore all connections, apparatus, etc., to their original condition.

B. The Contractor shall retain the services of a qualified Independent Testing Agency holding a valid current C-10 License to perform certain tests and prepare reports, as enumerated in the following Articles. The Independent Testing Agency shall be a company that specializes in electrical equipment testing and shall be NETA or NICET certified.

C. Contractor shall obtain approval from the architect of proposed independent testing agency(s) before any testing is started.

D. Electrical systems, equipment and materials shall be tested prior to final acceptance of the work.

1.05 LOCAL CONDITIONS

A. Examine site; verify dimensions and locations against drawings and become informed of all conditions under which work is to be done before submitting proposal. No allowance will be made for extra expenses because of omission on Contractor's part to include cost of work under prevailing conditions.

B. Information shown relative to services is based upon available records and data shall be regarded as approximate only. Minor deviations found necessary to conform with actual locations and conditions shall be made without extra cost.

C. Extreme care shall be exercised in excavating near existing utilities to avoid any damage thereto. It shall be the contractor's responsibility to verify existing underground utilities prior to digging anywhere. Information provided on these plans indicating existing conditions shall only be used as reference, and shall not be deemed considered accurate. Any damage to existing utilities done by the contractor shall be repaired and/or replaced by the contractor at their expense to its pre-damage condition.

1.06 PERMITS AND INSPECTIONS

A. Obtain and pay for all permits and service charges required in installation of the work. Arrange for required inspections and secure approvals from authorities having jurisdiction.

B. During its progress, work shall be subject to inspection by Project Inspector.

1.07 INDEPENDENT TESTING AGENCY REQUIREMENTS

A. The Independent Testing Agency shall furnish personnel acceptable to Engineer to conduct all testing. Supervising engineer shall have a minimum of five years experience in testing of equipment of the type to be tested on this Project.

B. The Independent Testing Agency shall furnish all labor required for and incidental to testing.

C. The Independent Testing Agency shall provide minor field repairs, adjustments, and wiring modifications at the time of inspection and testing.

D. The Independent Testing Agency shall furnish all necessary test equipment to satisfactorily perform all tests specified herein.

E. The Independent Testing Agency shall check all devices for proper operation - checking for wear, tightness, dirt, etc.

F. The Independent Testing Agency shall check for conformance to published curves.

G. The Independent Testing Agency shall notify and coordinate with the Owner's representative at least 3 working days prior to the commencement of any Electrical Acceptance Testing. Tests shall be witnessed by the Owner's representative unless such witnessing is waived in writing by the Owner's Representative.

1.08 CODES AND STANDARDS

A. Work and materials shall be in full accordance with California Occupational Safety Health Act (CAL-OSHA), California Electrical Code (CEC), State Fire Marshal, Electrical Safety Orders (Title 8, Subchapter 5), the National Fire Protection Association, California Building Code (CBC); California Code of Regulations - Title 24 and other applicable State or local laws or regulations. Nothing in the Drawings or Specifications shall be construed to permit work not conforming to these codes.

B. Electrical materials shall bear the label of, or be listed by, the Underwriter's Laboratories (UL) unless of a type for which label or listing service is not provided.

C. Materials and components shall conform to Industry Standards, including:

NEMA	-	National Electrical Manufacturer's Association
ANSI	-	American National Standards Institute
ASTM	-	American Society For Testing Material Association
IPCEA	-	Insulated Power Cable Engineer's Association
CBM	-	Certified Ballast Manufacturers

D. When Contract Documents differ from governing codes, furnish and install larger size or higher standards called for without extra charge.

E. Manufacturer's Instructions and Maintenance Manual applicable to each particular apparatus.

F. National Electrical Testing Association (NETA) "Acceptance Testing Specifications".

G. Procedures as directed by Engineer.

1.09 CARE AND PRECAUTIONS

A. Contractor shall be responsible for any damage to equipment or material due to improper test procedures or test apparatus handling, and shall replace or restore to original condition, any damaged equipment or material.

B. Contractor shall furnish and use safety devices such as rubber gloves and blankets, protective screens, barriers, and danger signs to adequately protect and warn all personnel in the vicinity of the tests.

1.10 EQUIPMENT TO BE TESTED BY CONTRACTOR

A. Perform the visual inspections, manual operations and tests on systems and equipment as described in Part 3, "Execution".

B. Molded Case Circuit Breakers Rated Less Than 100A

C. Disconnect Switches

D. Lighting

1.11 EQUIPMENT TO BE TESTED BY INDEPENDENT TESTING AGENCY

A. Circuit Breakers Rated 100A and Greater

B. Grounding System

C. Panels

D. Power Cable

1.12 REVIEW OF MATERIALS

A. Prior to commencement of Work and within 35 days after award of contract, submit for approval in accordance with General Conditions all equipment and materials to be furnished.

1. Equipment/Product submittals shall be bound and indexed and shall include a table of contents listing all equipment submitted. The table of contents shall include: Project designation, submittal number, submittal name including specification section, date, and include manufacturer, model number, reference specification paragraph or sheet detail number, description, and page location. Where a group or series of products are submitted, each item does not have to be listed, only the series need to be identified. Example:

Project:
Submittal No.
Submittal Name:
Date:

Page(s)	Manufacturer	Spec para., Model No.	Detail No.	Description
1-12	**XYZ Corp**	**123ABC**	**2.05**	**Control panel**
13,14	**XYZ Corp**	**456DEF**	**2.06-A**	**Power supply**
15	**ABC Corp**	**789GHK**	**A/E9.5**	**Rack**
16,17	**Cantex**	**PVC-40**	**2.01**	**PVC conduit**
18	**Steel City**	**XYZ series**	**2.02**	**Steel fittings**

2. Shop drawings submittals shall be neat and professionally done using CAD (computer aided drafting), hand-drawn submittals will not be accepted. Shop drawings shall have sufficient information to clearly indicate work to be performed and be complete including device/equipment locations, wire sizes, wire types and number of wires, symbol list or legend, point-to-point connections, wiring diagrams, and equipment anchorage detail where needed. Shop drawings shall utilize the same size paper as the Bid set of plans.
3. Electronic submittals in PDF format are allowed and preferred.

B. Substitutions:
1. Only one request for substitution will be considered on each item of material or equipment. No substitutions will be considered thereafter. Substitutions will be interpreted to be all manufacturers other than those specifically listed by model or catalog number. Should the original submittal of a proposed substitution be rejected, the specified item shall be furnished.
2. Submit complete information or catalog data to show equality of equipment or material offered to that specified. Identify which product is being substituted in the specifications and/or the plans and provide analysis as indicating either it "Complies" or that it "Does Not Comply" and providing a reason. Each Specification paragraph shall be provided with this analysis. No substitutions will be allowed unless requested and approved in writing. Materials of equal merit and appearance, in the opinion of the Engineer, will be approved for use. Engineer reserves the right to require originally specified item.
3. Acceptance of a substitute is not to be considered a release from the Specifications. Any deficiencies in an item, even though approved, shall be corrected by the Contractor at his expense.
4. Responsibility for installation of approved substitution is included herein. Any changes required for installation of approved substituted equipment shall be made without additional cost to Owner.

C. Where it is in the best interest of the Owner, Engineer may give written consent to a submittal received after expiration of designated time limits, or for an additional resubmittal.

D. Submit for approval in ample time to avoid delay of construction, shop drawings or submittals on all items of equipment and materials covered in list mentioned above. Submit in accordance with General Conditions in a complete package; partial submittals will not be considered.

E. Failure to comply with any of the preceding requirements will necessitate that the specified materials be submitted and supplied.

1.13 RECORD DRAWINGS

A. Upon completion of Work, furnish Engineer with Autocad file, PDF file, and one printed full-size hardcopy upon which shall be shown all Work installed under contract including any work which are not in accordance with Original Contract Drawings.

Autocad files shall be 2004 or later version, with external references bound to its parent drawing. Provide a separate PDF file for each sheet, do not combine all sheets into a single file. Furnish digital files on a USB flash drive or CD.

1. The above shall also include shop drawings.

B. All symbols and designations used in preparing Record Drawing shall match those used in Contract Drawings.

C. Show all buried and concealed conduit, stub-outs, etc. Locate all buried conduit and stub-outs by dimensions from permanent, easily located and identifiable portions of structure; also, dimension ends of stub-outs, etc. Note depth of buried items below grade.

1.14 ADDENDA AND CHANGE ORDERS

A. Changes in the plans and specifications shall be made by Addenda or Change Orders signed by the Architect and Engineer.

1.15 RELATED REQUIREMENTS

A. Section 01 77 00 - Closeout Submittals: Scope and procedures for operation and maintenance manuals and project record documents.

1.16 SUBMITTALS

A. Submittals for this Section shall be made according to the Conditions of the Contract, Division 1 Specification Sections and Division 26 Specification Sections

B. Field Test Reports (including Energy Code Acceptance Tests)
   1. Provide written test reports, signed and dated, for all tests prior to acceptance of the tested equipment by the Owner.
   2. Submit certified reports of Independent Tests and Observations indicating and interpreting test results specified in Part 3 of this Section.
      a. The Test Report shall include the following:
         1) Description of equipment tested.
         2) Description of test procedure.
         3) Calibration record for all testing devices used.
         4) Test results.
         5) Recommendations.
         6) Appendix, including all field test reports.
      b. Furnish six copies of completed report to the Electrical Engineer no later than ten days after test completion unless requested otherwise by Owner.
      c. Instrumentation-Traceability: The testing agency shall provide calibration labels for all relays and circuit breakers tested.
      d. Labels shall be self-adhesive and placed on covers or frames so as not to obscure nameplate, tap block or time dial. Label shall indicate date tested and firm name.

C. Updated Submittals: Keep the Commissioning Authority informed of all changes to control system documentation made during programming and setup; revise and resubmit when substantial changes are made.

D. Prefunctional Checklists and Functional Test Procedures for Control System: Detailed written plan indicating the procedures to be followed to test, checkout and adjust the control system prior to full system Functional Testing; include at least the following for each type of equipment controlled:
   1. System name.
   2. List of devices.
   3. Step-by-step procedures for testing each controller after installation, including:
      a. Process of verifying proper hardware and wiring installation.
      b. Process of downloading programs to local controllers and verifying that they are addressed correctly.
      c. Process of performing operational checks of each controlled component.
      d. Plan and process for calibrating all sensors.
      e. Description of the expected field adjustments for controllers and sensors should control responses falling outside of expected values.
   4. Copy of proposed log and field checkout sheets to be used to document the process; include space for initial and final read values during calibration of each point and space to specifically indicate when a sensor or controller has “passed” and is operating within the contract parameters.
   5. Description of the instrumentation required for testing.

E. Startup Reports and Prefunctional Checklists: Submit for approval of Commissioning Authority.

F. Project Record Documents: See Section 01 78 39 for additional requirements.
   1. Submit updated version of control system documentation, for inclusion with operation and maintenance data.
   2. Show actual locations of all sensors and control devices on project record drawings.

G. Training Manuals: See Section 01 79 00 for additional requirements.
   1. Provide three extra copies of the controls training manuals in a separate manual from the O&M manuals.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials mentioned herein or on drawings require that each item listed be provided and of quality noted, or an approved equal. All material shall be new, full weight and standard in all respects and in first-class conditions. Where possible, all materials used shall be of the same brand or manufacturer throughout for each class of material or equipment.

B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein. Dimensions, sizes and capacities shown are a minimum and shall not be changed without permission of Engineer.

2.02 CONDUIT

A. Conductors in the same raceway shall originate from the same panel.

B. Rigid Steel Conduit: Standard weight, mild steel pipe, zinc coated on both inside and outside by a hot dipping or sherardizing process. Inside and outside of conduit shall be finished with a protective coating. All threads galvanized after cutting. Meets UL 6, UL Card #DYIX, and ANSI C80.1.

C. Electrical Metallic Tubing (EMT): Cold rolled steel tubing, hot-dipped galvanized, with zinc coating on outside and protective lubricating coating on inside. Fittings shall meet same requirements for finish and material as EMT. Meets UL 797 and ANSI C80.3.

D. Flexible Conduit: UL Listed. Flexible steel, coated on both inside and outside by hot dipping or sherardizing process. Liquid-tight conduit shall be galvanized with extruded polyvinyl covering and with watertight connectors, sunlight resistant, direct burial rated. Flexible steel conduit less than 1/2" shall not be used except that 3/8" shall be permitted in lengths not in excess of 6 feet as part of a listed assembly or for tap connections to lighting fixtures as required in CEC Section 410-67(c). Flexible conduit to be one continuous length, no couplings. AFC Liquid-Tuff Type-LFMC and AFC Reduced Wall Flexible Steel Conduit, or equal.

E. PVC Conduit:
1. Type 40, 90ºC, UL listed, composed of polyvinyl chloride, conforming to NEMA TC-2, Fed Spec WC1094A, UL651 Standards. Material shall have minimum tensile strength of 6,500 psi at 73.4ºF, flexural strength of 12,500 psi and compressive strength of 9,000 psi per ASTM testing. PVC conduit shall be suitable for direct burial without concrete encasement. Fittings shall be of same manufacture. All joints shall be solvent welded.
2. Type 80, similar to type 40 except with extra heavy wall.
3. Only manufactured elbows/bends shall be used. Where field bends have to be made, obtain prior approval by the engineer.

F. Raceway Fittings:
1. Rigid Steel Conduit: Fittings, such as couplings, connectors, condulets, elbows, bends, etc., shall be subject to same requirements as for rigid steel conduit. Couplings and unions shall be malleable iron, threaded type, assembled with anti-corrosion, conductive anti-seize compound at joints made absolutely tight to exclude water. Connectors shall be threaded hubs with bonding insulated metallic bushings.
2. EMT: Fittings shall be steel, box connectors shall have insulated throat. Connectors and couplings to be compression type.

3. Flexible Metallic Conduit: FMC shall be steel. Connectors to be insulated. Metallic connectors shall compression type.
4. Bushings: Metallic insulated type. Weatherproof or dust-tight installations; liquid-tight with sealing ring and insulated throat, OZ/Gedney type "KR".
5. Expansion and Deflection Fittings: OZ/Gedney, Type "DX" or accepted equal.
6. All box connectors to be insulated throat type.
7. PVC Conduit: Fittings shall be same grade of material as conduit, solvent welded to conduit.

G. Metallic conduits, raceways, and fittings shall be listed and approved as a grounding means.

2.03 BOXES

A. Galvanized one-piece or welded pressed steel type. Boxes for fixture shall not be less than 4" square. Boxes shall be at least 1-1/2" deep, 4" square for 1 or 2 gang devices,
1. 1-gang and 2-gang outlet and junction boxes installed exposed outdoors shall be weatherproof malleable iron boxes, Appleton or equal. Plug all unused hubs.
2. Provide 1#12 equipment grounding pigtail at all outlet boxes.

B. Junction boxes located outdoors, or in wet or damp locations shall be rated NEMA-3R, with while-in-use hinged metal door and pad-locking tabs.

C. Equipment furnished by other trades but requiring electrical connection shall be provided with appropriate junction box or other means of connection per equipment installation manual.

D. Manufacturer for outlet and junction boxes to be Spring City Electrical Manufacturing Company, or accepted equal

2.04 WIRES

A. Wire shall be copper only, manufactured by General Cable Co., Rome, General Electric Co., or Anaconda. Wire shall be rated 90 degrees C for both dry and wet locations, THWN-2, XHHW-2, or RHW-2 insulation. 90 degrees C THHN may be used in dry and damp locations.
1. Feeders sized #2 and larger routed below grade shall use types XHHW-2, THW-2, THWN-2, or RHW-2 insulation, 90 degrees C dry and wet rated.

B. Wire shall be Code type copper wire of not less than 98% conductivity. Wires #8 gauge and larger, shall be stranded. Wires shall bear the Underwriters' label, be color coded and be marked with gauge, type and manufacturer's name on 24" centers. Wires smaller than #8 shall be stranded. Where stranded wire is used, provide solid pigtail for connection to screw terminals of receptacles, switches, etc.

C. Color coding to be as follows:

	208/120 Volts	480/277 Volts
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Natural Grey
Ground	Green	Green

Switch legs shall use the same branch circuit phase color coding which they are connected to. IG ground wire shall be green with yellow tracer.

D. Any raceway shall have only one voltage present.

2.05 CONVENIENCE OUTLETS

A. Shall be "Specification" grade rated 20 amperes at 125 volts, duplex, composition base with slots to accommodate parallel plug caps with grounding peg. Outlet shall be UL listed. Receptacles to be:
   1. 20 Amp: Leviton 5-20R or equal
   2. Other designations as noted below:
      a. Ground Fault: GFR
      b. Tamper Resistant: TR
      c. Weather Resistant: WR
      d. Isolated Ground: IG

B. Provide devices with matching plates. Isolated ground (IG) receptacles shall be orange with matching color plate. Hospital grade receptacles shall have a distinctive "green" dot. GFI receptacles shall have a visible (light) indicator. Receptacles and switches shall be terminated with “stakon” type fork on ring crimp terminal.

C. All 20 Amp, 125V and 250V non-locking receptacles (NEMA 5-15, 5-20, 6-15, 6-20) located outdoors and/or in damp or wet locations shall be listed weather-resistant type. Weather resistant receptacles shall be the same grade or class as and 20A receptacles specified above.

D. Weatherproof covers for receptacles in wet locations shall be rated as weatherproof whether or not a plug is inserted (NEMA-3R), minimum 3.25" clearance from front of receptacle, metallic cast type with hinged lid and padlocking hasp, Leviton or equal. Weatherproof covers for receptacles in damp locations shall be rated as weatherproof when attachment plug is removed, with metallic cast cover and flip lids with padlocking hasp.

E. Provide a separate GFI duplex receptacle at each location identified on the drawings and as specified. Through wiring is not acceptable. Receptacles located outdoors shall be GFI type, whether indicated in the plans or not.

2.06 PANELBOARDS

A. Panelboards shall meet NEMA AB-1, PB-1, PB1.1, PB1.2. Panelboards shall be type NQOD, NEHB, and I-Line as specified for secondary utilization voltage and phase. As manufactured by Square-D, or approved equal. Square-D has been used for design purposes. Busses shall be copper. Provide with neutral buss and copper ground buss. Series rated equipment are not acceptable. Panels shall have full height fully rated bussing.

B. Circuit breakers shall be bolt-on type thermal magnetic, single-pole and multi-pole for branch circuit control with trip-rating permanently marked on the handle. Where trip-rating is not marked on the handle, provide engraved label adjacent to the breaker indicating amperage rating. Multi-pole breakers shall be common trip type with single handle. Factory assembled and listed multi-pole breakers with handle ties shall be acceptable. Bails will not be accepted except where used with multi-wire branch circuits through fluorescent lighting fixtures. All circuit breaker handles shall be equipped with padlocking tabs, "lock-off" device. All circuit breakers shall be fully rated to withstand the available short circuit current as designated on the drawings. Series rated equipment will not be acceptable. Manufacturer shall be Square D, or approved equal.
   1. Circuit breakers 300 amps and higher shall be solid state type with field adjustable Long- Time and Instantaneous settings and field replaceable trip rating plugs.

C. Enclosures shall be code gauge, galvanized metal with front trim and hinged door with lock master keyed. Front trim shall be equipped with concealed trim clamps and concealed door hinges. Enclosures shall be rated NEMA-1 at dry indoor locations, and NEMA-3R where located outdoors in damp or wet locations. Lighting and appliance branch circuit Panelboards shall be maximum 20" wide and 6" deep. Panel trim and cabinet shall be finished ANSI-49 or ANSI-61 gray, except panel cabinets to be recessed are not required to be painted. Surface cabinets shall be without knockouts. Inside door shall have frame for circuit identification card. Fill out card, typewritten, with list of circuits corresponding with the circuit number. Identification shall be specific with room designation, type of load, etc, (i.e., "Classroom 214 receptacles"). For distribution panels, provide engraved laminated labels for load served, where identification card is not provided.

D. Panelboard submissions shall include a ladder diagram, physical and electrical data, numbering and trip rating of each circuit breaker. Panelboard shall bear the UL label of approval.

E. Panelboard types as indicated on the drawings shall be the minimum size and type. Provide a larger size and type of panelboard as necessary for the breakers and features/accessories as indicated.

F. Circuit breaker arrangement shall be per the panel schedule.

G. Panel nameplate label shall identify panel, minimum AIC rating, and equipment it is fed from, example as follows, "PANEL-XXX, MAX. 22,000 AIC, FED FROM YYY". Where fed via a transformer, it shall read, "PANEL-XXX, MAX. 14,000 AIC, FED FROM YYY THRU TRANSF-ZZZ". Label shall be engraved plastic per section 26 05 00. 1/2 inch letters for panel identification.

2.07 SAFETY/DISCONNECT SWITCHES

A. Type "HD" Heavy Duty safety switches with externally operated handle. Switches shall be manufactured by Square D, or approved equal. Switches shall be rated 250 and 600 volts, A.C., of size and poles as shown on Drawings and as required. Disconnects used outdoor shall be in NEMA-3R. Provide fused switches with proper sized fuses where required by equipment manufacturer. All switches shall have pad- locking cover with interlocking cover. Switches shall be capable of be pad-lockable in the OFF position. Label switch with circuit identification, example "AC-1, HD1-24".

2.08 INDIVIDUAL CIRCUIT BREAKERS

A. Circuit breakers shall be molded case thermal magnetic type with trip rating as scheduled on drawings.
   1. Circuit breaker trip settings 300 amps and higher shall be solid state type with field adjustable Long-Time and Instantaneous settings and field replaceable trip rating plugs.
   2. Circuit breakers with trip settings 1200 amps and higher shall be solid state electronic type with full function trip units including: LTUP, LTD, STPU, STD, Inst PU, Inst OFF, GFPU, GFD.

B. Circuit breakers shall be quick-make, quick-break, trip free operation. The trip-free mechanism shall be independent of manual handle control. All circuit breakers shall be fully rated to withstand the available short circuit current as designated on the drawings. Series rated equipment will not be acceptable.

C. Breakers to be in NEMA-1 (indoor) or NEMA-3R (damp, wet, and outdoor) enclosures. NEMA-3R enclosures shall have the handle concealed behind the cover, and the hinged cover shall be provided with padlocking tabs. Each circuit breaker shall be identified with an engraved, laminated phenolic plate showing the load served or the function of the circuit breaker and trip rating. The nameplate shall be attached with oval head machine screws tapped into the front of the board. Equip breaker handles with padlocking "lock-off" devices.

2.09 PULL LINE

A. Furnish and install pull line in all unused (empty) raceways. Pull lines shall not rot or mildew.
   1. Conduits up to 1.5": 1/8" diameter braided line of polypropylene with 200 lbs. tensile strength, IDEAL, Jet-Line #232, or equal.
   2. Conduits 2" or larger: 3/16" polypropolene pull rope with 800 lbs. tensile strength, IDEAL Pro-Pull or equal.

B. Provide pull line in conduits for utility company systems, size and type per their requirements.

2.10 PRECAST CONCRETE PULLBOXES/HANDHOLES

A. Boxes shall be sized per California Electrical Code requirements. Design loads shall consist of live, dead, impact, hydrostatic, and other loads. Live loads shall be for H-20 and/or H-20-S16-44, or as required, per A.A.S.H.O. standard specifications for highway bridges with revisions. Design loads shall be sixteen KIPS. Concrete shall be per ASTM-C-33-64. Lightweight concrete shall conform to ASTM-C-33-64T. Cement shall be Portland Cement meeting ASTM-C-150 Type II standards. Compressive strength shall be minimum 4,000 psi at 28 days.

B. Larger Boxes (48" x 30" or larger): Precast high-density reinforced concrete with end and side knockouts, pulling-in irons. Minimum 4" wall thickness. Coordinate size of thinwall knockouts with manufacturer for conduit entry. Acceptable manufacturer shall be Christy, or approved equal.

C. Smaller Boxes (smaller than 48" x 30"): Precast high-density reinforced concrete with end and side knockouts, and extension as required. Minimum 1.5" wall thickness. Acceptable manufacturers shall be Christy, or approved equal.

D. Covers: Larger box covers, in other than concrete paving areas, shall be one or multi piece as required, steel checker plate, galvanized with anti-slip surface rated for parkway loading, with hold-down bolts. All other box covers shall be reinforce concrete with hold down bolts. Where susceptible to vehicular traffic, use H-20 rated traffic cover. All covers shall be factory marked, see drawings for marking/label required. If not noted, use the following markings:

SYSTEM	MARKING
Power 600 volts or less	Electrical
Power over 600 volts	Danger High Voltage-Keep Out
Telephone	Telephone
Clock, Unified Signal, etc.	Signal

Fire Alarm Fire Alarm

Television T.V.

Lighting Lighting

Grounding Ground

E. Installation:
1. Excavate around area to accept box, a minimum of 4" around all sides for ease of installation. Provide 12" of compacted pea gravel for bedding and/or to facilitate drainage.
2. Backfill shall consist sand or fine earth, compacted. Saturated soil or large rocks shall not be used. No voids shall remain between walls and native soil.
3. Grout and seal conduits at box entry with cement. Provide with conduit end bells.

F. Utility Co. boxes shall be per their requirements. Provide with ground rod as required.

G. The metal covers of lighting and power pull boxes shall be ground bonded to the circuit grounding conductor(s) in the pull box. The size of the bonding conductor shall be the same size as the associated circuit ground conductors.

2.11 GROUND RODS

A. Ground rods shall be 3/4 in dia. x 10 ft. copper clad steel.

2.12 SURGE PROTECTIVE DEVICE (SPD)

(Transient Voltage Surge Protector TVSS)

A. Where indicated at main service entrance, provide internally mounted SPD, Square-D SurgeLogic, Eaton Cutler-Hammer, G.E. or equal. Where internal mounting is not practical provide externally mounted with close nipple connection, Leviton 57000 Series or equal.
1. Minimum surge current rating: 160 kA per phase.
2. Clamping performance rating per UL1449 3rd edition:

Mode	120/208V	480/277V
L-N	400V	800V
L-G	400V	800V
N-G	400V	800V

B. SPD devices shall be Listed and Component Recognized in accordance with:
1. UL 1449 Third Edition.
2. UL 1283.
3. NEMA LS-1 (1992) Low Voltage Surge Protective Devices.
4. ANSI/IEEE C62.41, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits, Category-C.

5. ANSI/IEEE C62.45, Guide on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits.
6. Comply with CEC Article 285.

C. The SPD shall be rated to withstand the available fault current.

D. Noise rejection at 50 Ohms, 5K - 100 MHz dB = -20 to -40.

E. Maximum Continuous Operating Voltage (MCOV) shall be at least 115% of the nominal voltage. MOV's to be minimum 34mm diameter.

F. Features shall include clamping envelope tracking, parallel-operated, built-in redundancy provides complete protection on all phases, modular design allowing replacement of modules, normal mode and common mode protection for WYE-configured 3-phase systems, fuse protection for each module. Limited 5-year warranty.

G. The preferred method is to have the SPD unit internally mounted, which is either mounted directly to switchboard/panel bussing or within its enclosed compartment. Where external mounted unit is used, provide metal enclosure with hinged metal cover. External units shall be installed directly adjacent to panel it is protecting using close nipple connection. Provide in NEMA-3R cabinet where installed outdoors. Approx. size of 15.1"H x 13.1"W x 5.2"D.

2.13 SURFACE METALLIC AND NONMETALLIC RACEWAYS

A. The surface raceway system for branch circuit wiring and/or data network, voice, video and other low-voltage wiring shall be manufactured by the Wiremold Company, or equal. Raceway series as indicated on the plans. The raceway and all system components must be UL listed and exhibit non-flammable self-extinguishing characteristics. The raceway shall be a two-piece design with a base and a snap-on cover.
   1. The nonmetallic raceway base and cover shall be manufactured of rigid PVC compound, available in ivory color. Exposed cuts shall be covered with cover clips. Electrical circuits 120v and higher disallowed.
   2. The metal raceway base and cover shall be manufactured of galvanized steel, ivory finish and suitable for field painting.

B. A full compliment of fittings must be available including, but not limited to flat, internal and external elbows, tees, entrance fittings, boxes, covers, adapters, cover clips, and end caps. The fittings shall match the base and cover, and be of matching colors. All fittings shall be supplied with a base where applicable to eliminate mitering. A transition fitting shall be available to adapt to other Wiremold series raceways. Field cuts shall be clean, straight, and true with no rough edges.

C. For multicompartment raceways, device brackets shall be available for mounting standard devices in-line or offset from the raceway. A device bracket shall be available for mounting up to four devices at one location. Faceplates shall match and fit flush in

the device plate and shall overlay the cover and base to hide uneven cuts. They shall match the raceway base and cover. The raceway manufacturer will provide a complete line of connectivity outlets and modular inserts for UTP (i.e. data jacks), STP (150 ohm), Fiber Optic, Coaxial and other cabling types with face plates and bezels to facilitate mounting.

D. Work shall include furnishing all raceway and appropriate fittings and device plates to install a nonmetallic surface raceway system. Installer shall comply with detailed manufacturer's instruction sheets, which accompany system components as well as system instruction sheets.

2.14 COVER PLATES

A. Each receptacle shall have its circuit identification on the cover plate (i.e., "LA1-12"). Use typewritten "clear tape". Use black letters/numbers. Clean surface before adhesive tape is applied, and wrap tape around each end to prevent pealing. Manufacturer to be Leviton, or approved equal.

2.15 TESTING EQUIPMENT

A. Furnish suitable electrical instruments including voltmeters, ammeters, wattmeters, tachometers and all other equipment necessary to perform tests specified.

B. Make necessary openings in circuits for testing instruments and place and connect all instruments, equipment and devices necessary for the tests. Upon completion of tests, remove instruments and instrument connections and restore all circuits to permanent condition.

C. Provide all standard testing equipment required to perform startup and initial checkout and required functional performance testing; unless otherwise noted such testing equipment will NOT become the property of Owner.

D. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.

2.16 TESTING COORDINATION

A. Coordinate activities and cooperate with others on the Project to ensure that systems are energized when required, when loads are applied, and that other requirements of this Section of the Specifications are carried out in a timely, coordinated basis.

B. Conduct tests in the presence of the Architect/Engineer and the Construction Manager. Notify the Architect/Engineer and Construction Manager seven calendar days or more

in advance when any test is to be performed, and do not start tests without the permission of the Architect/Engineer and Construction Manager.

C. Make up no permanent connections until correct phase sequence of all equipment is determined.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor shall provide Acceptance Testing on the entire Electrical System. Certain of this testing shall be performed by an Independent Testing Agency as indicated.

B. Acceptance Testing shall include Visual Inspections, Manual Operations, Electrical Tests, and Functional Testing.

C. Whenever possible, all Visual Inspections, Manual Operations and Electrical Tests shall be made just prior to energizing the equipment or circuits, and shall be coordinated with the field schedule and field conditions.

D. Test reports on megger, dielectric absorption and high potential tests shall include the ambient temperature and relative humidity existing at the time of the tests.

E. Should any piece of apparatus or any material or work fail during any of these Tests, it shall be immediately removed and be replaced by perfect material by this Contractor at his expense and the portion of the work replaced be again tested by the Contractor.

F. Before testing and energizing a system, all necessary precautions shall be taken to ensure the safety of personnel and equipment. All conductors and all electrical equipment shall be properly insulated and enclosed. All enclosures for conductors and equipment shall be properly grounded. Insulation resistance measurements must have been made and approved on all conductors and energized parts of electrical equipment.
   1. During actual testing, the Contractor or Independent Testing Agency shall:
      a. Ensure that temporary power terminations are connected in such a manner that commercial power may be restored in forty-five minutes upon request.
      b. Place temporary power cables out of the way in a safe manner that provides no hazard to personnel or equipment in the area.
      c. Provide all special connections required.
      d. Conduct all tests in presence of the representative except where advised this would not be necessary.

G. The entire installation shall be free from short circuits and improper grounds. Test shall be made in the presence of the Architect, his Engineer or his representative. Panels and circuits shall be tested for grounds and shorts with mains disconnected from the

feeder, branches connected, lamps removed or omitted from the sockets and all wall switches closed. Each individual circuit shall be tested at the panel with the equipment connected for proper operation

H. The following minimum tests are required, but shall not be limited to this list. Tests will be supervised and witnessed by the Architect/Engineer and Construction Manager:
   1. Proper phase rotation.
   2. Short circuits.
   3. Improper grounds.
   4. Power and control electrical circuits for circuit continuity and function test.

I. Furnish all personnel, labor, meters, instruments, cable, connections, equipment and apparatus necessary for making all tests.

J. Check and test all switchboards, transformers, panelboards, feeders, power and control cables, communication system devices and wiring, and all connections to all equipment.

K. After wires and cables are in place and connected to devices and equipment, the system shall be tested for short circuits, improper grounds, and other faults. If fault condition is present, the trouble shall be rectified and the wiring system shall be retested.

L. A voltage test shall be made at each lighting panel, distribution panel and at the last outlet on each circuit. If drop in potential exceeds one percent, correct the condition by locating the ground or high resistance splice or connection and retest.

M. Any wiring device, electrical apparatus, or lighting fixture grounded or shorted on any integral "live" part, shall be removed and the trouble rectified by replacing the defective parts or materials.

N. The Architect/Engineer will conduct from time to time such tests as may be required to any part of the equipment to determine if it is installed in accordance with specifications. Extend to the Architect/Engineer all facilities to this end and furnish skilled or unskilled help required.

O. All final tests shall be witnessed by the Architect/Engineer and Construction Manager and three copies of the verified test results shall be given to the Architect/Engineer and Construction Manager promptly upon completion of a test.

P. Provide assistance to the various equipment manufacturers' field engineers as required in the testing and adjusting of the electrical power and control equipment. Cooperation shall be such that a minimum of time is required for equipment testing.

Q. A log shall be maintained for all tests. This log shall be certified before completion of the project, both as to test value and date of test. All major equipment such as the

switchboard and panelboards shall be energized initially in the presence of the Architect/Engineer and Construction Manager.

R. The Owner reserves the right to operate any system or equipment prior to final completion and acceptance of the work. Such preliminary operation shall not be construed as an acceptance of any work. Each piece of equipment and all of the systems shall be adjusted to ensure proper functioning and shall be left in first class operating condition.

3.02 DRAWINGS AND COORDINATION

A. Examine Drawings and Site; be familiar with types of construction where electrical installation is involved. Work shall be neatly installed in a workmanlike manner in accordance with NECA Standard of Installation. Work shall be coordinated with other trades to avoid conflicts. Clarifications will be made by Engineer and minor adjustments shall be made without additional cost to Owner. Obtain ruling from Engineer concerning any obvious discrepancies or omissions in work before bidding. All work involved in correcting obvious errors or omissions after award of Contract shall be performed as directed by Engineer without additional cost to Owner.

B. Layouts of equipment, accessories and wiring systems are diagrammatic (not pictorial), but shall be followed as closely as possible. Drawings and Specifications are for assistance and guidance, and exact locations, distances, levels, etc., will be governed by Site.

C. All equipment (devices, conduits, boxes, etc.) shall be flush or semi-flush mounted unless otherwise noted. Where conditions do not allow flush mounting and where acceptable to the Architect, equipment may be surface mounted.

3.03 PREPARATION

A. Cooperate with the Commissioning Authority in development of the Prefunctional Checklists and Functional Test Procedures.

B. Furnish additional information requested by the Commissioning Authority.

C. Prepare a preliminary schedule for equipment start-up and testing, adjusting, and completion for use by the Commissioning Authority; update the schedule as appropriate.

D. Notify the Commissioning Authority when system testing, startup and adjusting will occur; when commissioning activities not yet performed or not yet scheduled will delay construction notify ahead of time and be proactive in seeing that the Commissioning Authority has the scheduling information needed to efficiently execute the commissioning process.

E. Put all electrical systems into operation and continue operation during each working day of testing, adjusting, and commissioning, as required.

3.04 OPERATION AND MAINTENANCE MANUALS

A. See Section 07 78 23 for additional requirements.

B. Add design intent documentation furnished by Architect to manuals prior to submission to Owner.

C. Submit manuals related to items that were commissioned to Commissioning Authority for review; make changes recommended by Commissioning Authority.

D. Commissioning Authority will add commissioning records to manuals after submission to Owner.

3.05 DEMONSTRATION AND TRAINING

A. See Section 01 79 00 for additional requirements.

B. Demonstrate operation and maintenance of electrical system to Owner' personnel; if during any demonstration, the system fails to perform in accordance with the information included in the O&M manual, stop demonstration, repair or adjust, and repeat demonstration. Demonstrations may be combined with training sessions if appropriate.

C. These demonstrations are in addition to, and not a substitute for, Prefunctional Checklists and demonstrations to the Commissioning Authority during Functional Testing.

D. Provide the services of manufacturer representatives to assist instructors where necessary.

3.06 WORKING SPACE

A. Provide adequate working space around electrical equipment in compliance with Article 4 of Electrical Safety Orders. In general, provide 36 inches minimum clear work space in front of panelboards and controls of 120/208 volt systems and 42 inches minimum for 277/480 volt systems.

3.07 CARE AND CLEANING

A. All broken, damaged or otherwise defective parts shall be repaired or replaced without additional cost to Owner. Work shall be left in a condition satisfactory to Engineer. At completion, carefully clean and adjust all equipment, fixtures and trim installed as part of this work. Systems and equipment shall be left in a satisfactory operating condition.

B. All surplus materials and debris resulting from this work shall be cleaned out and removed from site; this includes surplus excavated material.

3.08 EXCAVATING AND BACKFILLING

A. Excavate and backfill as required for installation of electrical work. Restore all surfaces, roadways, sod, walks, curbs, walls, existing underground installation, etc., cut by installations to original condition in an acceptable manner. Maintain all warning signs, barricades, flares and lanterns as required by the Safety Orders and local ordinances.

B. Excavation: Dig trenches straight and true to line and grade, with bottom clear of any rock points. Minimum conduit depth of pipe crown shall be 24 inches below finished grade.

C. Backfill: Support conduits with 2" sand bedding at bottom of trench. Provide sand backfill from bottom to 12" below finished grade. The top 12" to be local fine earth material free of rubble, rubbish or vegetation. Trenches shall be backfilled and compacted to 90% (per ASTM D1557) (95% under AC pavement and all roadways) of maximum dry density at optimum moisture content in layers not to exceed 6" when compacted.

3.09 PROTECTION

A. In performance of work, protect work from damage. Protect electrical equipment, stored and installed, from dust, water or other damage.

3.10 EQUIPMENT IDENTIFICATION

A. Panelboards, remote control switches, terminal boxes, etc., shall be properly identified with a descriptive nameplate. Nameplate shall be made of 3/32-inch laminated plastic with black background and white letters. Size of letters shall be 1/4-inch-high for equipment in device box or boxes 12" or smaller, and 1/2-inch-high for panelboard, terminal can, or larger items. Letters shall be machine engraved. Punched strip type nameplates and cardholders in any form are not acceptable. Nameplates shall be attached with oval head machine screws tapped into front panel.

B. Indicate type of equipment and equipment designation, ex. "PANEL-XXX", "MAIN SWITCHBOARD-XXX", "TRANSFORMER-XXX", "SIGNAL-XXX", "TV-XXX", "EF-1", "AC-1", etc.

C. Switchgear, Distribution Panels, and Panelboards shall be labeled with “FED FROM PANEL-XXX”, “PANEL-XXX”, “VOLTAGE”, and “AMPS”, and “X-PHASE”.

D. Label receptacles with printed plastic adhesive letters on cover plates. Labels shall indicate “PANEL-XXX” and “Circuit Number”.

3.11 RUST INHIBITOR

A. Channels, joiners, hangers, straps, clamps, brackets, caps, nuts and bolts and associated parts shall be plated electrolytically with zinc followed immediately thereafter by treating freshly deposited zinc surfaces with chromic acid to obtain a surface which will not form a white deposit on surface for an average of one hundred twenty (120) hours when subjected to a standard salt spray cabinet test, or shall be hot dipped galvanized.

3.12 EQUIPMENT PADS

A. Concrete reinforced pads for mounting of equipment (i.e. switchboard, transformers, freestanding panels, etc.) shall be minimum 3000psi, 6" thick with #4 rebars at 12" on center each way. Rebars shall be centered in pad. Pad shall extend minimum 2" beyond equipment and 1.5" above surrounding area. Backfill and compact to 95% maximum dry density at optimum moisture content in layers not to exceed 6" when compacted.

3.13 EQUIPMENT ANCHORAGE

A. Seismic Anchorage of Electrical equipment shall conform to the regulations of 2022 CBC (California Building Code) and ASCE 7-16, sections 13.3, 13.4, and 13.6. All equipment shall be braced or anchored to resist a horizontal force acting in any direction using the following criteria:
   1. The total design lateral seismic force shall be determined from section 1614A of 2022 CBC and 13.3 ASCE 7-16. Forces shall be applied in the horizontal directions which results in the most critical loading for design.
   2. The value if Ap (component Amplification factor) and Rp (component response modification factor) of section 13.3.1 ASCE 7-16 shall be selected from section 13.6-1 ASCE 7-16. The value of Ip (seismic importance factor) shall be selected from 13.1.3 ASCE 7-16.

B. Where anchorage details are not shown on the drawings, the field installation shall be subject to the approval of the structural engineer and the field representative of the Division of the State Architect.

3.14 ARC FLASH

A. Electrical equipment such as switchboards, panelboards, load centers, motor control centers, industrial control panels, meter centers shall be field marked to warn persons of potential electric arc flash hazards per CEC 110.16 and NFPA 70E Standard for Electrical Safety in the Workplace. Minimum label wording shall be as follows:

DANGER
Arc Flash and Shock Hazard.
Appropriate PPE Required.
Do not operate controls or open doors without appropriate

personal protection equipment.
Failure to comply may result in injury or death.

3.15 CLOSING OF AN UNINSPECTED WORK

A. Do not allow or cause any of work installed hereunder to be covered up or enclosed before it has been inspected and approved.

B. Should any work be enclosed or covered up before it has been approved, uncover such work and after it has been inspected and approved, make all repairs necessary to restore work of others to conditions in which it was found at time of cutting, all without additional cost to Owner.

3.16 CONDUITS

A. All conduits shall be rigid steel except where flexible or PVC is allowed per below.

B. Flexible conduit shall be used to provide flexible connections of short length (3 ft or less) to equipment subject to vibration or movement and to all motors. Provide a separate bonding conductor in all flexible connections/conduit. Flexible conduit shall be steel and one continuous length without couplings.

C. Conduits installed in contact with ground shall be PVC-40 conduit.
   1. Provide a minimum 3" of sand bedding at the bottom of the trench before laying conduits. Maintain 2" separation between conduits. Maintain 12" separation between power conduits (120 Volts and greater) and low voltage signal conduits.
   2. Risers, including elbows, shall be double-wrapped rigid steel or PVC coated rigid steel conduit; except that risers, including elbows and bends, at in-ground pull box locations shall be PVC-40 terminated with endbells.
   3. When installing underground conduits to specified depth, depth shall be taken from the top of the conduit to the finished grade level. Unless otherwise specified, underground conduits outside of foundation line shall be installed with top side not less than 24" below finished grade.
      a. Conduits 1.5" and larger inside foundation line shall be below subgrade.
      b. Conduits 1.25" and smaller inside foundation line shall be installed on the subgrade, only one conduit high. Conduits shall cross under subgrade. Secure conduit to subgrade to prevent "floating".
      c. Backfill material within foundation line shall be sand.
   4. Utility Company (electric, telephone, cable TV, etc.) conduits shall be installed per their depth and backfill requirements. Minimum depth shall be 24" below finished grade. Minimum conduit shall be PVC-40. Where the utility company allows use of a "lesser" grade conduit, i.e. DB120, PVC-40 shall be used.
   5. The minimum size of conduits outside the foundation line shall be 1", 3/4" inside the foundation line.
   6. Bends shall be wide sweeping type with minimum 24 inch radius bends.

7. Manufactured elbows are required to be used for all 22.5 and 45 degree bends, and 90 degree elbows, and combinations thereof. Field bends may be used for other bends with approved field benders specifically for such purpose and such bends shall not compromise the integrity and nominal thickness of the conduit wall.
8. For all trenches, provide a 6" wide non-biodegradable metal-detectable polyethylene tape at 12" below grade, 5-mil thick, labeled " CAUTION ELECTRIC LINE BURIED BELOW". Fluorescent red for electric power conduits and fluorescent orange "TELECOMMUNICATIONS" for telephone and signal conduits. Use Fluorescent red for common trenches. Tape shall be continuous for full length of trench.

D. Conduits for data, telecommunications, signal, video, TV, and/or containing fiber optic, coaxial, or OSP (outside plant) multi-pair cables shall have a minimum inside bend radius per CEC Table 346-10 (do not use exception); except that conduits 2" to 4" shall be minimum 24" radius bends.

E. After installation of conductors, all conduits routed below grade shall be sealed at each opening, including risers and in pull boxes, to prevent the entrance of water and debris.

F. Conduits not terminated into a box or cabinet, such as stubbed to a backboard, shall be terminated with an insulated bushing. Bushings for metallic conduits shall be metallic type secured by set screw, compression, or threaded type. Bushings for PVC conduits shall be glued in place.

G. Although circuiting is shown as diagrammatic, their point-to-point destinations and their indication of above/below ground route shall be followed as much as possible. Where site conditions dictate that an alternate means of routing will alleviate conflicts, the alternate means will be considered with prior approval by the Engineer.

H. Maintain 12 inch separation between power circuits (>120V) and all signal circuits (data, telephone, speaker, clock, etc.) to prevent interference.

I. Feeder conduits connected to panels/switchboard shall have ground lug bushing connected to equipment ground buss with ground wire same size as largest ground wire in the panel/switchboard.

J. Where conduits cross building expansion/seismic joints provide a short length of flexible conduit (do not exceed 6 ft.) and fittings listed as a grounding means, or in locations where flex conduit cannot be used provide UL listed expansion/seismic fittings.

K. Conduits shall be terminated to panels, cans, junction boxes at both ends.

L. Do not combine circuits in a conduit without engineer’s approval.

3.17 CAPPING

A. Cap conduits during construction with manufactured seals. Swab out conduits before wires are pulled in.

B. Cap all empty conduits below grade and in pull boxes with manufacturer's caps to prevent entrance of water and debris, attach pull string to cap.

3.18 CONDUCTORS

A. Splices and joints for #10 AWG or smaller wiring shall be twisted together electrically and mechanically strong and insulated with approved type insulated electrical spring connectors, Scotchlok or Ideal. Joints and connections for #8 AWG or larger shall be made with Burndy, T & B, or approved equal, solderless tool applied pressure lugs and connectors. Uninsulated lugs and wire ends shall be insulated with layers of plastic tape equal to insulation of wire and with all irregular surfaces properly padded with "Scotchfil" putty prior to application of tape. Tape shall be equal to Scotch #33, General Electric #AW-1, or approved equal. Feeder splicing is not permitted.
   1. In special instances where feeder splicing is allowed by the Engineer, it shall be made with high compression sleeve type connector followed by manufactured splicing kit utilizing as insulators, resins poured into a ready-to-use plastic mold to provide a uniform, moisture-proof tough, impact-resistant insulation.
   2. Conductor splices below grade shall meet ANSI C119.1-1986 and UL 486D Standards. Raychem WCSM or FCSM heavy wall heat shrink tubing; or RVS or RVC series if use of flame heat is prohibited. Conductors to be joined with compression sleeve connectors.
   3. Fire alarm and intercom may not be spliced and shall be in appropriate conduit
   4. Polaris tap connectors not allowed

B. Use only UL approved wire pulling compound as lubricant.

C. Lace conductors together with waxed linen lacing cord, T & B "Ty-Rap", Holub "Quik-Wrap" or equal, in a neat and workmanlike manner in panelboards, wireways, raceways, pull boxes and similar locations.

D. #12 AWG wire shall be the minimum size wire used for power circuits.

E. #10 AWG wire shall be the minimum size wire used for lighting circuits.

F. Provide cable supports in risers by means of a clamping device with insulated wedges or "Kellem" grips.

G. All conductors shall be in conduit unless otherwise indicated.

H. Conduit sizes shall be based on code fill table for THHN insulated wires to accommodate the number, size, and type of wires shown or specified.

I. Wiring installed in pull boxes or junction boxes, where wire is pulled through without terminations (except splices), shall have a service loop around the interior of the box for 360 degrees utilizing the largest circumference.

J. Use #10 AWG conductor for 20 Amp 120 Volt circuit home runs longer than 75 feet, and for 20 Amp 277 Volt circuit homeruns longer than 200 feet.

K. Where conductors are increased in size and number (such as for voltage drop reasons), such that conductors will not fit the standard breaker or panel lugs, terminate conductors in one of the following means:
   1. Provide larger breaker frame or panelboard.
   2. Provide oversized lugs.
   3. Last option only with approval from Engineer: Terminate wires in multiport connector and provide pigtail. Splice to be made in panel or switchboard if space is available, or in separate splice box. This option will not be normally granted.

3.19 GROUNDING

A. Grounding and ground bonding of the electrical installation shall be in accordance with CEC Article 250, and any applicable codes. Ground fittings shall be approved manufactured type, installed and connected to conform with Code requirements.

B. Neutral conductors and noncurrent-carrying parts of equipment at each installation shall be grounded in accordance with applicable code. Ground conductor shall be copper having a current capacity sized in accordance with CEC.

C. All equipment cases, motor frames, etc., shall be completely grounded to satisfy requirements of CEC. Install bond wire in flexible conduit. Install copper bond wire, sized in accordance with CEC, in all nonmetallic raceways and bond to all metallic parts using approved fittings.

D. Service ground conductor shall be connected to a "Ufer" encased ground

E. Total ground resistance shall not exceed 25 ohms.

F. All connections shall be made with solderless connectors or molded fusion-welding process.

G. Equipment grounding conductors shall be insulated with a continuous green outer finish along its entire length. Conductors size #4 AWG and larger may be identified (with green electrical tape applied half-lapped) at each end and at every point where the conductor is accessible. Tape shall be applied from its point of entry to point of exit or termination.

H. Insulated grounded (neutral) conductors shall be identified with a continuous white outer finish along its entire length. Neutral conductors #4 AWG or larger can be

identified by a distinctive white marking (applied half-lapped with white electrical tape) for the last 12 inches at each end.

3.20 VISUAL INSPECTIONS

A. Prior to Manual Operation and Electrical Testing, perform Visual Inspections to verify the following:

B. The equipment is completely and properly installed.

C. The equipment is free from damage and defects.

D. Shipping blocks and restraints have been removed.

E. Electrical terminations have been properly tightened.

F. The equipment has been properly aligned.

G. The equipment has been properly lubricated.

H. The ventilation louvers are open and unobstructed.

I. Voltages and phases have been properly identified.

J. Terminations in control panels have been properly identified.

K. The equipment is ready to be tested

3.21 MANUAL OPERATION

A. Prior to any Electrical Testing, mechanical devices shall be exercised or rotated manually to verify that they operate properly and freely.

3.22 INSPECTING AND TESTING - GENERAL

A. Submit startup plans, startup reports, and Prefunctional Checklists for each item of equipment or other assembly to be commissioned.

B. Perform the Functional Tests directed by the Commissioning Authority for each item of equipment or other assembly to be commissioned.

C. Provide two-way radios for use during the testing.

3.23 FIELD TESTS

A. General: Perform field test in the presence of the Owner's Representative except as otherwise specified. Provide required labor, materials, equipment and connections to

perform tests. Document results and submit them to the Owner's Representative. Repair or replace all defective work.

B. Perform Insulation Resistance (IR) "Megger" Testing per NETA Standards. Submit test results. Provide testing for:
   1. All feeders 100 Amps and higher.
   2. Branch circuits 100 Amps and higher.
   3. Provide test results for all “Megger” tests.

C. Verify operation of starters and install overload protection devices sized in accordance with the motor full load current.

D. Each ground rod shall be tested. A ground rod which does not have a resistance to ground of 25 ohms or less shall be augmented by one additional ground rod at no less than 8 feet from each other.

3.24 ELECTRICAL TESTS BY CONTRACTOR

A. Switchboard

1. The Contractor shall perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification, Sections 7.1, 7.6, 7.9, 7.10, 7.11, and 7.14, as appropriate. Certify compliance with test parameters.

2. Switchboard and completed installation shall be inspected for adequate size, bus spacing, bracing, physical damage, proper alignment, anchorage and grounding.

3. Switchboard frame will be inspected for alignment, level, and anchorage.

4. Check tightness of accessible bolted bus joints using calibrated torque wrench per manufacturer’s recommended torque value. All bus bolts will be torqued to their proper value. A mark to be placed on each tightened bolt to ensure completeness.

5. Switchboard interior will be vacuumed and wiped clean.

6. The following tests and checks shall be performed before placing in operation:

   a. Check all new bus and cable connections for proper contact pressure and mark each bolt with a red “dot” of paint to indicate it has been checked.

   b. Check all the new equipment for mechanical adjustment, lubrication, and freedom of operation. Remove all shipping blocks.

   c. Operate and test trip units for all new breakers.

d. Test all transfer switches and associated control circuits for correct connection and operation.

e. Test all panel feeders and main breakers.

f. Test ground fault systems by operating push-to-test button.

g. Physically test key interlock systems to check for proper functionality.

7. Using a Megger, measure the insulation resistance of each bus section phase-to-phase and phase-to-ground for one minute each, at minimum test voltage of 1000VDC. Minimum acceptable value for insulation resistance is one (1) megohm. Refer to manufacturer's literature for specific testing procedure.

B. Molded Case Circuit Breakers rated less than 100A

1. Circuit breakers will be operated manually several times to ensure smooth operation.

2. Molded case will be inspected for cracks.

3. Rated current will be passed through each phase and millivolt readings taken across contacts.

4. Time current characteristic tests will be performed by passing 300% rated current through each phase and monitoring trip time.

5. Instantaneous pickup current will be determined by finding the current level at which the breaker trips out in less than 2 cycles.

6. Insulation resistance tests will be performed at 1000 Volts DC.

7. Circuit breaker covers will be removed on unsealed units and checked for cracks. Interphase barriers and arc chutes to be inspected. All bolts and lugs will be tightened. All internal auxiliary devices will be inspected.

8. Contacts, shunts, etc., will be visually inspected for wear and alignment.

9. Inverse trip time, instantaneous pickup current and millivolt drop across contacts, insulation resistance values, as well as deficiencies causing breaker to function outside published limits will be recorded. Times will then be compared with manufacturer's or NEMA published values.

C. Disconnect Switches

1. Check for cleanliness of contacts, operation, etc.

2. Lubricate contacts and mechanical devices.

3. Check fuse-clip tightness.

4. Perform a 1,000-volt megger test on disconnect switches rated for 600V and at 500 volts for disconnect switches rated for 240V.

D. Lighting

1. Upon completion of installation of lighting fixtures, apply electrical energy to demonstrate capability and compliance with requirements. The Contractor shall replace at his expense all noisy ballasts, broken or cracked lenses or other defective items. Where possible, correct malfunctioning units at site, then re-test to demonstrate compliance; otherwise, remove and replace with new units, and proceed with re-testing.

2. Give advance notice of dates and times for field tests.

3. Provide instruments to make and record test results.

4. Tests and Observations

a. Verify normal operation of lighting units after installing fixtures and energizing circuits with normal power source.

b. Check for excessively noisy ballasts.

3.25 INDEPENDENT AGENCY TESTING

A. Circuit Breakers rated 100A or greater

1. All circuit breakers, 100 amps or more, shall be tested by an independent testing agency in accordance with NETA specifications and a report submitted to the architect. Any circuit breaker that does not pass the test shall be replaced.
2. Circuit breakers will be operated manually several times to ensure smooth operation.
3. Molded case will be inspected for cracks.
4. Rated current will be passed through each phase and millivolt readings taken across contacts.
5. Time current characteristic tests will be performed by passing 300% rated current through each phase and monitoring trip time.
6. Instantaneous pickup current will be determined by finding the current level at which the breaker trips out in less than 2 cycles.
7. Insulation resistance tests will be performed at 1000 Volts DC.
8. Circuit breaker covers will be removed on unsealed units and checked for cracks. Interphase barriers and arc chutes to be inspected. All bolts and lugs will be tightened. All internal auxiliary devices will be inspected.
9. Contacts, shunts, etc., will be visually inspected for wear and alignment.
10. Inverse trip time, instantaneous pickup current and millivolt drop across contacts, insulation resistance values, as well as deficiencies causing breaker to function outside published limits will be recorded. Times will then be compared with manufacturer's or NEMA published values.
11. The testing agency shall provide calibration labels for all relays and circuit breakers tested. Labels shall be self-adhesive and placed on covers or frames so

as not to obscure nameplate, tap block or time dial. Label shall indicate date tested and firm name.

B. Grounding System
1. Test shall be performed for every new **SEPARATELLY DERIVED AC SYSTEM.**
2. Ground tests shall meet the requirements of the California Electrical Code and comply with UL 467. The grounding electrode system at the main electrical service equipment shall be tested by an Independent Testing Agency in accordance with the three-point fall of potential method as specified in IEEE Standard 81-1983. Maximum ground resistance shall be 5 OHMS. A copy of the test report shall be submitted to the architect and engineer of record.
3. Maximum grounding to resistance values are as follows:
   a. Equipment Rated 500 kVA and Less: 5 ohms.
   b. Equipment Rated 500 to 1000 kVA: 5 ohms.
   c. Equipment Rated More than 1000 kVA: 3 ohms.
4. Tests: Subject the completed grounding system to a megger test at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Measure ground resistance not less than 2 full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by the 2-point method according to IEEE 81.
5. The test agency shall remove the test link between the ground and neutral, and test the neutral for any parallel and/or superfluous ground paths. If any are found, a report should be given to the Engineer. No grounds are to be removed unless authorized in writing.
6. Ground electrode resistance shall be taken using a Biddle ground resistance meter and readings given to the report.
7. All ground connections in switchboard shall be check for tightness and adequacy.
8. Measure the resistance to ground of each ground rod [in a ground mat] before connection to the other ground rods. The resistance shall not exceed 10 ohms.
9. Measure the resistance to ground of the total ground system with all connections completed. The resistance shall not exceed 2 ohms for primary services or 5 ohms for secondary services.
10. Tests of the resistance to ground shall be made using either the three point method or the fall-of-potential method.
11. Perform a continuity check from equipment ground bus bars and ground lugs to the ground system.
12. Ground rods for manholes and light poles need not be tested.
13. Excessive Ground Resistance: Where resistance to ground exceeds specified values, notify Owner promptly and include recommendations to reduce ground resistance and to accomplish recommended work.
14. Report: Prepare test reports, certified by the testing organization, of ground resistance at each test location. Include observations of weather and other

phenomena that may affect test results. Describe measures taken to improve test results.

C. Panels
1. The Independent Testing Agency shall perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification, Sections 7.1, 7.6, 7.9, 7.10, 7.11, and 7.14, as appropriate. Certify compliance with test parameters.
2. After Substantial Completion, but not more than 2 months after Final Acceptance, The Independent Testing Agency shall perform an infrared scan of each switchboard and panel.
   a. Remove fronts to make joints and connections accessible to a portable scanner.
   b. Use an approved infrared-scanning device designed to measure temperature or detect significant deviations from normal values.
   c. Provide calibration record for device used.
   d. Prepare a certified report identifying switchboards and panels checked and describing results of infrared scanning. Include notation of deficiencies detected, remedial action taken and observations after remedial action.

D. Power Cable
1. The 600-volt insulated wires and cables shall be factory tested prior to shipment in accordance with ICEA Standards for the insulation specified.
2. Perform a continuity check and a 1,000-volt DC megger test on 600-volt power cables No. 6 AWG and larger as outlined in latest version NETA Acceptance Testing Specifications.
3. Phase conductors, if shorted, grounded or at fault shall be removed, shall be replaced and the wiring system shall be retested.

3.26 FUNCTIONAL TESTING

A. All automatic and manual functions shall be checked for proper operation.

B. All indicating circuits, lights and alarms shall be tested for correct operation. Burned out indicators shall be re-lamped.

C. Upon completion of the Work, place the entire installation in operation, test for proper function, and show systems and equipment to be free of defects.

3.27 CIRCUIT BREAKER COORDINATION

A. Provide protective device (fuses and breakers) coordination study on the distribution system to determine circuit breaker settings for electronic breakers and other breakers with adjustable tripping characteristics, and all protective devices 300 amps or more. The coordination shall be with the immediate downstream and upstream protective device(s).

B. Plot time-current characteristics of the specified protective devices using log-log paper. Include the following minimum information, as pertinent to system, on plots:
   1. Complete titles.
   2. Representation One Line Diagram and legends.
   3. Power company's relays or fuse characteristics.
   4. Complete operating bands of low voltage circuit breaker trip curves.
   5. Fuse curves.
   6. Protective relay type selected and curves.
      Maintain reasonable coordination intervals and separation of characteristic curves on plots. Provide sufficient curves to clearly indicate the coordination achieved to the main breaker, feeder breakers and load protective devices rated 300 amperes or more.

C. Summarize the results of the power system study in a bound final report. Organize the report using the following sections:
   1. Description, purpose, basis, written scope, and a single-line diagram of the portion of the power system which is included within the scope of study.
   2. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip settings, fuse selection, and commentary regarding same.
   3. Provide a separate tabulated list for the selection and settings of the protective devices. Include the following minimum information:
      a. Circuit identification.
      b. IEEE device number.(Where applicable)
      c. Manufacturer, device type and range of adjustment.
      d. Recommended settings.

3.28 GROUND FAULT PROTECTION AND TESTING

A. Where indicated on the plans, provide circuit breaker with ground fault protection. The ground fault system shall include a memory circuit for positive tripping action despite intermittent arcing ground faults.

B. Provide an integral means of testing the ground fault system to meet the on-site requirements of CEC Articles 230 and 517.

C. Provide acceptance testing per International Electrical Testing Association Inc. (NETA) specifications and standards. Submit test results.

3.29 CLEANING

A. Brush and clean work prior to concealing, painting and acceptance. Performed in stages if directed.

B. Clean and repair soiled or damaged painted exposed work and match adjoining work before final acceptance.

C. Remove debris from inside and outside of material, equipment and structures.

3.30 WARRANTY

A. All materials and installation shall be provided with a one (1) year warranty which shall include replacement parts, labor, retesting, and travel to and from the job site. The warranty period shall begin after final acceptance of the project.

3.31 ENERGY CODE COMPLIANCE

A. All energy code compliance forms and testing for site lighting shall be completed as part of the Increment 2 submittal.

END OF SECTION

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Wires, cables and connectors.
   2. Identification.

1.02 SYSTEM DESCRIPTION

A. Electrical Connections: Connect equipment, whether furnished by Owner or other Divisions of the Contract, electrically complete.

1.03 SUBMITTALS

A. Provide shop drawings, product data and product selection for the following:
   1. Wires, cables and connectors.
   2. Identification equipment.
   3. Submit only one manufacturer per product.

1.04 REGULATORY REQUIREMENTS

A. Conform to requirements of the CEC, latest adopted version with amendments by local AHJs.

B. Furnish products listed by UL or other testing firm acceptable to AHJ.

1.05 SPLICES

A. Make Connections, splices, taps and joints mechanically and electrically secure. Protect exposed wires and connecting devices with electrical tape or insulation to provide protection not less than that of the conductor.
   1. Splices of #10 and smaller, including fixture tape, shall be made with Scotchlok connectors, T & B “Piggys” or equal.
   2. Splices of #8 through #4 shall be split bolt service connectors “Kerneys”, T & B “Lock Tites” or equal, insulated with Scotch #88 or Okeweld four-purpose tape.
   3. Splices #2 and larger shall be OZ “ST” Series insulated with Scotch fill and Scotch #88 or Okeweld.
   4. Splices in underground pull boxes shall be Scotchcast, cast resin splices.
   5. Wire splice devices shall be sized according to manufacturer’s recommendations.
   6. Fire Alarm and Intercom shall not be spliced.

1.06 CONDUCTORS IN PANELS

A. Conductors in panels, motor control centers, etc. shall be laced with T & B Ty-raps.

B. All current carrying conductors in panels shall be labeled.

1.07 LUBRICANT

A. Lubricant for conductor installation shall be powdered soapstone, Y-er, Minerallac “Pull-In” compound or other U.L. approved lubricant. Flax soap is not approved and not permitted on the job.

PART 2 - PRODUCTS

2.01 WIRES AND CABLES

A. Copper, 600 volt rated throughout. Branch circuit conductors shall be stranded. Phase color to be consistent at all feeder terminations; A-B-C, top to bottom, left to right, front to back. Conductors 3AWG and larger, minimum insulation rating of 75C. Insulation types THWN or THHN. Minimum insulation rating of 90C for branch circuits. Color code conductors as follows:

PHASE	208 VOLT WYE
A	Black
B	Red
C	Blue
Neutral	White
Ground	Green
Isolated Ground	Green w/yellow trace

B. SO Cable: Annealed copper conductors, 600 volt rated. Minimum Size No. 12, with ground wire. Maximum of six conductors and ground per cable. 90C rated thermoset jacket.

C. Refer to signal and communications Specification Sections for cable requirements.

D. Conductors shall be as manufactured by Anaconda, General Electric, Rome Cable Co. or approved equal.

E. Deliver to site in unbroken packages, plainly marked with the manufacturer’s name, date of manufacture (not more than six months old), and voltage size and classification number.

2.02 ELECTRICAL IDENTIFICATION

A. Engraved Labels: Melamine plastic laminate, white with black core, 1/16 inch thick, manufactured by Lamicoid. Engravers standard letter style, minimum 3/16-inch high letters, all capitals. Drill or punch labels for mechanical fastening except where adhesive mounting is necessary because of substrate. Use self-tapping stainless steel screws.

B. Conductor Numbers: Manufacturers standard vinyl-cloth self-adhesive cable and conductor markers of the wraparound type. Preprinted black numbers on yellow field. Manufacturers: Thomas and Betts Corp., or approved equal.

C. Branch Circuit Panel Schedules: Provide branch circuit identification schedules, typewritten, clearly filled out, to identify load connected to each circuit and location of load. Numbers to correspond to numbers assigned to each circuit breaker pole position.

D. Relay Panel Schedule: Provide typewritten schedule to identify the incoming circuit, the controlled load, and the controlling devices for each relay.

E. Underground Utilities Markers: Inert polyethylene plastic ribbon, 6 inches wide by 4 mil thick. Safety Red for electric power distribution. Safety Alert Orange for telephone, signal, data and cable TV. Imprint over entire length of ribbon in permanent black letters, the system description, selected from manufacturer's standard legend which most accurately identifies the subgrade system. Manufacturers: Thomas and Betts Corp., or approved equal.

F. Circuit Breaker Identification: Provide permanent identification number in or on panelboard dead-front adjacent to each circuit breaker pole position.

PART 3 - EXECUTION

3.01 ELECTRICAL CHARACTERISTICS

A. Verify electrical characteristics of equipment prior to installation of conduits and wiring for equipment.

3.02 MOTOR BRANCH CIRCUIT WIRING

A. Do not install electrical equipment or wiring on mechanical equipment without approval of Architect.

B. Connect motor branch circuits complete from panel to motor as required by code and manner herein described.

C. Motor starter, control devices and control wiring provided by other Divisions unless noted on Drawings.

3.03 APPLIANCE/UTILIZATION EQUIPMENT

A. Provide appropriate cable and cord cap for final connection unless equipment is provided with same. Verify special purpose outlet NEMA configuration and ampere rating with equipment supplier prior to ordering devices and coverplates.

3.04 INSTALLATION

A. Conduit:
1. Conduit Joints: Assemble conduits continuous and secure to boxes, panels, luminaires and equipment with fittings to maintain continuity. Provide watertight joints where embedded in concrete, below grade or in damp locations. Seal PVC conduit joints with solvent cement and metal conduit with metal thread primer. All rigid conduit connections to be threaded, clean and tight (metal to metal).
2. Conduit Placement:
   a. Install continuous conduit and raceways for electrical power wiring and signal systems wiring. Conduit runs shall be mechanically and electrically continuous from origination to termination.
   b. All thread (running thread) shall not be used as a raceway.
3. Below Grade Conduit and Cables: Place a minimum 3-inch cover of sand or clean earth fill around the cable or conduit on a leveled trench bottom. Lay conduit on a smooth level trench bottom, so that contact is made for its entire length. Remove water from trench before electrical conduit is installed. Conduit stubs from underground shall be capped with a coupling, nipple, coupling and manufactured plug until use. Conduits shall be capped during construction.
4. Maximum Bends: Install code sized pull boxes to limit sum of bends in a run of conduit to 270 degrees.
5. Flexible Conduit: Install 12-inch minimum slack loop on flexible metallic conduit and PVC coated flexible metallic conduit. Minimum trade size: one half inch (1/2”)
6. Conduit Size: Size as indicated on Drawings. Where size is not indicated, provide conduit in minimum code permitted size for THW conductors of quantity required for complete operation. Minimum trade size 3/4 inch.
7. Fire Alarm Conduit: All fire alarm system wiring shall be in conduit, 3/4 inch minimum.
8. Provide pull cord in all empty conduits that exceed 10 feet in length or the total sum of bends exceed 90 degree radius. Pull wires shall be #12 TW in conduits 1 inch and smaller and 3/16 inch polypropylene rope in conduits 1 1/4 inch and larger.
9. Conduit Use Locations:
   a. Underground: PVC.
   b. Wet Locations, and Subject to Mechanical Damage: GRC.
   c. Damp Locations and Locations Exposed to Rain: GRC only.

d. Cast-In-Place Concrete and Masonry: GRC and PVC. Horizontal runs of conduit in poured-in-place concrete slabs, maximum diameter of conduit is 1.25 inches.
e. Dry, Protected: GRC, EMT.
f. Sharp Bends and Elbows: GRC, EMT use factory elbows.
g. Install pull wire or nylon cord in empty raceways provided for other systems. Secure wire or cord at each end.
h. Elbow for Low Energy Signal Systems: Use long radius factory ells where linking sections of raceway for installation of signal cable.
i. Motors, recessed luminaires and equipment connections subject to movement or vibration, use flexible metallic conduit.
j. Motors and equipment connections subject to movement or vibration and subjected to any of the following conditions; exterior location, moist or humid atmosphere, water spray, oil or grease use PVC coated liquid tight flexible metallic conduit.

10. Branch Circuits: Do not change the intent of the branch circuits or controls without approval. Homeruns for 20 amp branch circuits may be combined to a maximum of six current carrying conductors in a homerun. Apply de-rating factors as required by CEC. Increase conductor size as needed.
11. Feeders: Do not combine or change feeder runs.
12. Unless otherwise indicated, provide raceway systems for lighting, power and Class 1 remote-control and signaling circuits and Class 2 and 3 remote-control signaling and communication circuits.

B. Conduit Fittings:
1. Use compression fittings in dry locations, damp and rain-exposed locations. Maximum size permitted in damp locations and locations exposed to rain is 2 inches in diameter.
2. Use threaded type fittings in wet locations, and damp or rain-exposed locations where conduit size is greater than 2 inches.
3. Use PVC coated rigid steel conduit ells for underground power and telephone service entrance conduits to each building. Use 36-inch radius ells for power service conduits and 48-inch radius ells for telephone service conduits make adjustments in trenching accordingly.
4. Telephone and signal conduit bends where required shall have a radius of ten times the conduit trade size, unless otherwise noted.
5. Underground conduit bends shall have a minimum radius of 12 times the conduit trade size, unless otherwise noted.
6. Use insulated type bushings with ground provision at switchboards, panelboards, safety disconnect switches, junction boxes and the like that have feeders 60 amperes and greater.
7. Provide bushing or EMT connector for conduits that do not terminate in box, enclosure, or the like.
8. Conduits shall be capped during construction with manufactured plugs until use. Electrical tape is not acceptable for this use.

a. Provide conduit expansion fittings at building expansion joints and at locations where conduit is exposed to thermal expansion and contraction. Where expansion joints are required over 1" trade size, an expansion fitting shall be used (flexible conduit may not be used). Expansion joints 1" and under may be flexible conduit

9. Condulets and Conduit Bodies: Do not use condulets and conduit bodies in conduits for signal wiring or in feeders 100 amp and larger.

C. Conductors, Wires and Cables:
1. Conductor Installation: Install conductors in raceways having adequate, code size cross-sectional area for wires indicated. Install conductors with care to avoid damage to insulation. Do not apply greater tension on conductors than recommended by manufacturer during installation. Use of pulling compounds is permitted. Clean residue from exposed conductors and raceway entrances after conductor installation. Do not use pulling compounds for installation of conductors connected to GFI circuit breakers or GFI receptacles.
2. Conductor Size and Quantity: Install no conductors smaller than 12AWG unless otherwise shown. Provide all required conductors for a fully operable system.
3. Provide dedicated neutrals (one neutral conductor for each phase conductor) in the following single phase circuits:
a. Dimmer controlled circuits.
b. Isolated ground circuits.
c. Ground fault protected circuits where a GFI breaker is used in a panelboard.
d. Other electronic equipment which produces a high level of harmonic distortion including but not limited to computers, printers, plotters, copy machines, fax machines.
e. There shall be no reduction of the neutral Capacity
4. Conductors in Cabinets: Hold conductors away from sharp metal edges. Cable and tree all wires in panels and cabinets for power and control. Use plastic ties in panels and cabinets. Tie and bundle feeder conductors in wireways of panelboards.
5. Exposed cable is not allowed.

D. Connectors: Retighten lugs and connectors for conductors to equipment prior to Substantial Completion.

E. Electrical Identification:
1. Graphics: Coordinate names, abbreviations and designations used on Drawings with equipment labels.
2. Underground Utilities Markers: Install continuous tape, 6 to 8 inches below finish grade, for each exterior underground raceway.
3. Conductor Identification: Apply markers on each conductor for power, control, signaling and communications circuits.

4. Install an engraved label on each major unit of electrical equipment, including but not limited to the following items: Disconnect switches, relays, override switches, service disconnects, distribution switches, branch circuit panelboards, and central or master unit of each electrical system including communication/signal systems.
5. Install engraved labels on the inside of flush panels, visible when door is opened. Install label on outside of surface panel.
6. Install signs at locations detailed or, where not otherwise indicated, at location for best convenience of viewing without interference with operation and maintenance of equipment.
7. On the back of receptacle and switch finish plates legibly write with indelible ink pen the circuit that each device is connected to.
8. On the front of receptacle and switch finish plates provide label with the circuit that each device is connected to. Label is self-adhesive type with black letters and clear background, 18 point lettering size.
9. Non-ferrous identifying tags or pressure sensitive labels shall be securely fastened to all cables, feeders, and power circuits in pull boxes and manholes. Tags or labels shall be stamped or printed to correspond with markings on drawings or marked so that feeder or cable may be readily identified.
10. Identify each branch circuit with wire markers. This is inclusive of wires terminated or spliced in switches, receptacles, disconnects, panelboards, switchgear, junction boxes and any other devices in which wires are terminated or spliced.
11. Junction Boxes: Provide identification labels with panel origination and circuit numbers on all junction box and enclosure covers. Four square box covers hidden above the ceiling may be marked with indelible ink marker instead of using printed labels.

F. Equipment Identification:
   1. Nameplates shall be installed on electrical equipment. Equipment to be labeled shall include the following:
      a. Individual enclosures such as disconnect switches, time switches, pushbuttons, contractors, relays, motor starters, etc.
      b. Group mounted equipment such as panelboards, switchboards, and motor control devices.
      c. Individual circuit breakers of switchboards.
   2. Each panel shall be labeled to provide the following information as a minimum:
      a. Panel name.
      b. Size of feeder feeding the panel.
      c. Rated voltage, amps and phases.
      d. Panel feeder origination
   3. Each main service switchboard and distribution panel shall be labeled to provide the following information as a minimum:
      a. Rated voltage, amps and phases.
      b. Main switch rating.

c. Feeder circuit breaker rating with name of panel or equipment fed and size of feeder to this equipment.
d. Panel feeder origination.

4. Nameplate material shall be laminated phenolic plastic, black front and back with white core. Engraving shall be through the outer layer. Embossed plastic pressure sensitive labels are not acceptable.
5. In lieu of plastic plates, device plates shall be engraved directly with lettering filled with black enamel.
6. Nameplates shall be securely fastened to the equipment with #4 Phillips round cadmium plated steel self-tapping screws, brass bolt, or with a plastic resin adhesive glue, Goodyear "Phiebond" or equal.
7. Nameplates shall adequately describe the item and its function or use of the particular equipment involved.

G. Building Seismic Joints:
1. Conduit Crossing Building Seismic Joints or covered: Provide box on either side of joint and flexible conduit between the box. Provide for a minimum of 12 inches of movement at the seismic joint. Rigid conduit crossings at seismic joints are not acceptable.

3.05 FIELD QUALITY CONTROL

A. Wiring Device Tests: Test wiring devices to ensure electrical continuity of grounding connections, and after energizing circuitry, to demonstrate compliance with requirements. Test receptacles for line to neutral, line to ground and neutral to ground faults. Correct any defective wiring.

B. Feeder Tests:
1. Test conductor insulation on feeders of 100 amp and greater for conformity with +1000 volt megohmeter. Use Insulated Cable Engineers Association testing procedures. Minimum insulation resistance acceptable is 1 megohm for systems 600 volts and below. Notify Architect if insulation resistance is less than 1 megohm.
2. Test Report: Prepare a typed tabular report indicating the testing instrument, the feeder tested, amperage rating of the feeder, insulation type, voltage, the approximate length of the feeder, conduit type, and the measured resistance of the megohmeter test. Submit report with operating and maintenance manual.

END OF SECTION

SECTION 26 05 33 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Raceways.
   2. Outlet boxes.
   3. Devices and plates.
   4. Safety disconnect switches.
   5. Surface raceway system.

1.02 SYSTEM DESCRIPTION

A. Provide raceways, wires, cables, connector, boxes, devices, finish plates and the like for a complete and operational electrical system.

B. Supporting Devices: Safety factor of 4 required for every fastening device or support for electrical equipment installed. Support to withstand four times weight of equipment it supports. Bracing to comply with Seismic Zone 4 requirements.

1.03 SUBMITTALS

A. Provide shop drawings, product data and product selection for the following:
   1. Raceways.
   2. Outlet boxes.
   3. Devices and plates.
   4. Safety disconnect switches.
   5. Surface raceway system.

B. Provide the following operating and maintenance instructions from the manufacturer for project closeout, see project closeout requirements in Division 1:
   1. Devices and plates.
   2. Safety disconnect switches.

PART 2 - PRODUCTS

2.01 RACEWAYS

A. Conduits:
   1. Galvanized Rigid Steel Conduit (GRC):
      a. Hot-dip galvanized after thread cutting. Manufacture in conformance with Federal Specification WWC-581 and ANSI C80.1.

b. ¾" Minimum size.
c. Standard weight, zinc coated on outside by hot dipping or sherardized process, with either zinc coating or other approved corrosion resistant coating on the inside.
d. Fitting shall be threaded and finished similar to conduit. Threadless fittings shall not be used. Condulets and unilets shall be **malleable** iron.
e. Conduits connected to boxes and cabinets shall be fitted with two locknuts and insulated bushing, OA "A" Series, indoors only.
f. Conduits not connected with locknuts and bushings shall be fitted with grounding bushing, OZ "BL" Series; U. L. approved and bonded.
g. Conduit stubs underground shall be capped with coupling, nipple, coupling and plug.
h. Conduits connected to boxes, cabinets, etc., outdoors, exposed to weather or in areas subject to excessive moisture shall be fitted with watertight sealing hubs of steel or malleable iron with sealing ring and insulated throat. Manufacturer to be Appleton Electric Co., or equal.
i. Conduits in contact with the ground must be wrapped with corrosion resistant tape of 10 mil or equiv.
j. Erickson Couplings (three piece threaded coupling) may be used in limited locations, where standard threaded couplings can not be used.
k. All Thread (Running Thread) shall not be used as a Raceway
l. All conduits shall be bonded per CEC
m. Conduit runs shall be mechanically and electrically continuous from outlet to outlet, box to box or panel to panel. Conduit size should provide a maximum of 40% fill ratio for the relative cable runs.
n. Conduits shall be concealed in walls, ceilings or below grade where possible. Exposed conduit shall be run parallel to room surfaces.

2. Intermediate Metal Conduit (IMC): Not permitted on this project.
3. Electrical Metallic Tubing (EMT): Not permitted on this project.
4. Flexible Steel Conduit: Reduced wall flexible steel conduit. Hot-dip galvanized. Manufacture in conformance with Federal Specification A-A-55810.
   a. Type: Continuous, flexible interlocked galvanized inside and out, shall have smooth internal wiring channel.
   b. Provide connectors with insulating bushings
   c. Minimum size permitted ½" trade size.
   d. Uses Permitted:
      1) Final Connections to mechanical equipment, not to exceed 36".
      2) Final connections to recessed lighting, not to exceed 72".
5. Liquid Tight Flexible Metallic Conduit
   a. Same as flexible steel conduit except with heavy watertight plastic jacket.
   b. Minimum size permitted one half (1/2") trade size.
   c. Uses Permitted: In Outdoor/wet/damp locations for the final connections to mechanical equipment.
   d. Shall be used to connect portable / modular buildings between rigid stub up and building.
6. Electric Nonmetallic flexible conduit may not be used.

7. Liquid Tight Non-metallic flexible conduit may not be used.
8. Flexible Conduit, PVC Coated: Hot-dip galvanized steel. PVC chemical resistant jacket extruded to core, up to 1-inch trade size. PVC chemical resistant jacket, tubed over core, up to 4-inch trade size.
9. PVC: Class 40 heavy wall rigid PVC. Rated for use with 90C conductors. Manufacture in conformance with Federal Specification WC1094A and NEMA TC-2.
    a. Minimum size permitted one half (3/4") trade size.
    b. Joints shall be solvent cemented in accordance with the recommendations of the manufacturer.
    c. All portions shall be below grade, (minimum of 24 inches).
    d. Not suitable for conduit stub for future extension.
    e. A copper-bonding conductor shall be pulled in each power raceway and bonded to equipment at each end with approved lugs.
    f. Continuation of run into the building interior shall be with rigid steel, including elbow or bend.
    g. Connection to steel conduit shall be made with approved threaded adapters.
10. AC and MC cable is not permitted on this project.
11. Wireways and Auxiliary Gutters
    a. Shall be painted steel or galvanized steel.
    b. Shall be the size and/or shape as indicated on the drawings and shall be sized in accordance with reference codes.
    c. Wire Retainers not less than 12" on centers.
    d. Shall be bonded with listed fitting or at each section of wireway.

B. Surface Receptacle/Signal Raceway Systems:
1. Two-Channel Surface Raceway: One channel for power, the other channel for signal. Provide 20 amp multi-circuit as indicated on Drawings. Provide divider between channels. Hubble 400 series, Wiremold 4000 Series, or approved. Raceway shall be metallic.
2. Provide lengths taken from Drawings to a tolerance of 1/2 inch over raceway length between end wall surface. Do not scale from Division 16 Drawings.
3. Provide prewired receptacles every 36 inches unless otherwise noted on Drawings.
4. Provide endcaps, corner joints, tees, transition fittings and hardware for a complete installation.
5. Verify exact mounting height with Drawings.
6. Finish: Shall be of same color of wall or surface it is applied to.

C. Conduit Fittings:
1. Bushings: Malleable iron with plastic insulator lining, 150C rated.
2. Ground Bushings: Malleable iron with plastic insulating liner and aluminum grounding lug rated for copper or aluminum conductor, 150C rated.
3. Rigid Steel Conduit Ells: PVC coated or painted with No. 51 bitumastic material, long radius ells, and minimum radius of 36 inches.

4. Expansion/Deflection Fittings:
   a. GRC: Use O-Z Gedney Type AX, DX and AXDX.

2.02 CONNECTORS

A. Copper Pads: Drilled and tapped for multiple conductor terminals.

B. Lugs: Indent/compression type for use with stranded branch circuit or control conductors. Manufacturers: Anderson, Ilsco, Panduit, Thomas & Betts, or approved.

C. Conductor Branch Circuits: Spring connectors, wire nuts, for conductors 18 through 8AWG. Manufacturers: 3M, Ideal, Scotch-Lock, or approved.

2.03 BOXES

A. Weatherproof Outlet Boxes (Lockable): Provide corrosion-resistant Malleable iron weatherproof outlet wiring boxes, of the type, shape and size, including depth of box, with threaded conduit ends, cast metal face plate with spring-hinged waterproof cap suitably configured for each application, including face plate gasket, blank plugs and corrosion proof fasteners. Weatherproof boxes to be constructed to have smooth sides, gray finish. Spring City Electrical Manufacturing Co., or approved equal. Provide a minimum of 12 keys for the box.

B. Junction and Pull Boxes: Provide galvanized sheet steel junction and pull boxes, with screw-on covers; of the type shape and size, to suit each respective location and installation; with welded seams and equipped with steel nuts, bolts, screws and washers. Junction boxes to be Spring City Electrical Manufacturing Co, or approved equal. Pull Boxes to be Circle AW, or approved equal.

C. Box Extension Adapter: Malleable Iron construction. Install over flush wall outlet boxes to permit flexible raceway extension to equipment. Spring City Electrical Manufacturing Co., or approved equal.

D. Conduit Fittings: Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts and plastic conduit bushings of the type and size to suit each respective use and installation. O-Z Gedney, or approved equal.

2.04 SAFETY DISCONNECTS

A. Manual Motor Starters: Quick-make, quick-break. Thermal overload protection. Device labeled with maximum voltage, current and horsepower. Square D Class 2510, or approved equal. Provide NEMA 1 enclosure for indoors, NEMA 3R enclosure for outdoors.

B. Safety Switches: Heavy duty, fused type, dual rated, quick-make, quick-break with fuse rejection feature for use with Class R fuses only, unless other fuse type is specifically noted. Provide NEMA 1 enclosure for indoors, NEMA 3R enclosure for

outdoors. Switches clearly marked for maximum voltage, current and horsepower. Equip enclosure with defeatable cover interlock. Switches rated for maximum available fault current. Approved Manufacturers: Square D, or approved equal.

PART 3 - EXECUTION

3.01 ELECTRICAL CHARACTERISTICS

A. Verify electrical characteristics of equipment prior to installation of conduits and wiring for equipment.

3.02 MOTOR BRANCH CIRCUIT WIRING

A. Do not install electrical equipment or wiring on mechanical equipment without approval of Architect.

B. Connect motor branch circuits complete from panel to motor as required by code and manner herein described.

C. Motor starter, control devices and control wiring provided by other Divisions unless noted on Drawings.

3.03 APPLIANCE/UTILIZATION EQUIPMENT

A. Provide appropriate cable and cord cap for final connection unless equipment is provided with same. Verify special purpose outlet NEMA configuration and ampere rating with equipment supplier prior to ordering devices and coverplates.

3.04 INSTALLATION

A. Boxes:
1. Location: Locate boxes and conduit bodies so as to ensure accessibility of electrical wiring. Boxes shall be located and placed according to architectural and structural requirements.
2. Round Boxes: Avoid using round boxes where conduit must enter through side of box, which would result in a difficult and insecure connection with a locknut or bushing on the rounded surface.
3. Special Application: Provide weatherproof outlets for locations exposed to weather or moisture.
4. Knockout Closures: Provide knockout closures to cap unused knockout holes where blanks have been removed.
5. Outlet System: Provide electrical boxes and fittings as required for a complete installation. Include but not limited to outlet boxes, junction boxes, pull boxes, bushings, locknuts, and all other necessary components.

6. Code Compliance: Comply with CEC as applicable to construction and installation of electrical boxes and fittings and size boxes according to CEC, except as noted otherwise.
7. Junction boxes shall be bonded to ground, unless otherwise noted.
8. Conduits entering junction boxes shall be terminated with locknuts or appropriate fittings at the junction boxes.

B. Provide CEC-required disconnect switches whether specifically shown on Drawings or not. Provide disconnect switch in sight of each motor location unless otherwise noted. Provide disconnect switch in site of each motor controller. Motor controller disconnect equipped with lock-out/tag-out padlock provisions do not require a disconnect switch at the controlled motor location. Coordinate fuse ampere rating with installed equipment. Fuse ampere rating variance between original design information and installed equipment, size in accordance with Bussmann Fusetron 40C recommendations. Do not provide fuses of lower ampere rating than motor starter thermal units.

END OF SECTION

SECTION 26 22 00 - LOW-VOLTAGE TRANSFORMERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. General Purpose Transformers

1.02 REFERENCE STANDARDS

A. Institute of Electrical and Electronics Engineers:
   1. IEEE C57.96 – Guide for Loading Dry-Type Distribution and Power Transformers

B. National Electrical Contactors Association:
   1. NECA 409 – Standard for Installing and Maintaining Dry-Type Transformers

C. National Electrical Manufacturers Association:
   1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
   2. NEMA ST 1 – Specialty Transformers
   3. NEMA ST 20 - Dry Type Transformers for General Applications.

D. Underwriters Laboratories Inc.:
   1. UL 506 – Standard for Safety Specialty Transformers
   2. UL 1561 - Standard for Dry-Type General Purpose and Power Transformers.

1.03 SUBMITTALS

A. Product Data: Include voltage, kVA, impedance, tap configurations, insulation system class and rated temperature rise, efficiency, sound level, enclosure ratings, outline and support point dimensions, weight, required clearances, service condition requirements, and installed features.
   1. External Vibration Isolators: Include attachment method, rated load, and deflection.

B. Shop Drawings: Provide dimensioned plan and elevation views of transformers and adjacent equipment with all required clearances indicated.
   1. Identify mounting conditions required for equipment seismic qualification.
   2. Provide equipment center of gravity identification for items weighing 2,000 lb. or more. Clearly indicate center of gravity locations in x, y, and z coordinates on equipment submittals. Provide lift plan with loads at each lift point.

C. Manufacturer's equipment seismic qualification certification.

D. Source Quality Control Test Reports: Include reports for tests designated in NEMA ST 20 as design and routine tests.

E. Field Quality Control Test Reports.

F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and maintenance of product.

G. Project Record Documents: Record actual locations of transformers

1.04 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.

B. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

PART 2 - PRODUCTS

2.01 TRANSFORMERS – GENERAL REQUIREMENTS.

A. Description: Factory-assembled, dry type transformers for 60 Hz operation designed and manufactured in accordance with NEMA ST 20 and listed, classified, and labeled as suitable for the purpose intended.

B. Seismic Qualification: Provide transformers suitable for application under seismic design criteria where required. Include certification of compliance with submittals.

C. Unless noted otherwise, transformer ratings indicated are for continuous loading according to IEEE C57.96 under the following service conditions:
1. Altitude: Less than 3,300 feet.
2. Ambient Temperature: 40 degrees C

D. Basic Impulse Level: 10 kV.

E. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.

F. Isolate core and coil from enclosure using vibration-absorbing mounts, except for sand and resin insulated transformers.

G. Nameplate: Include transformer connection data, ratings, wiring diagrams, and over-load capacity based on rated winding temperature rise.

H. Manufacturer to be Square D, or approved equal.

I. Do not use fans, moving parts, or internal protection devices.

2.02 GENERAL PURPOSE TRANSFORMERS

A. Description: Self-cooled, two winding transformers listed and labeled as complying with UL 506 or UL 1561; ratings as indicated.

B. Primary Voltage: As indicated on the drawings.

C. Secondary Voltage: As indicated on the drawings.

D. Insulation System and Allowable Average Winding Temperature Rise:
1. Less than 15 kVA: Class 180 degrees C insulation system with 115 degrees C average winding temperature rise.
2. 15 kVA and Larger: Class 220 degrees C insulation system with 150 degrees C average winding temperature rise.

E. Coil Conductors: Continuous copper windings with terminations brazed or welded.

F. Winding Taps:
1. Less than 3 kVA: None.
2. 3 kVA through 15 kVA: Two 5 percent full capacity primary taps below rated voltage.
3. 15 kVA through 300 kVA: Two 2.5 percent full capacity primary taps above and four 2.5 percent full capacity primary taps below rated voltage.
4. 500 kVA and Larger: Two 2.5 percent full capacity primary taps above and two
5. 2.5 percent full capacity primary taps below rated voltage.

G. Energy Efficiency: Comply with 10 CFR 431, Subpart K.

H. Mounting Provisions:
1. Less than 15 kVA: Suitable for wall mounting.
2. 15 kVA through 75 kVA: Suitable for wall, floor, or trapeze mounting.
3. Larger than 75 kVA: Suitable for floor mounting.

I. Transformer Enclosure: Comply with NEMA ST 20.
1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
   a. Indoor clean, dry locations: Type 1.
   b. Outdoor locations: Type 3R.

2. Construction: Steel.
   a. Less than 15 kVA: Totally enclosed, non-ventilated.
   b. 15 kVA and Larger: Ventilated.
3. Finish: Manufacturer's standard grey, unless otherwise indicated.
4. Provide lifting eyes or brackets.

J. Accessories:
1. Mounting Brackets: Provide manufacturer's standard brackets.
2. Weathershield Kits: Provide for ventilated transformers installed outdoors to provide a listed NEMA 250, type 3R assembly.
3. Lug Kits: Sized as required for termination of conductors as indicated on the drawings.

2.03 SOURCE QUALITY CONTROL

A. Factory test transformers according to NEMA ST 20.

B. Sound Level Tests: Perform factory test designated in NEMA ST 20 as "design" test on each production unit.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that suitable support frames and anchors are installed where required and that mounting surfaces are ready to receive transformers.

C. Perform pre-installation tests and inspections on transformers per manufacturer's instructions and as specified in NECA 409. Correct deficiencies prior to installation.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Provide concrete pads.

3.03 INSTALLATION

A. Set transformer plumb and level.

B. Install products in accordance with manufacturer's instructions.

C. Use flexible conduit, 2 feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.

D. Arrange equipment to provide minimum clearances as specified on transformer name-plate and in accordance with manufacturer's instructions and NFPA 70 with California Amendments.

E. Support transformers.
   1. Use integral transformer flanges, accessory brackets furnished by manufacturer, or field-fabricated supports to support wall-mounted transformers.
   2. Mount floor-mounted transformers on vibration isolating pads suitable for isolating transformer noise from building structure.
   3. Use trapeze hangers assembled from threaded rods and metal channel (strut) to support suspended transformers. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

F. Provide seismic restraints.

G. Install grounding and bonding.

H. Remove shipping braces and adjust bolts that attach the core and coil mounting bracket to the enclosure according to manufacturer's recommendations in order to reduce audible noise transmission.

I. Where not factory-installed, install lugs sized as required for termination of conductors as indicated.

J. Where furnished as a separate accessory, install transformer weathershield per manufacturer's instructions.

3.04 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform inspections and tests listed in NETA ATS Sections 7.2.1.1 and 7.2.1.2 for transformers 300 kVA and larger.

C. Measure primary and secondary voltages and make appropriate tap adjustments.

3.05 CLEANING

A. Clean existing transformers to remain or to be reinstalled.

END OF SECTION

SECTION 26 24 13 - SWITCHBOARDS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes main and distribution switchboards.

1.02 REFERENCES

A. American National Standards Institute:
   1. ANSI C12.1 - Code for Electricity Metering.
   2. ANSI C39.1 - Requirements, Electrical Analog Indicating Instruments.

B. Institute of Electrical and Electronics Engineers:
   1. IEEE C57.13 - Standard Requirements for Instrument Transformers.
   2. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.

C. National Electrical Manufacturers Association:
   1. NEMA FU 1 - Low Voltage Cartridge Fuses.
   2. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
   3. NEMA PB 2 - Deadfront Distribution Switchboards.
   4. NEMA PB 2.1 - General Instructions for Proper Handling, Installation, Operation, and Maintenance of Deadfront Distribution Switchboards Rated 600 Volts or Less.

D. International Electrical Testing Association:
   1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

E. Underwriters Laboratories Inc.:
   1. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.
   2. UL 891 - Dead-Front Switchboards.

1.03 SUBMITTALS

A. Shop Drawings: Indicate front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars for each phase, neutral, and ground; and switchboard instrument details.

B. Product Data: Submit electrical characteristics including voltage, frame size and trip ratings, fault current withstand ratings, and time-current curves of equipment and components.

C. Test Reports: Indicate results of factory production and field tests.

1.04 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations, configurations, and ratings of switchboards and their components on single line diagrams and plan layouts.

B. Operation and Maintenance Data: Submit spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver in 48-inch maximum width shipping splits, individually wrapped for protection and mounted on shipping skids.

B. Accept switchboards on site. Inspect for damage.

C. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.

D. Handle in accordance with NEMA PB 2.1. Lift only with lugs provided. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Conform to NEMA PB 2 service conditions during and after installation of switchboards.

1.08 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.09 SEQUENCING

A. Sequence Work to avoid interferences with building finishes and installation of other products.

1.10 MAIN SERVICE SWITCHBOARD

A. Contractor shall furnish and install all main switchboard equipment, distribution panels, and sub panels as indicated on the drawings. Acceptable manufacturers shall be Square D, General Electric or Seimens.

B. Switchboard shall be of the totally enclosed type, constructed of code gauge, fully finished steel. Front panels shall be removable, including panel covering incoming service, current transformer compartment, and metering mounting.

C. Switchboard shall be weatherproof, free standing (90" high +) with double lock provisions for locking by the utility company and owner.

D. Switchboard shall have a main disconnect with proper facilities for current transformers and metering equipment shall meet all the requirements of the utility company.

E. All bussing shall be copper.

F. Distribution section shall be of circuit breaker type utilizing thermal magnetic type circuit breakers with frame sizes as shown on single line diagram. Provide full-length bus in each section.

G. All circuit breakers shall be identified with Bakelite engraved nameplates.

H. Spaces for future circuit breakers shall include all hardware, bus taps, etc. necessary to permit the field installation of breaker units. The hardware shall be equipped with insulating tube or boot.

I. All conductors shall be copper, type THWN-2 "stranded" only.

J. Provide independent locking means for all breakers installed in switchgear. Breakers should be capable of being locked off independently of each other.

1.11 GROUNDING AND BONDING

A. Grounding and bonding shall be installed as required by the applicable codes, rules, regulations and safety orders. Attention is directed to Article 250 of the California Electrical Code and to Article 250, Title 24, Part 3.

B. Submit test reports certifying resistance values for buried or driven grounds and water pipegrounds as per CEC.

C. **The service neutral and enclosure shall be grounded.**

D. All raceways systems, supports, cabinets, switchboard, control equipment, motor frames, lighting fixtures, and utilization apparatus shall be permanently and effectively grounded.

E. Raceway is not allowed as Equipment Bonding or grounding.

F. All raceways exclusive of telephone and signal shall contain a code size copper conductor, green insulated, properly bonded to equipment at either end and to metallic portions of the same raceway.

G. All grounding type receptacles shall be bonded to outlet box, using code size copper conductor, green insulated, attached to receptacle grounding terminal and to lug or screw terminal in box. This requirement is also provided in CEC Article 250-74.

H. Provide bonding conductor around flexible metallic conduit (Greenfield). Bonding conductor shall be inside flex.

I. Raceway size shall be increased if necessary, to accommodate bonding conductors and shall be based on raceway fill tables.

J. All Ground conductors inside Switchgear, Panelboards, Subpanel and Terminal Cans shall terminate on bonded ground terminal strips. Terminal strip shall be secured to the box/can with drilled and tapped machine screws, they shall not be “thru-bolted” or secured via self tapping screws.

K. All ground rods shall be embedded at six (6) inches below ground level. The top six (6) inches of ground rod shall be encased in ground well to allow access to grounding electrode conductor’s termination points, unless otherwise noted.

PART 2 - PRODUCTS

2.01 DISTRIBUTION SWITCHBOARDS

A. Product Description: NEMA PB 2 and UL 891, enclosed switchboard with electrical ratings and configurations as indicated on Drawings.

B. Device Mounting:
1. Main Section: Individually mounted and compartmented.
2. Distribution Section: Individually mounted.
3. Auxiliary Section: Individually mounted.

C. Bus:
1. Material: Copper standard size.
2. Connections: Bolted, accessible from front for maintenance.
3. Insulation: Fully insulate load side bus bars. Do not reduce spacing of insulated bus.

D. Ground Bus: Insulated, extend length of switchboard.

E. Minimum Short Circuit Rating: 65,000 symmetrical amperes rms, fully rated or as indicated on drawing.

F. Line and Load Terminations: Accessible from front of switchboard, suitable for conductor materials and sizes as indicated on Drawings.

G. Utility Metering Compartment: Furnish metering transformer compartment for Utility Company's use, in accordance with Utility Company requirements.

H. Pull Section: Size as indicated on Drawings.

I. Pull Box: Removable top and sides, same construction as switchboard size as indicated on Drawings.

J. Future Provisions: Fully equip spaces for future devices with bussing and bus connections, insulated and braced for short circuit currents. Furnish continuous current rating as indicated on Drawings.

K. Enclosure: Type 1 - General Purpose for indoor and Type 3R – Raintight for outdoor.

L. Align sections at front and rear.

M. Switchboard Height: 90 inches, excluding floor sills, lifting members and pull boxes.

N. Finish: Manufacturer's standard light gray enamel over external surfaces. Coat internal surfaces with minimum one coat corrosion-resisting paint, or plate with cadmium or zinc.

O. Mimic Bus: Show bussing, connections and devices in single line form on front panels of switchboard using black color factory painting, fastened flat against panel face with screws.

P. Manufacturer to be Square D, or approved equal.

2.02 MOLDED CASE CIRCUIT BREAKER

A. Product Description: UL 489, molded-case circuit breaker.

B. Field-Adjustable Trip Circuit Breaker: Circuit breakers with frame sizes 200 amperes and larger have mechanism for adjusting long time delay, short time delay, continuous current, short time pickup, long time pickup, instantaneous pickup setting for automatic operation. Range of Adjustment: seconds, amperes, percent.

C. Field-Changeable Ampere Rating Circuit Breaker: Circuit breakers with frame sizes 200 amperes and larger have changeable trip units.

D. Current Limiting Circuit Breaker: Circuit breaker indicated as current-limiting have automatically-resetting current limiting elements in each pole. Let-through Current and Energy: Less than permitted for same size Class RK-5 fuse.

E. Solid-State Circuit Breaker: Electronic sensing, timing, and tripping circuits for adjustable current settings; ground fault trip with integral ground fault sensing and zero sequence type ground fault sensor; instantaneous trip; and adjustable short time trip.

F. Current Limiter: Designed for application with molded case circuit breaker.
   1. Coordinate limiter size with trip rating of circuit breaker to prevent nuisance tripping and to achieve interrupting current rating specified for circuit breaker.
   2. Interlocks trip circuit breaker and prevent closing circuit breaker when limiter compartment cover is removed or when one or more limiter is not in place or has operated.

2.03 INSULATED CASE CIRCUIT BREAKER

A. Product Description: UL 489, enclosed, insulated-case circuit breaker.

B. Trip Unit: Electronic sensing, timing, and tripping circuits for adjustable current settings; ground fault trip with integral ground fault sensing and zero sequence type ground fault sensor; instantaneous trip; and adjustable short time trip.

2.04 GROUND FAULT DEVICES

A. Ground Fault Sensor: Zero sequence type.

B. Ground Fault Relay: Adjustable ground fault sensitivity from 200 to 1200 amperes, time delay adjustable from 0 to 15 seconds. Furnish monitor panel with lamp to indicate relay operation, TEST and RESET control switches.

2.05 TRANSIENT VOLTAGE SUPPRESSION DEVICES

A. Product Description: IEEE C62.41, factory-mounted transient voltage surge suppressor, selected to meet requirements for high exposure and to coordinate with system circuit voltage. Minimum surge current capability per phase shall be 250kA for service entrance switchboard and 160kA for distribution switchboards.

2.06 AMMETERS AND VOLTMETERS

A. Ammeters: ANSI C39.1; direct-reading, full range, indicating ammeter with 4.5 inch square recessed case and 250 degree scale, white dial with black figures and pointer, 5 ampere, 60 Hertz movement, 1 percent accuracy.

B. Voltmeters: ANSI C39.1; direct-reading, full range, indicating voltmeter with 4.5 inch square recessed case and 250 degree scale, white dial with black figures and pointer, 120 volt, 60 Hertz movement, 1 percent accuracy.

2.07 METER TRANSFER SWITCHES

A. Ammeter Transfer Switch: Rotary multistage snap-action type with 600 volt AC-DC silver plated contacts, engraved escutcheon plate, pistol-grip handle, and four positions including OFF.

B. Voltmeter Transfer Switch: Rotary multistage snap-action type with 600 volt AC-DC silver plated contacts, engraved escutcheon plate, pistol-grip handle, and four positions including OFF.

2.08 POWER METERS

A. Watt-hour Meters and Wattmeters: ANSI C12.1; three phase induction type with two stators, each with current and potential coil, rated 5 amperes and 120 volts at 60 Hertz. Meter suitable for connection to 3- and 4-wire circuits. Furnish potential indicating

B. Potential indicating lamps; adjustments for light and full load, phase balance, and power factor; four-dial clock register; integral demand indicator and contact devices to operate remote im- pulse-totalizing demand meter; ratchets to prevent reverse rotation; removable meter with draw-out test plug; semi-flush mounted case with matching cover.

C. Impulse-Totalizing Demand Meter: ANSI C12.1; suitable for use with switchboard watt-hour meter, including two circuit totalizing relay; cyclometer; four dial totalizing kilowatt-hour register; positive chart drive mechanism; capillary pen holding minimum one-month ink supply; and roll chart with minimum 31-day capacity. Indicate and record fifteen minute integrated demand of totalized system.

D. Furnish meters with appropriate multiplier tags.

2.09 METERING TRANSFORMERS

A. Current Transformers: IEEE C57.13; 5 ampere secondary, wound type, with single secondary winding and secondary shorting device, primary/secondary ratio as indicated on Drawings, burden and accuracy consistent with connected metering and relay devices, 60 Hertz.

B. Potential Transformers: IEEE C57.13; 120 volt single secondary, disconnecting type with integral fuse mountings, primary/secondary ratio as indicated on Drawings, burden and accuracy consistent with connected metering and relay devices, 60 Hertz.

2.10 ACCESSORIES

A. Circuit Breaker Lifting Device: Portable, floor supported, elevating carriage with roller base, for movement of circuit breakers in and out of switchboard structure.

B. Furnish thermostatically controlled electric heaters in each section, sized to prevent condensation under expected weather conditions at Project site. Furnish terminals for separate connection of heater power circuit. Voltage Rating: 120 volts.

C. Concrete: 3,000 psi.

2.11 SOURCE QUALITY CONTROL

A. Furnish shop inspection and testing in accordance with NEMA PB 2.

B. Make completed switchboard available for inspection at manufacturer's factory prior to packaging for shipment. Notify Owner at least seven days before inspection is allowed.

C. Allow witnessing of factory inspections and tests at manufacturer's test facility. Notify Owner at least seven days before inspections and tests are scheduled.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify surface is suitable for switchboard installation.

3.02 INSTALLATION

A. Install in accordance with NEMA PB 2.1.

B. Tighten accessible bus connections and mechanical fasteners after placing switchboard.

C. Install fuses in each switch and coordinate sizes with connected load.

D. Install engraved plastic nameplates.

E. Install breaker circuit directory.

F. Ground and bond switchboards.

3.03 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform inspections and tests listed in NETA ATS, Section 7.1.

3.04 ADJUSTING

A. Adjust operating mechanisms for free mechanical movement.

B. Tighten bolted bus connections.

C. Adjust circuit breaker trip and time delay settings to values as indicated on Fault, Coordination, and ArcFlash Study.

3.05 CLEANING

A. Touch up scratched or marred surfaces to match original finish.

END OF SECTION

SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Distribution and branch circuit panelboards.

1.02 REFERENCE STANDARDS

A. Institute of Electrical and Electronics Engineers:
   1. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.

B. National Electrical Manufacturers Association:
   1. NEMA FU 1 - Low Voltage Cartridge Fuses.
   2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
   3. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
   4. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
   5. NEMA PB 1 - Panelboards.
   6. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.

C. International Electrical Testing Association:
   1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

D. National Fire Protection Association:
   1. NFPA 70 - National Electrical Code with California Amendments.

E. UL:
   1. UL 50 - Cabinets and Boxes
   2. UL 67 - Safety for Panelboards.
   3. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.
   4. UL 1283 - Electromagnetic Interference Filters.
   5. UL 1449 - Transient Voltage Surge Suppressors.
   6. UL 1699 - Arc-Fault Circuit Interrupters.

1.03 SUBMITTALS

A. Product Data: Submit catalog data showing specified features of standard products.

B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker, and fusible switch arrangement and sizes.

C. Source Quality control submittals: Indicate results of factory tests and inspections.

D. Field Quality Control Submittals: Indicate results of Contractor furnished tests and inspections.

1.04 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of panelboards and record actual circuiting arrangements.

B. Operation and Maintenance Data: Submit spare parts listing, source and current prices of replacement parts and supplies, and recommended maintenance procedures and intervals.

1.05 QUALITY ASSURANCE

A. Qualifications
1. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

PART 2 - PRODUCTS

2.01 DISTRIBUTION PANELBOARDS

A. Description: NEMA PB 1, circuit breaker type panelboard.

B. Operation:
1. Minimum integrated short circuit rating as indicated on Drawings.

C. Materials
1. Panelboard Bus: Copper current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.
2. Molded Case Circuit Breakers: UL 489, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Furnish circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.
3. Molded Case Circuit Breakers with Current Limiters: UL 489, circuit breakers with replaceable current limiting elements, in addition to integral thermal and instantaneous magnetic trip in each pole.
4. Current Limiting Molded Case Circuit Breakers: UL 489, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical A, let-through current and energy level less than permitted for same size NEMA FU 1, Class RK-5 fuse.

5. Circuit Breaker Accessories: Trip units and auxiliary switches as indicated on Drawings.
6. Surge Suppressers: Integrated in panelboard.
7. Enclosure: NEMA PB 1, Type 1 for indoor and 3R for outdoor applications.
8. Cabinet Front: Surface door-in-door type, fastened with concealed trim clamps, hinged door with flush lock, and metal directory frame.
9. Distribution panels installed in outdoor locations shall be free standing in NEMA 3R enclosure. Equipped with heater(s) and thermostat. Heater(s) shall prevent condensation from forming in the inside of the panel. Set thermostat at fifty-five degrees (55º) f.

D. Finishes:
1. Manufacturer's standard gray enamel.

E. Manufacturer:
1. Square D, or approved equal.

2.02 BRANCH CIRCUIT PANELBOARDS

A. Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.

B. Materials:
1. Panelboard Bus: Copper current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.
2. For non-linear load applications subject to harmonics furnish 200 percent rated, plated copper, solid neutral.
3. Minimum Integrated Short Circuit Rating or as indicated on Drawings.
4. Molded Case Circuit Breakers: UL 489, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers as indicated on Drawings. Provide UL class 760 arc-fault interrupter circuit breakers as indicated on Drawings. Do not use tandem circuit breakers..
5. Current Limiting Molded Case Circuit Breakers: UL 489, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical A, let-through current and energy level less than permitted for same size NEMA FU 1, Class RK-5 fuse.
6. Surge Suppresser: Integrated in panelboard.
7. Enclosure: NEMA PB 1, Type 1 for indoor and Type 3R outdoor applications.
8. Cabinet Box: 6 inches deep, 20 inches.

C. Cabinet Front: Flush or surface cabinet front as indicated on drawings with door-in-door concealed trim clamps, concealed hinge, metal directory frame, and flush lock keyed alike. Finishes:
1. Finish in manufacturer's standard gray enamel.

2.03 SOURCE QUALITY CONTROL

A. Independently test integral surge suppressers with category C3 high exposure wave-form (20 kV-1.2/50us, 10kA-8/20 us) per IEEE C62.41.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install panelboards according to NEMA PB 1.1.

B. Install panelboards plumb.

C. Install recessed panelboards flush with wall finishes.

D. Height: 6 feet to top of panelboard; install panelboards taller than 6 feet with bottom no more than 4 inches above floor.

E. Install filler plates for unused spaces in panelboards.

F. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes to balance phase loads. Identify each circuit as to its clear, evident and specific purpose of use.

G. Install engraved plastic nameplates.

H. Ground and bond panelboard enclosure. Connect equipment ground bars of panels according to NFPA 70 with California Amendments.

3.02 FIELD QUALITY CONTROL

A. Inspect and test according to NETA ATS, except Section 4.

B. Perform circuit breaker inspections and tests listed in NETA ATS, Section 7.6.

C. Perform switch inspections and tests listed in NETA ATS, Section 7.5.

D. Perform controller inspections and tests listed in NETA ATS, Section 7.16.1.

3.03 ADJUSTING

A. Measure steady state load currents at each panelboard feeder; rearrange circuits in panelboard to balance phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

END OF SECTION

SECTION 26 26 53 – ELECTRIC VEHICLE CHARGING EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes EV charging equipment that provides Level 2 EV Charging

1.02 REFERENCE STANDARDS

A. SAE International (SAE):
   1. SAE J1772 - SAE Electric Vehicle Conductive Charge Coupler.

B. Federal Communications Commission (FCC):
   1. FCC Part 15 – Radio Frequency Devices

C. California Electric Code (CEC):
   1. CEC Article 625 – Electric Vehicle Power Transfer System

D. Open Charge Point Protocol (OCPP)
   1. OCPP 1.6

E. Underwriters Laboratories Inc (UL) / Canadian standards Association (CSA):
   1. UL 62 – Flexible Cords and Cables
   2. UL 1998 / CSA-C22.2 No. 61508-1:17 – Standard for Software in Programmable Components
   3. UL 2231-1 / CSA C22.2 No 281.1-12 – Standard for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits; Part 1: General Requirements
   4. UL 2231-2 / CSA C22.2 No 281.2-12 – Standard for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: Particular Requirements for Protection Devices for Use in Charging Systems
   5. UL 2251 / CSA C22.2 No. 282 – Standard for Plugs, Receptacles, and Couplers for Electric Vehicles
   6. UL 2594 / CSA C22.2 No. 280-16 – Standard for Electric Vehicle Supply Equipment (EVSE)

1.03 DEFINITIONS

A. EV: Electric Vehicle

B. EV Cable: The off-board cable containing the conductor(s) to connect the EV power controller to the EV that provides both power and communications during energy transfer.

C. EV Capable: Parking spaces that include nearby termination of raceway (conduit) to a power source with sufficient electrical panel capacity designed for simultaneous charging of electric vehicles in all planned EV parking spaces. Electrical wiring need not be pulled through raceway (conduit) until charging station is installed.

D. EV Charger or EV Charging Equipment: See "EVSE".

E. EV Connector: A conductive device that, when electrically coupled to an EV inlet, establishes an electrical connection to the EV for the purpose of power transfer and information exchange. This device is part of the EV coupler.

F. EV Coupler: A mating EV inlet and connector set.

G. EV Inlet: The device in the vehicle into which the EV connector is inserted, and a conductive connection is made for the transfer of power and communication. This device is part of the EV coupler.

H. EVSE: Electric Vehicle Supply Equipment. It includes the EV charging equipment and conductors, including the ungrounded, grounded, and equipment grounding conductors and EV cables, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for transferring energy between the premise wiring and the EV.

1.04 SUBMITTALS

A. The following information shall be submitted to the engineer
1. Dimensioned outline drawing
2. Component list
3. Knockout configurations
4. Product data sheets

1.05 CLOSEOUT SUBMITTALS

A. The following information shall be submitted for record purposes:
1. Final as-built drawings and information for items listed in Paragraph 1.04, and shall incorporate all changes made during the manufacturing process
2. Wiring diagrams
3. Installation information

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. The EVSE manufacturer shall stock the Level 2 chargers in the United States to facilitate fast and easy deliveries to the job site.

B. If EVSE is being stored prior to installation, then the EVSE shall be stored so as to maintain the equipment in a clean and dry condition as required by the manufacturer's instructions, in accordance with manufacturer's instructions. (1) copy of these instructions shall be included with the equipment at time of shipment.

C. Deliver electric vehicle chargers in factory labeled packages.

D. Protect from damage due to weather, excessive temperature, and construction operations.

1.08 WARRANTY

A. Manufacturer and Installer agree to repair or replace components of EV charging units that fail(s) in materials or workmanship according to the terms specified in the warranty

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product: Provide Leviton EV48S electric vehicle charging stations

2.02 EV CHARGING EQUIPMENT DESCRIPTION

A. Input Power options: A dedicated power feed will be required for each charger. No "Sharing" or "Pairing" of power thus reducing the output of the charger.

B. Input Voltage: 208-240V, 1-phase

C. Frequency: 60hz

D. Maximum Charging Current: 48A

E. Breaker Size: 60A

F. EV Cable and Connectors:
1. #7 SAE J1772 connector
2. 18-foot charger cable

G. Operating Temperature: 30ºC to 50ºC

H. Operating Humidity: <95% relative humidity, non-condensing

I. Short Circuit Current Rating: 20ma CCID per UL 2231

J. Enclosure:
   1. Material: Plastic
   2. Rating: Type 3R

K. Status Indicator: Power Present, Charging, Fault

L. Software: AmpUp Charing Station Management Software

M. Cover Locking Mechanism: Phillips head screw

N. Communication Methods: 4G Cellular

O. Input Protection: UVP, OVP, RCD, SPD, Ground Fault Protection

P. Output Protection: OCP, OTP, Control Pilot Fault Protection

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine the conditions under which electric vehicle chargers are to be installed. Notify the Architect and Engineer of record in writing of conditions detrimental to proper completion of the installation.

B. Examine roughing-in for EV charging equipment electrical conduit to verify that the required utilities are properly sized and in correct location.

C. Verify that required utilities are properly sized and in correct location.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Strictly comply with manufacturer's installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances and to prevent electrical hazards. Installation to comply with Article 625 of NFPA 70.

B. All installation work shall be performed by a qualified person who is familiar with the installation, construction and operation of the equipment and the hazards involved.

3.03 ADJUSTMENTS AND CLEANING

A. Remove debris from the Electric Vehicle Supply Equipment and wipe dust and dirt from all components.

B. Repaint marred and scratched surfaces with touch up paint to match original finish.

3.04 TESTING

A. Check tightness of all accessible mechanical and electrical connections to assure they are torqued to the minimum acceptable manufacture’s recommendations.

B. Check all installed charging systems for proper grounding, fastening, and alignment.

C. Complete installation and startup checks according to manufacturer's written instructions.

END OF SECTION

SECTION 26 28 00 - LOW-VOLTAGES CIRCUIT PROTECTIVE DEVICES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes
   1. This section describes the requirements for the circuit protective devices for this project.

1.02 REFERENCES

A. Federal Specification (FS):
   1. FS W-C-375; Circuit Breakers, Molded Case, Branch Circuit and Service.
   2. FS W-F-870; Fuseholders (for Plug and Enclosed Cartridge Fuses).

B. Underwriters Laboratories, Inc. (UL):
   1. UL 248(1-16); Low-Voltage Fuses.
   2. UL 489; Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
   3. UL 512; Fuseholders.
   4. UL 1066; Low Voltage AC and DC Power Circuit Breakers Used in Enclosures.

C. National Electrical Manufacturer Association (NEMA):
   1. NEMA AB 1; Molded Case Circuit Breakers.

1.03 SUBMITTALS

A. Product Data

B. Operation and Maintenance (O&M) Manuals

1.04 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the units specified herein shall be new, unused, and currently under production.

B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Delivery: Overcurrent Protective Device components shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by

rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner.

B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.

C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

PART 2 - PRODUCTS

2.01 FUSES

A. General: All power fuses shall be time-delay, high interrupting (300 K AIC), current limiting type, unless otherwise noted on the Drawings. All fuses shall be the product of a single Manufacturer and shall be selectively coordinated when applied in 2:1 ratios. Types of fuses shall be as follows:
1. 0 - 600 amperes: UL Class J, dual element, time delay type fuse with separate overload and short-circuit elements. The fuse shall hold 500% of rated current for a minimum of 10 seconds.
2. 601 - 4000 amperes: UL Class L, time delay type fuses with 99.9% pure silver fuse links and "O-rings" to seal between the end bells and the fuse barrel. Fuses shall hold 500% of rated current for a minimum of 4 seconds, clear 20 times rated current in 0.01 seconds or less.
3. Motor branch circuit fuses (0-600 amperes): UL Class J dual element, time delay type fuse. Motor branch circuit fuses shall be sized for Type 2 coordination for the motor controller and back-up motor overload protection and shall be coordinated with motor starter overload relay heaters.

B. Control and instrument fuses shall be suitable for installing in blocks or fuse holders. Exact type and rating shall be as recommended by the Manufacturer of the equipment being protected.

C. Fuses for installation in current limiting circuit breakers or motor circuit protectors shall meet the specific requirements of the Manufacturers of that equipment to ensure compatibility.

D. Fuses shall be by Cooper Industries Bussman Division, or approved equal.

2.02 MOLDED CASE CIRCUIT BREAKERS

A. Unless noted otherwise, circuit breakers shall be molded case, bolt on and trip indicating.

B. Where stationary molded case circuit breakers are indicated on the Drawings to be current limiting type, they shall be current limiting as defined by UL 489 and shall not employ any fusible elements.

C. Circuit breakers shall have interrupting capacity not less than that indicated on the Drawings or if not indicated, not less than 25,000 RMS symmetrical amps for 480 volt systems and 10,000 RMS symmetrical amps for 208 volt systems.

D. Covers shall be sealed on non-interchangeable breakers and trip unit covers shall be sealed on interchangeable trip breakers to prevent tampering. Circuit breaker ratings shall be clearly visible after installation or engraved nameplates shall be provided stating the rating. All ferrous parts shall be plated to minimize corrosion.

E. Circuit breakers shall be toggle, quick-make and quick-break operating mechanisms with trip-free feature to prevent contacts being held closed against overcurrent conditions in the circuit. Trip position of the breakers shall be clearly indicated by operating handles moving to a center position.

F. Multipole breakers shall have a single handle to open and close all contacts simultaneously in both manual operation and under automatic tripping. Interpole barriers shall be provided inside the breaker to prevent any phase-to-phase flashover. Each pole of the breaker shall have means for Arc extinguishing.

G. All terminals shall be rated for aluminum or copper wire.

H. Unless noted otherwise, circuit breakers with trip ratings 400 amp and smaller shall be ambient temperature compensated, thermal magnetic type unless otherwise noted. Breakers shall be of full size, 1" per pole type. Panels with more than one branch breaker larger than 100 amps shall be installed in distribution type panels.

I. Accessories: Provide accessories as noted on the Drawings, i.e. shunt-trip, auxiliary contacts, undervoltage trip, alarm switch, etc.

J. Spaces in the boards shall be able to accept any combination of 1, 2 or 3 pole circuit breakers as indicated. Provide all necessary bus, device supports and mounting hardware sized for frame, not trip rating.

K. Series rated breakers are not acceptable unless specifically noted on the Drawings.

L. Provide lockable breakers for equipment disconnects as indicated on the Drawings.

M. Circuit breakers shall be Square D, or approved equal.

PART 3 - EXECUTION

A. The Contractor shall supply a suitable and stable source of electrical power to each test site.

B. Testing of overcurrent protective devices shall be done only after all devices are installed and system is energized.

C. Prefunctional testing:
   1. Visual and mechanical inspection:
      a. Inspect for physical damage, defects alignment and fit.
      b. Perform mechanical operational tests in accordance with Manufacturer's instructions.
      c. Compare nameplate information and connections to Contract Documents.
      d. Check tightness of all control and power connections.
      e. Check that all covers, barriers and doors are secure.
   2. Electrical tests:
      a. Circuit continuity: All feeders shall be tested for continuity. All neutrals shall be tested for improper grounds.
      b. Determine that circuit breaker will trip under overcurrent condition, with tripping time in conformance with NEMA AB 1 requirements.
      c. Test all circuit breakers with frame size 225 amps and larger and 10 percent of all circuit breakers with frame sizes less than 225 amps in each panelboard, distribution board, switchboard, etc. unless otherwise noted.

D. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.

E. Contractor shall submit the final test report for review prior to Project closeout and final acceptance by the Owner. Test report shall indicate test dates, devices tested, results, observation, deficiencies and remedies. Test report shall be included in the operation and maintenance manuals.

3.02 ADJUSTING

A. Adjust circuit breaker trip settings for coordination with other overcurrent protective devices in system.

B. Adjust circuit breaker trip settings for adequate protection from overcurrent and fault currents.

3.03 CLEANING

A. Upon completion of Project prior to final acceptance the Contractor shall thoroughly clean overcurrent protective devices per Manufacturer's approved methods and materials. Remove paint splatters and other spots, dirt and debris.

END OF SECTION

SECTION 26 56 00 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:
   1. Exterior luminaires.
   2. Ballasts.
   3. Lamps.
   4. Poles and accessories.
   5. Luminaire accessories.

1.02 REFERENCE STANDARDS

A. American Society of Civil Engineers
   1. ASCE 7-16 – Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

B. American Society for Testing and Materials
   1. ASTM A641/A641M – Standard Specification for Zinc-Coated (Galvanized Carbon Steel Wire.

C. California Building Standards Code (California Code Regulations, Title 24):
   1. CAL TITLE 24 P3 – California Electrical Code (NFAP 70 with California Amendments), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
   2. CAL TITLE 24 P6 – California Energy Code, edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).
   3. CAL TITLE 24 P11 – California Green Building Standard Code, edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA)

D. Institute of Electrical and Electronic Engineers:
   1. IEEE C2 - National Electrical Safety Code.
   2. IEEE C62.41.2 – Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits

E. Illuminating Engineering Society
   1. IES LM-63 - IESNA Standard File Format for Electronic Transfer of Photometric Data and Related Information.
   2. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products.
   3. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules.

F. National Electrical Contractors Association/Illuminating Engineering Society of North America:
   1. NECA 1 - Standard for Good Workmanship in Electrical Construction.
   2. NEMA C78.377 – Electric Lamps – Specifications for the Chromaticity of Solid-state Lighting Products.
   3. NECA/IESNA 501 - Standard for Installing Exterior Lighting Systems.

G. National Fire Protection Association:
   1. NFPA 70 - National Electrical Code with California Amendments.

H. Underwriters Laboratories:
   1. UL 1598 - Luminaires.
   2. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate placement of poles and associated foundations with utilities, curbs, sidewalks, trees, walls, fences, striping, etc. installed under other sections or by others. Coordinate elevation to obtain specified foundation height.

1.04 SUBMITTALS

A. Shop Drawings:
   1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
   2. Provide photometric calculations where luminaires are proposed for substitution.
   3. Provide structural calculations for each pole.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
   1. LED Luminaires:
      a. Include estimated useful life, calculated based on IES LM-80 test data.
      b. Include IES LM-79 test report.
   2. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IES LM-63 standard format upon request.
   3. Ballasts and LED Drivers: Include wiring diagrams and list of compatible lamp configurations.
   4. Lamps: Include rated life, color temperature, color rendering index (CRI), and initial and mean lumen output.
   5. Poles: Include information on maximum supported effective projected area (EPA) and weight for the design wind speed.

C. Certificates for Poles and Accessories: Manufacturer's documentation that products are suitable for the luminaires to be installed and comply with designated structural design criteria.

D. Certification that luminaire, ballast or LED driver, and lamps comply with CAL TITLE 24 P6 requirements.

E. Field Quality Control Reports.
   1. Include test report indicating measured illumination levels.

F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

G. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

H. Maintenance Materials: Furnish the following for LLNS's use in maintenance of project.
   1. Extra Lamps: Ten percent of total quantity installed for each type, but not less than two of each type.
   2. Extra Ballasts: Two percent of total quantity installed for each type, but not less than one of each type.
   3. Touch-Up Paint: 2 gallons, to match color of pole finish.

I. Project Record Documents: Record actual connections and locations of pole foundations, luminaires, and any pull or junction boxes.

1.05 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70 with California Amendments.

B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, handle, and store products according to NECA/IESNA 501 and manufacturer's written instructions.

B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.07 WARRANTY

A. Provide five-year manufacturer warranty for all LED luminaires, drivers, material, fixture finish, and workmanship. On-site warranty includes transportation, removal, and installation of new products.

1. Finish warranty includes warranty against failure and against substantial deterioration such as blistering, cracking, peeling, chalking, or fading.
2. Material warranty includes power supply units (drivers) and replacement with more than 10 percent of LED sources in any lightbar or subassembly are defection or non-starting.

B. Provide luminaire useful life certificate.

PART 2 - PRODUCTS

2.01 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

2.02 LED LUMINAIRES

A. Where a specific manufacturer or model is indicated elsewhere in the luminaire schedule or on the drawings, substitutions are not permitted unless explicitly indicated.

B. Provide products of the same type by the same manufacturer.

C. Provide products that comply with requirements of NFPA 70 with California Amendments, CAL TITLE 24 P3, and CAL TITLE 24 P6

D. Provide products that are listed and labeled as complying with UL 1598, where applicable.

E. Provide products that comply with the seismic requirements of ASCE 7-16.

F. Provide products listed, classified, and labeled as suitable for the purpose intended.

G. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts or lamp drivers, reflectors, lenses, housings, and other components required to position, energize, and protect the lamp and distribute the light.

H. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, and accessories as necessary for a complete operating system.

I. Provide products suitable to withstand normal handling, installation, and service without damage, distortion, corrosion, fading, or discoloring.

J. Provide products that meet the light pollution reduction requirements of CAL TITLE 24 P11 section 5.106.8

K. Provide luminaires listed and labeled as suitable for wet locations unless otherwise indicated.

L. LED Luminaires:
1. Components: UL 8750 recognized or listed as applicable.
2. Tested in accordance with IES LM-79 and IES LM-80 prior to shipment from the factory.
3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

2.03 POWER SUPPLY UNITS (DRIVERS)

A. Manufacturers:
1. Where a specific manufacturer or model is indicated elsewhere in the luminaire schedule or on the drawings, substitutions are not permitted unless explicitly indicated.

B. LED Drivers:
1. Minimum Efficiency: Provide drivers complying with current federal and CAL TITLE 24 P6 efficiency standards for ballasts and not less than 85 percent efficiency.
2. Drive current to each individual LED must not exceed the current limit specification of the LED manufacturer.
3. Rated to operation between ambient temperatures of 20 degrees F and 104 degrees F.
4. Designed to operation on the voltage system to which they are connected, typically ranging from for 120 to 480 V.
5. Operating Frequency: 60 Hz
6. Power Factor (PF): 0.90, minimum
7. Total Harmonic Distortion (THD): 20 percent, maximum
8. Must meet requirements of 47 CFR 15, class B
9. Control Compatibility: Fully compatible with the lighting controls to be installed.
10. Power Supply: Mounted integral to the luminaire. Remote mounting of power supply is prohibited.
11. Equipped with over-temperature protection circuit that turns lamp off until normal operating temperature is achieved.

C. Dimmable LED Drivers:
1. Dimming Range: Continuous dimming from 100 percent to 10 percent relative light output unless dimming capability to lower level is indicated, without flicker.
2. Control Compatibility: Fully compatible with the dimming controls to be installed.

D. LED Luminaire Surge Protection: Provide surge protection integral to luminaire to meet C low waveforms as defined by IEEE C62.41.2, scenario 1, location category C.

2.04 LAMPS

A. Lamps - General Requirements:
1. Unless explicitly excluded, provide new, compatible, operable lamps in each luminaire.

2. Verify compatibility of specified lamps with luminaires to be installed. Where lamps are not specified, provide lamps per luminaire manufacturer's recommendations.
3. Minimum Efficiency: Provide lamps complying with all current applicable federal and CAL TITLE 24 P6 lamp efficiency standards.
4. Color Temperature Consistency: Unless otherwise indicated, for each type of lamp furnish products which are consistent in perceived color temperature. Replace lamps that are determined to be inconsistent in perceived color temperature.
5. Light Distribution Pattern: As indicated on drawings.

B. LED Lamps:
1. Correlated Color Temperature (CCT): 4000 degrees K, nominal, in accordance with NEMA C78.377
2. Color Rendering Index (CRI): Greater than or equal to 70 for 4000-degree K light sources.
3. Color Consistency: Manufacturer must utilize a maximum 4-step MacAdam ellipse binning tolerance for color consistency of LEDs used in luminaires.

2.05 POLES

A. All Poles:
1. Provide poles and associated support components suitable for the luminaire(s) and associated supports and accessories to be installed.
2. Structural Design Criteria:
   a. Comply with AASHTO LTS.
   b. Wind Load: Include effective projected area (EPA) of luminaire(s) and associated supports and accessories to be installed.
      1) Design Wind Speed: 105 miles per hour, with gust factor of 1.3.
   c. Dead Load: Include weight of proposed luminaire(s) and associated supports and accessories.
   d. Include structural calculations demonstrating compliance with submittals.
3. Material: Anodized aluminum, unless otherwise indicated.
4. Shape: Square straight, unless otherwise indicated.
   a. Parking Lots and Roadways: 5-inch square.
   b. Bikeways, Pedestrian Pathways, Sidewalks, and Crosswalks: 4-inch square.
5. Pole Length: Provide pole length to ensure the fixture mounting heights as indicated on the drawings
6. Finish: Dark bronze, unless otherwise indicated.
7. Mounting: Install on concrete foundation, height as indicated on the drawings, unless otherwise indicated.
8. Unless otherwise indicated, provide with the following features/accessories:
   a. Handhole, 10-inch by 17-inch size.
   b. Anchor bolts with leveling nuts or leveling shims.
   c. Ground lug accessible from handhole.

B. Metal Poles: Provide ground lug, accessible from handhole.

2.06 CONTROLS

A. All controls for exterior lighting to be installed, tested, and commissioned as part of Increment 2

B. Photocells:
1. Designed to fail in the ON position
2. Provide hermetically sealed light sensor type.
3. Provide time delay to prevent accidental switching from transient light sources.
4. Provide surge protection.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install luminaires in accordance with NECA/IESNA 501.

C. Provide required support and attachment.

D. Pole-Mounted Luminaires:
1. Maintain the following minimum clearances:
a. Comply with IEEE C2.
b. Comply with utility company requirements.
2. Foundation-Mounted Poles:
a. Provide cast-in-place concrete foundations for poles unless otherwise indicated.
1) Install anchor bolts plumb per template furnished by pole manufacturer.
2) Position conduits to enter pole shaft.
b. Install foundations plumb.
c. Install poles plumb, using leveling nuts as required to adjust to plumb.
d. Tighten anchor bolt nuts to manufacturer's recommended torque.
e. Install non-shrink grout between pole anchor base and concrete foundation, leaving small channel for condensation drainage.

f. Install anchor base covers or anchor bolt covers as indicated.

3. Grounding:
   a. Bond luminaires, metal accessories, metal poles, and foundation reinforcement to branch circuit equipment grounding conductor.
4. Install separate service conductors, 10 AWG copper, from each luminaire down to handhole for connection to branch circuit conductors.
5. Provide dedicated handhole for each pole.

E. Install accessories furnished with each luminaire.

F. Bond products and metal accessories to branch circuit equipment grounding conductor.

3.03 FIELD QUALITY CONTROL

A. Inspect each product for damage and defects.

B. Operate each luminaire after installation and connection. Inspect for improper connections and operation.

C. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts.

D. Measure illumination levels to verify conformance with performance requirements.

E. Take measurements during night sky, without moon or with heavy overcast clouds effectively obscuring moon.

3.04 ADJUSTING

A. Aim and adjust luminaries to provide illumination levels and distribution as indicated on Drawings.

B. Luminaires with Field-Rotatable Optics: Position optics according to manufacturer's instructions to achieve lighting distribution as indicated.

3.05 CLEANING

A. Clean photometric control surfaces as recommended by manufacturer.

B. Clean finishes and touch up damage.

3.06 PROTECTION OF FINISHED WORK

A. Relamp luminaries having failed lamps at Substantial Completion.

B. Replace ballast and drivers that have failed at Substantial Completion.

END OF SECTION

SECTION 31 00 00 - EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

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

1.02 RELATED REQUIREMENTS

A. Section 01 5000, Temporary Facilities and Controls.

B. Section 01 5713, Erosion Control.

C. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

D. Section 31 2333, Trenching and Backfilling.

E. Section 32 1200, Asphalt Concrete Paving.

F. Section 32 1600, Site Concrete.

G. Section 32 8000, Irrigation.

H. Section 32 9000, Landscaping.

I. Section 33 0000, Utilities

J. Section 33 4000, Storm Drainage Utilities.

1.03 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

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

D. ASTM International (ASTM):

1. D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02e2 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
5. D422-63(2007) e1 Test Method for Particle Size Analysis of Soil.
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications Section 17.

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

G. Site survey: Included in the drawings, was prepared by **MCR Engineering, Inc., dated August 2025**, and is the basis for data regarding current conditions. While the survey is deemed generally accurate, there exists discrepancies and variations due to elapsed time, weather, etc. Existing dirt grades may vary 0.2 ft. from that shown.

H. Geotechnical Engineering Report: Prepared by **Mid Pacific Engineering, Inc. dated September 2025** and is on file with Architect. Soils information is taken from this Report. Contractor is responsible for any conclusions drawn from this data; should he prefer not to assume such risk he is under obligation to employ his own experts to analyze available information and/or to make additional explorations, at no cost to Owner, upon which to base his conclusions. Neither Owner, Soils Engineer nor Architect guarantees information will be continuous over entire site of work.

1.04 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

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

1.05 ACTION SUBMITTALS

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

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

1.07 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.08 QUALITY ASSURANCE

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

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

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

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

E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

F. Tests (See Part 3, Article "Testing and Observation" for Compaction Testing).

1.09 DELIVERY, STORAGE AND HANDLING

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

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1.10 FIELD CONDITIONS

A. Excavation dewatering may be necessary. Contractor shall provide any and all tools, equipment and labor necessary for excavation dewatering no matter what the source. Dewatering shall be continuous until all site utilities are installed and backfilled. Permitting for any dewatering operations shall be the responsibility of the contractor.

1.11 EXISTING SITE CONDITIONS

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

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

1.12 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

A. Ground-breaking requirements:

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

B. Underground Utility Locating:

1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work for excavation.
2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience.
3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.
4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".
5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:
   a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.

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b. All conduit pathways containing an active cable TV system.

c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.

d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.

e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.

f. All plastic and other nonconductive water lines in which a TransOnde Radiodetection) or other "transmitter" can be applied to create a low frequency pressure waive (signal) without damaging or triggering the existing systems.

g. All copper or steel waterlines and plastic or steel gas lines.

6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.

7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.

8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the district at no additional charge.

9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.

10. Contractor shall inform the District's Construction Manager and Architect no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

1.13 PROTECTION

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

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

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

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

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

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

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

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

I. Environmental Protection:

1. No ground-disturbing activities shall be allowed outside of the project construction boundary. Construction fencing shall be placed at the boundary of the project site to clearly mark the limits of ground-disturbing activities.
2. All project-related traffic shall be restricted to designated access roads, routes, and construction areas within the project boundary. No vehicular or pedestrian traffic shall be allowed outside the designated project boundary.
3. To prevent sediment, hazardous materials, and other pollutants from washing or running off into storm drain system on or outside the project site, the contractor shall implement best management practices as identified in a Storm Water Pollution Prevention Plan (SWPPP).
4. Dirt roadways or other areas of disturbed bare ground within 100 feet of elderberry shrubs will be watered at least twice a day to minimize dust emissions.
5. Contractor to avoid and protect all protected species.

1.14 SEASONAL LIMITS

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

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

1.15 TESTING

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

B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs

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of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

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

PART 2 - PRODUCTS

2.01 MATERIALS

A. Engineered Fill Materials: All fill shall be of approved local materials supplemented by imported fill if necessary. "Approved" local materials are defined as local soils tested and approved by Geotechnical Engineer free from debris, and concentrations of clay and organics; and contain rocks no larger than **2-inches** in greatest dimension. The soil and rock should be thoroughly blended so that all rock is surrounded by soil. This may require mixing of the soil and rock with a dozer prior to placement and compaction. Clods, rocks, hard lumps or cobbles exceeding **2-inches** in final size shall not be allowed in the upper **6 inches** of any fill. Native clay or clayey soils will not be permitted within the building pad areas or paved areas.

B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have **plasticity index of** 15 or less; **expansion index of 20 or less;** organic content less than 4%; and be free of particles greater than **3-inch** in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. <u>All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site.</u> Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.

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

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4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sample Schedule	
Area Of Individual Borrow Area	**Sampling Requirements**
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ acre
4 to 10 Acres	Minimum of 8 samples
Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location

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

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

C. Landscape Backfill Material:

1. The top **4 inches** of native topsoil stripped from the site may be used for landscape backfill material provided it meets the requirements as specified in Section 32 9000.
2. Imported Topsoil may be required to complete work. See Section **32 9000** for requirements. Proposed Topsoil material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.

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

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

F. Decomposed Granite: Decomposed Granite shall be well graded mixture of fine to 1/8" particles in size with no clods. The material shall be free of vegetation, other soils, debris and rock. The material shall be redish-tan to tan in color.

G. Decomposed Granite Solidifier: PolyPavement or equal.

PART 3 - EXECUTION

3.01 INSPECTION LAYOUT AND PREPARATION

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

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

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

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

3.02 PERFORMANCE

A. GENERAL:

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

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

A. All other obstructions, such as abandoned utility lines, septic tanks, concrete foundations, and the like shall be removed from site. Excavations resulting from these removal activities shall be cleaned of all loose materials, dish shaped, and widened as necessary to permit access for compaction equipment. Areas exposed by any required over-excavation should be scarified to a depth of **6",** moisture-conditioned to near optimum moisture content, and recompacted to at least **95%** of the maximum dry density.

3.04 TESTING AND OBSERVATION

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

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

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

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

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

3.05 CLEARING AND GRUBBING

A. Prior to grading, remove all debris off-site. Remove trees and brush including the root systems. Holes resulting from tree and brush removal should be prepared and backfilled in accordance with paragraphs 3.7, 3.8, 3.9, and 3.10. This may require deepening and/or widening the holes to adequately remove disturbed soil and provide room for compaction equipment. Strip the surface of all organics. Strippings meeting the requirements of Section 32 9000 may be used in landscape areas only.

3.06 CUTTING

A. Building pads that are located within a cut/fill transition area will have to be overexcavated to provide a semi-uniform fill beneath the building pad. The portions of building pads located in cut areas shall be overexcavated to provide no more than **12 inches** difference in fill placed in the same building pad.

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

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

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

3.07 STRUCTURAL EXCAVATION

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

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

C. Unsuitable Ground: Any errors in structural excavation, soft ground, or clay soils found when excavating shall be reported to Architect. In no case shall work be built on any such soft or clayey unsuitable surface without direction from the Architect. Restore excavations to proper elevation with engineered fill material compacted to **95%** of maximum dry density.

3.08 SUBGRADE PREPARATION

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

B. After clearing, grubbing and cutting, subsurface shall be plowed or scarified to a depth of at least **12”** until surface is free from ruts, hummocks or other uneven features. Moisture condition to (optimum) (2% above optimum) moisture content and recompact to at least **95%** of the maximum dry density as determined by ASTM Test Method D1557. If the existing soils are at a water content higher than specified, the contractor shall provide multiple daily aerations by ripping, blading, and/or discing to dry the soils to a moisture content where the specified degree of compaction can be achieved. After seven consecutive working days of daily aerations, and the moisture content of the soil remains higher than specified, the contractor shall notify the architect. If the existing soils have a moisture content lower than specified, the contractor shall scarify, rip, water and blade existing soil to achieve specified moisture content. The contractor shall make proper allowance in schedule and methods to complete this work.

C. After subgrade for fill within building pad area or within paved areas has been cleared, plowed and scarified, it shall be disked or bladed until uniform and free from large clods, brought to **2% above optimum moisture content** and compacted to not less than **95%**

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of maximum dry density, as determined by ASTM Test Method D1557, and such expressed percentage thereof will be minimum acceptable density for specified work.

D. Subgrade in areas to receive landscaping shall be compacted to **90%** of maximum dry density.

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

F. In building pad areas with cut/fill transitions or building pad areas, which are entirely in cut , overexcavate a minimum of **2** feet so that differential fill thickness does not exceed **1** foot over a horizontal distance of **5** feet.

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

A. Selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in compacted thickness. Each layer shall be spread evenly and thoroughly mixed to insure uniformity in moisture content. Compaction of rocky fill materials should be achieved by at least successive passes with a compactor or an equivalent self-propelled sheepsfoot compactor. Compactive effort should be applied uniformly across the full width of the fill. Large rocks that cannot be properly incorporated into the engineered fill should be removed.

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

C. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a minimum of **95%** as determined by the ASTM D1557 Compaction Test. Compact each layer over its entire area until desired density has been obtained.

D. Recompaction of Fill in Trenches and Compaction of Fill Adjacent to Walls: Where trenches must be excavated, backfill with material excavated. Place in lifts that when compacted do not exceed 6", moisture conditioned to optimum moisture content, and compact to a minimum of **95%** relative compaction in building pad and paved areas, and to **90%** relative compaction in landscape areas.

E. Jetting of fill materials will not be allowed.

3.10 FINAL SUBGRADE COMPACTION

A. Building Pads: Compaction of engineered fill, overexcavation or existing material shall be in accordance with the project soils report .After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed.

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B. Paved Areas: Upper **6**" of all final subgrades supporting pavement sections and all other flatwork shall be brought to specified moisture content and shall be uniformly compacted to not less than **95**% of maximum dry density, regardless of whether final subgrade elevation is attained by filling, excavation, or is left at existing grade. After acceptance of final compaction test, contractor shall maintain the required moisture content of subgrade until concrete flatwork is placed..

C. Other Fill and Backfill: Upper **6**" of all other final subgrades or finish grades shall be compacted to **90**% of maximum dry density.

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

3.11 PLACING, SPREADING, AND COMPACTION OF LANDSCAPE BACKFILL MATERIALS

A. All landscaped areas shall receive topsoil. After subgrade under landscape area has been scarified and brought to **90**% maximum dry density, top soil shall be placed evenly to depth of **6**" at 85% of maximum dry density.

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

3.12 SLOPE CONSTRUCTION

A. Cut slopes shall be constructed to no steeper than **2:1** (horizontal:vertical). Fill slopes shall be constructed to no steeper than **3:1** (horizontal:vertical). Prior to placement of fill on an existing slope the existing slope shall be benched. The benches shall be in a ratio of **1** horizontal to **1** vertical. The face of the fill slopes shall be compacted as the fill is placed, or the slope may be overbuilt and then cut back to the design grade. Compaction by track walking will not be allowed.

3.13 FINISH GRADING

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

B. All landscape areas shall be left free of rock or foreign material.

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

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3.14 SURPLUS MATERIAL

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

3.15 CLEANING

A. Refer to Section 01 7700.

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

END OF SECTION

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SECTION 31 23 33 – TRENCHING AND BACKFILLING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Trench backfill materials.

1.02 RELATED REQUIREMENTS

A. Section 01 5000, Temporary Facilities and Controls.

B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

C. Section 31 0000, Earthwork.

D. Section 32 8000, Irrigation.

E. Section 33 0000, Utilities

F. Section 33 4000, Storm Drainage Utilities.

1.03 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

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

1.04 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

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

1.05 ACTION SUBMITTALS

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

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For contractor / Installer.

1.07 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor’s guarantee.

1.08 QUALITY ASSURANCE

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

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

C. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.09 DELIVERY, STORAGE AND HANDLING

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

1.10 FIELD CONDITIONS

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

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

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1.11 PROTECTION

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

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

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

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

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

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

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

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

1.12 TRENCH SAFETY PROVISIONS

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

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

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

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1.13 SEASONAL LIMITS

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

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

1.14 TESTING

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

PART 2 - PRODUCTS

2.01 MATERIALS

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

1. ¾ inch crush rock **as specified on the plans.**

2. 1 ½” clean drain rock suitable for leach line or horizontal percolation drains.
3. Native Materials: Soil native to Project Site, free of wood, organics, and other deleterious substances. Rocks shall not be greater than **2**-inches.
4. Sand: Fine granular material, free of organic matter, mica, loam or clay.
5. Lean Mix Concrete: 3 sacks of cement per yard plus sand.
6. Class 2 aggregate base, ¾” rock, per Caltrans Section 26-1.02B
7. Controlled Density Fill: 3 sack slurry backfill.

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

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

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Examine areas and conditions under which work is to be performed.

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2. Identify conditions detrimental to proper or timely completion of work and coordinate with General Contractor to rectify.

3.02 INSTALLATION

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

3.03 TRENCHING

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

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

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

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

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

3.04 BACKFILL

A. Pipe Trench Backfill is divided into three zones:

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

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

C. Pipe Zone and Upper Zone Backfill:

1. Type of material and degree of compaction Pipe Zone and Upper Zone Backfill shall be as required by Drawings, Details, & Specifications.

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2. Upper Zone Backfill shall not be placed until conformance of Bedding and Pipe Zone Backfill with specified compaction test requirements has been confirmed.
3. Backfill shall be brought up at substantially the same rate on both sides of the pipe and care shall be taken so that the pipe is not floated or displaced. Material shall not be dropped directly on pipe.

D. Backfill Compaction:

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

E. Backfill in Areas Previously Lime or Cement Treated

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

3.05 TRENCH AND SITE RESTORATION

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

3.06 PROTECTION

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

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

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

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

3.07 SURPLUS MATERIAL

A. Remove excess excavated material, unused materials, damaged or unsuitable materials from site at the contractor's expense.

3.08 CLEANING

A. Refer to Section 01 7700.

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

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

END OF SECTION

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SECTION 31 12 00 – ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

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

1.02 RELATED REQUIREMENTS

A. Section 01 5000, Temporary Facilities and Controls.

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

C. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

D. Section 31 0000, Earthwork.

E. Section 31 2333, Trenching and Backfilling.

F. Section 32 8000, Irrigation.

G. Section 33 0000, Utilities.

H. Section 33 4000, Storm Drainage Utilities.

1.03 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

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

D. ASTM International (ASTM):

1. D698-00 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
2. D1556-00 Test Method for Density of Soil in Place by the Sand-Cone Method.
3. D1557-02 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
4. D6628-16 Standard Specification for Color of Pavement Marking Materials.
5. D3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

E. CALTRANS Standard Specifications.

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

1.04 ADMINISTRATION REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.05 ACTION SUBMITTAS

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

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Contractor / Installer.

B. Sustainable Design:

1. General
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.

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2. The following information shall be provided:
   a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
   b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.07 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor's guarantee.

1.08 QUALITY ASSURANCE

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

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

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

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

E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

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

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

1.09 DELIVERY, STORAGE AND HANDLING

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

1.10 FIELD CONDITIONS

A. Environmental Requirements:

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

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1.11 EXISTING SITE CONDITIONS

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

1.12 PROTECTION

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

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

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

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

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

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

1.13 SEASONAL LIMITS

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

1.14 TESTING

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

B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs

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of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

PART 2 - PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

A. Sustainable Design:

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

2.02 MATERIALS

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

B. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions where **specified on the drawings**. Soil sterilizer will only be applied in selected areas as shown on the drawings

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

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

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

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

G. Seal Coat: Seal coat shall be applied in strict accordance with manufacturer's instructions where **specified on the drawings**. Seal coat shall be a two coat application with a pre-mixed asphalt emulsion blended with select fillers and fibers such as:

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

H. Wood Headers and Stakes: Pressure treated Douglas Fir or Redwood with ½" diameter steel stakes 18" in length.

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

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

J. Precast Concrete Bumpers: 3,000 psi at 28 day minimum strength; 48" length unless otherwise indicated; provide with steel dowel anchors and concrete epoxy.

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

L. Crack Filler; QPR model CAR08, Conco Inc. Docal 1100 Viscolastic, Topeka Hot Mix crack filler or approved equal.

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

2.03 MIXES

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

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

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

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

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

PART 3 - EXECUTION

3.01 EXAMINATION

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

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3.02 PREPARATION

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

3.03 INSTALLATION

A. Headers:

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

B. Asphalt Paving:

1. Aggregate Base Course: Install in accord with State Specifications, Section 26. Compact to relative compaction of not less than 95%, ASTM D1557. The material shall be deposited on the subgrade in such a manner as to provide a uniform section of material within five percent tolerance of the predetermined required depth. Deposition will be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the subgrade shall have sufficient moisture which, in the opinion of the Architect is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted. If in the opinion of the site geotechnical engineer, the material is unsuitably segregated, it shall be removed or completely reworked to provide the desired uniformity of the material.
   a. Moisture content and compaction of base material shall be tested immediately prior to placement of asphalt paving.
2. Sterilant: Apply specified material at manufacturer's recommended rate. Applicator of sterilant material shall be responsible for determining location of all planter areas. Apply specified material over entire base course area just prior to application of asphalt. Follow manufacturer's printed directions. **Sterilant will only be applied if shown on the drawings.**
3. Liquid Asphalt Tack Coat: Apply as "tack coat" to all vertical surfaces of existing paving, curbs, walks, and construction joints in surfacing against which paving is to be placed.
4. Asphalt Concrete Surface Course:
   a. Comply with State Specifications, 39-6 except as modified below.

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1) Final gradation shall be smooth, uniform and free of ruts, humps, depressions or irregularities, with a minimum density of **95%** of the theoretical maximum specific gravity determined by California Test Method #309. Maximum variation 1/8 inch in 10' when measured with steel straightedge in any one direction. Test paved areas for proper drainage by applying water to cover area. Correct portions that do not drain properly by patching with plant mix. In no case shall accessible parking spaces or loading and unloading areas exceed 2% slope in any direction.

2) Asphalt material shall be delivered to the project site in a covered condition to maintain acceptable temperature.

5. Placement and adjustment of Frames, Covers, Boxes and Grates: The Contractor shall set and adjust to finish grade all proposed and existing frames, covers, boxes, and grates of all manholes, drop inlets, drain boxes, valves, cleanouts, electrical boxes and other appurtenant structures prior to placement of asphaltic concrete, unless they are to be raised after the asphalt pavement is installed.

6. Water Testing: All paved areas shall be water tested, to check drainage, in the presence of the project inspector prior to placement of seal coat. The surface of asphalt paving shall not vary more than 1/8 inch above or below the grade established on the plans. If variations in grade are present, they will be corrected by overlaying paving and/or pavement removal and replacement as directed by the Architect.

7. Patching: Cut existing paving square and plumb at all edges to be joined by new paving. In trenches; grind existing asphalt on each side of trench 3” wide x ½ the depth of the section. Apply tact coat to vertical surfaces before installing new work. Warp carefully to flush surface, with seal over joints, and feather edge. Sawcut, remove and patch existing paving where cutting is necessary for installation of piping or conduits under Divisions 15, 16 and 33.

8. Seal Coat:

   a. Seal coat shall be applied no sooner than 30 days from time of asphalt placement.

   b. Surface Preparation: surface shall be clean of all dirt, sand, oil or grease. Hose down entire area with a strong jet of water to remove all debris. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted asphalt concrete as specified herein. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.

   c. Crack Fill:

      1) Cracks ¼” – 1”: “Docal 1100 Viscolastic, distributed by Conoco, Inc., Elk Grove, CA, (916) 685-9253, or approved equal.

      2. Cracks greater than 1”: Hot Mix.

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d. Seal Coat Seal Application: Thoroughly mix materials in the presence of the onsite inspector. Failure to do so will be cause for rejection. Apply in accordance with manufacturer's written instructions.
   a. The minimum application rate for each applied coat shall be 30 gals per 1000 sq. ft. **Two coats of sealcoat will be required.**
   b. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.

e. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.

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

1. International Accessible Symbol: Symbol shall be white figures on a blue background. Blue shall be equal to color PMS 933C. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square. Tolerances: Apply striping within a tolerance 1/2 inch in 50 feet. Apply markings and striping to widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

D. Colors: As directed by Architect

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

3.04 CLEANING

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

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

END OF SECTION

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SECTION 32 16 00 – SITE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

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

1.02 RELATED REQUIREMENTS

A. Section 01 4523, Testing & Inspection Services.

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

C. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

D. Section 03 1000, Concrete Forming & Accessories.

E. Section 03 2000, Concrete Reinforcing.

F. Section 03 3000, Cast-in-Place Concrete.

G. Section 09 9623, Graffiti-Resistant Coatings.

H. Division 31, Earthwork.

I. Section 32 1200, Asphalt Concrete Paving.

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1.03 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CALGreen), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. American Concrete Institute (ACI):

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

D. ASTM International (ASTM):

1. A615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
2. A706/A706M: Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
3. C33/C33M: Standard Specification for Concrete Aggregates.
4. C94/C94M: Standard Specification for Ready-Mixed Concrete.
5. C143/C143M: Standard Test Method for Slump of Hydraulic-Cement Concrete.
6. C150C150M: Standard Specification for Portland Cement.
7. C260/C260M: Standard Specification for Air-Entraining Admixtures for Concrete.
8. C309: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
9. C330/C330M: Standard Specification for Lightweight Aggregates for Structural Concrete.
10. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
11. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
12. C920: Standard Specification for Elastomeric Joint Sealants.

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13. C1107/C1107M: Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
14. C1315: Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
15. D1751: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
16. D5893/D5893M: Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.

E. Concrete Reinforcing Steel Institute (CRSI):

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

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

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

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

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

1.04 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

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1.05 ACTION SUBMITTALS

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

B. Product Data:

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

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

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

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

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

C. Sustainable Design:

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1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.
   b. Sustainable design submittals are in addition to other submittals.
2. The following information shall be provided:
   a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.
   b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.07 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor’s guarantee.

1.08 QUALITY ASSURANCE

A. Qualifications:

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

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

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

D. Use only new materials and products.

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

F. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

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

1. Cement and reinforcing shall be tested in accordance with CBC Section 1910A. Testing of reinforcing may be waived in accordance with Section 1910A.2 when approved by the Engineer and DSA.

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2. Testing will be performed by an independent testing and inspecting agency in accordance with Section 01 4523, Testing and Inspection Services, and paid for by the Owner.
3. Refer to Article FIELD QUALITY CONTROL in Part 3 of this Section for additional requirements.
4. Cost of retests and coring due to low strength or defective concrete will be paid by the Owner and back-charged to the Contractor.

H. Sieve analysis from testing laboratories identifying rock/sand percentages within the concrete mix; or class 2 aggregate base shall have the current Project name and Project location identified on the report. Outdated analytical reports greater than 90 days old will not be accepted.

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

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

1.09 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.

C. Transport, store and handle in strict accordance with the manufacturer's written recommendations.

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D. Store cement in weather tight building, permitting easy inspection and identification. Protect from dampness. Lumpy or stale cement will be rejected.

E. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregate. Use only one supply source for each aggregate stock pile.

1.10 FIELD CONDITIONS

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

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

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

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

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

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

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

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

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1. When placing concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F.
2. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened.
3. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

PART 2 - PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

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

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

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

C. Sustainable Design:

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

2.02 FORMING MATERIALS

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

1. Concrete Exposed to View: 5/8-inch minimum APA B-B Plyform, steel or “Sonotube” forms by Sunoco, 888-875-8754, or equal.

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2. Concrete Concealed from View: 5/8-inch minimum APA B-B Plyform, steel or 1 x 8 DF, Number 2 Grade or better.

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

C. Spreaders: Metal. Wood is not permitted.

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

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

2.03 REINFORCING MATERIALS

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

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

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

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

2.04 CONCRETE MATERIALS

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

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

1. Normal Weight Aggregates: Clean and free from deleterious coatings, clay balls, roots, and other extraneous materials, and in conformance with ASTM C33/C33M, except as otherwise specified. Combined grading shall meet limits of ASTM C33/C33M.

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a. Size: Not be larger than one-fifth of the narrowest dimension between forms, or larger than three-fourths of the minimum clear spacing between reinforcing bars.

2. Lightweight Aggregates:

a. General: Durable particles suitably processed, washed and screened without adherent coatings, free of materials with deleterious reactivity to alkali in cement, and conforming to ASTM C330/C330M.

b. Fine aggregate shall be natural sand, or sand prepared from stone or gravel, with grains free of silt, loam and clay.

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

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

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

E. Exposed Aggregate **(only where shown on the plans):** Black and white, washed, 3/8-inch pea gravel conforming to ASTM C33/C33M as distributed by Harold Smith & Sons, St. Helena, CA, 707-200-7342, or equal.

1. Exposed aggregate, when used, shall replace the 1 inch maximum size aggregate described in the Class B concrete mix design.
2. Provide 1,300 pounds of exposed aggregate per cubic yard of concrete.
3. Following placement and finishing, utilize specified surface retarder.

2.05 ADMIXTURES

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

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

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

1. Proportion air entraining concrete to attain specified minimum 28-day compressive strength.

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2. Total air entrainment in concrete shall be not less than 4 percent or more than 6 percent of the volume of concrete.

C. Glare Reduction Colorant: Concentrated pigment dispersions designed to permanently color concrete; “Chromix L10 Base-Black” by Sika Corporation, or equal. *Was within 2.2 H.1*

D. Coloring Agent for Integrally Colored Concrete **(where shown on the drawings**): Weather resistant, UV stable, lightfast, and alkali resistant free-flowing concentrated pigment granules designed to permanently color concrete; Scofield “Chromix G” (granular) / “Chromix L” (liquid) by Sika Corporation, or equal.

1. Colors: As selected by Architect from manufacturer’s full range of standard colors.

2.06 CURING MATERIALS

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

B. Colored Curing Compound **(where shown on the drawings)**: Scofield “Lithrochrome Colorwax Concrete Curing Compound” by Sika Corporation or equal meeting ASTM C309 for liquid membrane curing compounds.

1. Color: To match selected coloring agent additive.

2.07 SURFACE TREATMENTS

A. Surface Retarder for Exposed Aggregate Finish: “Rugasol-S” by Sika Corporation, “Top-Cast” by GCP Applied Technologies, or equal.

B. Concrete Stain**(where shown on the drawings)** : High performance, low-odor, reactive polymer; Scofield “Lithochrome Tintura Stain” by Sika Corporation, or equal.

1. Colors: As selected by Architect.

C. Heavy Duty Color Hardener **(where shown on the drawings)**: Heavy duty abrasion resistant dry shake color hardener comprised of specialty aggregates; Scofield "Emerchrome SC Color Hardener” by Sika Corporation, or equal.

1. Colors as selected by Architect.

D. Sealer for Stained Concrete **(where shown on the drawings)**: High-solids, low-odor, self-crosslinking, abrasion resistant, urethane fortified acrylic; Scofield “SelectSeal Plus: by Sika Corporation, or equal.

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1. Colors: To be selected by Architect from standard colors.

2.08 ADDITIONAL MATERIALS AND COMPONENTS

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

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

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

C. Non-Shrink Grout: Premixed, non-metallic, no chlorides, non-staining and non-shrinking conforming to ASTM C1107/C1107M; “MasterFlow 713” by Master Builders Solutions, a division of BASF, 800-433-9517, or equal.

D. Drainage Rock Base **(where shown on the drawings)**: clean free-draining crushed rock as recommended by the Geotechnical Engineer.

E. Aggregate Base **(where shown on the drawings)**: 3/4-inch aggregate base conforming to Class 2 Aggregate Base as defined in Caltrans Standard Specifications Section 26.

F. Expansion Joint Material: Preformed 3/8-inch fiber material, with bituminous binder manufactured for use as concrete expansion joint material and conforming to ASTM D1751 and approved by Architect.

1. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint-filler sections together.

G. Joint Sealant for Expansion Joints in Concrete: Weather and UV resistant, single component, cold applied silicone sealant, Type S, conforming to ASTM D5893/D5893M; ASTM C920, Grade P, Class 25, Use T.

1. Self-Leveling: “DOWSIL 890-SL Silicone Joint Sealant” by Dow Chemical Company, or equal.
2. At Slopes Exceeding 5 Percent: Non-sagging; “DOWSIL 888 Silicone Joint Sealant” by Dow Chemical Company, or equal.
3. Color: As standard with manufacturer.

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H. Pre-Formed Plastic Expansion Joint Caps: Polystyrene, with removable tops; “Snap Cap” by W. R. Meadows, Tex-Trude expansion caps, or equal.

I. Truncated Domes: Vitrified Polymer Composite (VPC) cast-in-place detectable/tactile warning surface tiles complying with Americans with Disabilities Act (ADA) and the California Code of Regulations (CCR) Title 24, Part 2, Chapter 11B; “Armor-Tile”, “Access Tile Tactile Systems,” or equal.

1. Color: Shall be yellow and approximate 33538 of GSA/SAE AMS-STD-595A in accordance with CBC Section 11B-705.1.1.3.1.

J. Traffic Paint for Accessibility Striping at Stairs: VOC compliant, water-based, vinyl acrylic copolymer fast drying emulsion and specifically formulated as a traffic marking paint; “Setfast” with “Duckback” abrasive additive by Sherwin-Williams, “SAFE-STRIDE” by Wooster Products, Inc., or equal.

1. Colors: As selected by Architect

2.09 CONCRETE DESIGN AND CLASS

A. Designed Strength and Classes of Concrete: The following mixes are not applicable to concrete items exceeding 4 feet in height above the adjacent grade.

1. Class “B”: Concrete shall have 1 inch maximum size aggregate, shall have 3,000 pounds per square inch minimum at 28 day strength with a maximum water to cementitious ratio no greater than 0.50.
   a. Location of Use: Exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb and gutter, and other concrete of like nature.
2. Class "D" concrete of 1 inch maximum size aggregate shall have 3500 pounds per square inch 28 day strength with a maximum water to cementitious materials ratio of 0.55.
   a. Location of Use: Footings and retaining walls not attached to buildings, and planter walls, monument signs, and other site concrete not described for use in Class “B”.

B. Slump Limits: Provide concrete, at point of final discharge of proper consistency as tested in accordance with ASTM C143/C143M with slumps of 4 inches, plus or minus 1 inch.

C. Mix Design: Concrete shall be designed for strength in accordance with provisions of CBC Section 1905A.

1. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review.

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2. Fly ash may be used in concrete to improve workability in amounts up to 15 percent of the total cementitious weight.

D. Air Entrainment: Provide at concrete paving / flatwork, including concrete ramps and stairs in accordance with local jurisdiction minimum requirements, but no less than 3 percent of the volume of concrete.

E. Glare Reduction Additive:

1. General:
   a. Provide at exterior concrete slabs, walks, ramps, stairs, including bleachers, and other exposed flatwork to eliminate glare.
   b. Omit glare reduction colorant where color hardener, integral color, and stain treatment of concrete are scheduled.
2. Quantity: As required to match approved sample but not exceed 2 pounds of colorant per cubic yard of concrete.
3. Add colorant to mix in accordance with manufacturer's printed instructions.

F. Coloring Agent:

1. Quantity: Add pigment as required to result in hardened concrete color consistent with approved sample but not exceeding maximum dosage per sack of cement as recommended by manufacturer based on total cementitious materials of mix design.
2. Add pre-mixed colorant bags to mix in accordance with manufacturer's printed instructions.

2.10 MIXING OF CONCRETE

A. Conform to requirements of CBC Chapter 19A.

B. Concrete shall be mixed until there is uniform distribution of material and mass is uniform and homogenous; mixer must be discharged completely before the mixer is recharged.

C. Concrete shall be Ready-Mixed Concrete: Mix and deliver in accordance with the requirements set forth in ASTM C94/C94M and ACI 301. Batch Plant inspection may be waived in accordance with CBC Section 1705A.3.3, when approved by the Project Engineer and DSA.

1. Furnish batch certificates for each batch discharged and used in the work.
2. Approved Testing Laboratory shall check the first batching at the start of the work and furnish mix proportions to the Licensed Weighmaster.

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3. Licensed Weighmaster shall identify materials as to quantity and to certify to each load by ticket.
4. Delivery tickets are to accompany each truck and shall be kept in the job superintendent's file. Delivery tickets must indicate the following information or be subject to rejection:
    a. Name of Project.
    b. Supplier of concrete.
    c. Truck identity and ticket serial number.
    d. Date of delivery.
    e. Brand of cement.
    f. Cement content.
    g. Strength classification.
    h. Batching time.
    i. Point of deposit.
    j. Total amount of water.
    k. Weight of aggregate.
    l. Daily temperature.
    m. Number of cubic yards in load.
    n. Admixture content.
    o. Name of Contractor.
    p. Name of driver.
    q. Time loaded and first mixing of concrete.
    r. Reading of revolution counter.
    s. Color additive.
5. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt, and will transmit two copies of record to DSA.
6. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished is in conformance with proportions established by mix designs.
7. Placement of concrete shall occur as rapidly as possible after batching and in a manner which will assure that the required quality of the concrete is maintained. In no case may concrete be placed more than 90 minutes from batch time.
    a. When air temperature is between 85 and 90 degrees F, reduce maximum batching to discharge time from 90 minutes to 75 minutes.
    b. When air temperature is above 90 degrees F, reduce maximum batching to discharge time to 60 minutes.
8. Water may be added to the mix only if neither the maximum permissible water-cement ratio nor the maximum slump is exceeded.

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a. The quantity of water used for each batch shall be accurately measured.

b. In no case shall more than 10 gallons of water be added to a full 9-yard load, or 1 gallon per yard on remaining concrete within the drum, providing load tag indicates at time of mixing at plant an allowance for additional water.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Confirm general layout, grade, and joint pattern layout with the Architect prior to placing concrete.

B. Verify that gradients and elevations of the base are correct, and that the base is dry.

C. Contractor shall report in writing to the Architect prevailing conditions that will adversely affect satisfactory execution of the work of this Section.

1. Do not proceed with work until unsatisfactory conditions have been corrected.

D. Forms and reinforcements are subject to approval by the Project Inspector as specified in Article FIELD QUALITY CONTROL.

3.02 PREPARATION

A. Remove frost, water, and other foreign materials from form surfaces, reinforcement, and embedded items against which concrete will be placed.

B. When the ambient temperature necessitates the use of cold or hot weather concreting, make provisions in advance of concrete placement.

C. Before placing concrete, clean tools and equipment, and remove debris from areas to receive concrete.

D. Clean reinforcing and other embedded items of coatings, oil, mud and soil that may impair bond with concrete.

E. Slab-On-Grade: After subgrade has been approved by Geotechnical Engineer, install specified drainage rock base material to thickness shown. Rock base shall be implemented and compacted in accordance with the Geotechnical Report and recommendations of the Geotechnical Engineer.

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3.03 INSTALLATION – FORMWORK

A. Form material shall be straight, true, sound and able to withstand deformation due to loading and effects of moist curing. Materials which have warped or delaminated, or require more than minor patching of contact surfaces, shall not be reused.

B. Build forms to shapes, lines, grades and dimensions indicated. Construct formwork to maintain tolerances required by ACI 301. Forms shall be substantial, tight to prevent leakage of concrete, and properly braced and tied together to maintain position and shape. Butt joints tightly and locate on solid backing. Chamfer corners where indicated. Form bevels, grooves and recesses to neat, straight lines. Construct forms for easy removal without hammering, wedging or prying against concrete.

C. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

D. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.

E. Build in securely braced temporary bulkheads, keyed as required, at planned locations of construction joints.

F. Before placement of reinforcing steel, coat faces of all forms to prevent absorption of moisture from concrete and to facilitate removal of forms. Apply specified material in conformance with manufacturer's written directions.

1. Seal all cut edges.
2. Before re-using form material, inspect, clean thoroughly, and recoat.

G. Slope tie-wires downward to outside of wall.

H. Brace, anchor and support all cast-in items to prevent displacement or distortion.

I. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.

J. Concrete Paving, Curbs, Curb and Gutters, Ramps:

1. Expansion Joints: Install at locations indicated, and so that maximum distance between joints is **20** feet for exterior concrete unless otherwise shown. Expansion

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joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.

2. Curbs, Valley Gutter, and Curb & Gutter: Install expansion joints at **60** feet on center, except when placing adjacent to concrete walks, the expansion joints shall align with the expansion joints shown for the concrete walks. Expansion joint material shall be full depth of concrete section. Recess for snap cap and sealant when required.
3. Isolation Joints: 3/8-inch felt between walls and exterior slabs or walks so that paved areas are isolated from all vertical features, unless specifically noted otherwise on plans.
4. Exterior Concrete Paving: Install expansion joints at **20** feet on center maximum, both directions, unless shown otherwise on plans.
5. Ramps: Whether shown or not, all ramps shall have control joints and expansion joints.
   a. Control joints on ramps shall be aligned and placed in between the vertical posts for the handrails. The curbs, if required shall have control joints that align with the handrail posts.
   b. Expansion joints shall be placed at the upper, intermediate, and bottom landings.

K. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.04 INSTALLATION – REINFORCING

A. General: Reinforcing shall be accurately placed at locations indicated on the drawings within required tolerances and providing required clearances. Reinforcement shall be secured prior to placement of concrete such that tolerances and clearances are maintained. Coverage shall be in accordance with Section 1907A.7 of the CBC.

1. Reinforcement must be in place before concreting is begun.
2. Keep a person on the job to maintain position of reinforcing as concrete is placed.
3. All expansion and construction joints in concrete shall have dowels of size and spacing as shown on the Drawings, or as approved by Architect.
4. Give notice whenever pipes, conduits, sleeves, and other construction interferes with placement; obtain method of procedure to resolve interferences.

B. Additional reinforcing steel shall be placed around all utility boxes, valve boxes, manhole frames and covers that are located within the concrete placements.

1. The bars shall be placed so that there will be a minimum of 1-1/2-inch clearance and a maximum of 3-inch clearance. The reinforcing steel shall be placed mid-depth of concrete slab.

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C. At right angles or intersections of concrete walks, additional 2 feet x 2 feet #5, 90 degree bars shall be added at all inside corners for additional crack control. The bars shall be placed 2 inches from concrete forms and supports, at mid-depth of slab.

D. Reinforcing steel shall be adequately supported by approved devices on centers close enough to prevent any sagging.

E. Placing Tolerances:

1. In accordance with ACI 301 or CRSI/WCRSI Recommended Practice for Placing Reinforcing Bars, unless otherwise shown.
2. Clear distance between parallel bars in a layer shall be no less than 1 inch, the maximum bar diameter shall not exceed 1-1/2 times the maximum size of coarse aggregate.

F. Splices:

1. General: Unless otherwise shown on drawings, splice top reinforcing at midspan between supports, splice bottom reinforcing at supports, and stagger splices. Bar laps shall be wired together. Reinforcing steel laps shall be as follows:
   a. Length of Lap Splices in Concrete:
      1) No. 4 bar: 24 inches minimum.
      2) No. 5 Bar: Not less than 62 bar diameters.
      3) No. 6 Bar: 56 inches minimum.
      4) No. 7 Bars and Larger: Not less than 93 bar diameters.
   b. All splices shall be staggered at 5 feet minimum from adjacent splices.

G. Inspection: Refer to Article FIELD QUALITY CONTROL.

3.05 PLACING OF CONCRETE – GENERAL

A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to Owner.

B. Remove wood chips, sawdust, dirt, loose concrete and other debris just before concrete is to be poured. Use compressed air for inaccessible areas. Remove all standing water from excavations.

C. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as

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practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.

D. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.

E. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to exceed **4'-0"** in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.

F. Remove form spreaders as placing of concrete progresses.

G. Place footings as monolithic and in one continuous pour.

H. Compacting: Concrete shall be compacted by mechanical vibrators.

1. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
2. Vibrating shall not be applied to concrete which has already begun to initially set or be continued so long as to cause segregation of materials.

3.06 REMOVAL OF FORMS

A. Remove without damage to concrete surfaces.

1. Sequence and timing of form removal shall insure complete safety of concrete structure.
2. Forms shall remain in place for not less than the following periods of time. These periods represent cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.
   a. Vertical Forms of Foundations, Walls and All Other Forms Not Covered Below: 5 days.
   b. Concrete Paving Edge Screeds or Forms: 7 days.
3. Concrete shall not be subjected to superimposed loads (structure or construction equipment) until it has attained its full design strength and not for a period of at least 21 days after placing. Concrete systems shall not be subjected to construction loads in excess of design loads.

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B. Patching: Install specified patching mortar per manufacturer's recommendations. Repairs to defective concrete which affect the strength of any structural concrete member or component are subject to approval by the architect and DSA.

3.07 CONCRETE PAVING

A. Concrete paving shall be formed and finished to required line and grades true and flat with a maximum tolerance of 1/8-inch in 10 feet for flatness and to slopes indicated.

B. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.

C. Thoroughly water and soak the concrete paving subgrade as required to achieve required moisture content prior to the concrete pour**.**

D. Construction Joints:

1. Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting.
2. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.08 INTEGRALLY COLORED CONCRETE

A. Maintaining consistent color in integrally colored concrete is required.

1. The Contractor shall coordinate with its concrete producer to review color additive manufacturer's recommendations for best practices to be followed including necessary crew size, tools, and batch-to-batch color consistency.
2. No water is to be added while the ready-mix truck is in transit and no clean-out water is to be left in trucks which may result in change in color.
3. The same type and brand of cement, sand and aggregates shall be used in each batch of concrete.

B. Mix Design: Additives and accelerator, if required, that contain calcium chloride are not permitted.

C. Curing shall be performed with color-matched curing compound.

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D. Follow additional requirements used to prepare the approved site mockup.

3.09 FINISHING

A. Concrete Paving: Finish surface as required by ACI 302.1R using manual and vibrating screeds to place concrete level and smooth.

1. Under no circumstances shall water be added to the top surface of freshly placed concrete.
2. Use “jitterbugs” or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness.
3. After tamping the concrete, wood float surface to a true and even plane.
4. After floating with a wood bull float, make 2 passes with a steel Fresno trowel to start sealing the concrete surface.
5. While concrete is still wet but sufficiently hardened to bear a persons’ weight on knee boards, start troweling with a steel hand trowel or a machine trowel in larger areas. Use sufficient pressure to bring moisture to surface.
6. After surface moisture has disappeared, finish concrete utilizing steel, hand or power trowel.
7. Completed surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8-inch in 10 feet.
8. Provide final finish as follows, unless otherwise indicated:
    a. **Medium Broom Finish**: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.

B. Curb Finish: Steel trowel with light broom finish.

C. Joints and Edges:

1. Mark-off exposed joints, where indicated, with 1/4-inch radius x 1 inch deep jointer or edging tool. Joints shall be clean, cut straight and parallel or square with respect to concrete walk edge.
2. Tool edges of control joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces. Expansion joints shall be constructed as detailed on plans.
3. The expansion joints shall be full depth as shown in the Drawings. Failure to do so will result in non-compliance and shall be immediately machine cut by the Contractor at its expense.

D. Exposed Concrete Surface Finishing, Not Including Top Surface of Flatwork:

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1. Remove fins and rough spots immediately following removal of forms from concrete which is to be left exposed. Damaged and irregular surfaces and holes left by form clamps and sleeves shall be patched with grout.
2. Tie wires are to be removed to below exposed surface and holes pointed up with neat cement paste similar to procedure noted under "After patching" in subparagraph below.
    a. Removal of tie wires shall extend to distance of 2 inches below established grade lines.
    b. Ends of tie wires shall be cut off flush at other, unexposed locations.
    c. Care shall be taken during pointing to match adjacent finishes of exposed concrete surface.
3. After patching, concrete that is to remain exposed shall be sacked with a grout mixture of 1-part cement, 1-1/2-parts fine sand and sufficient water to produce a consistency of thick paint.
    a. After first wetting the concrete surface, apply mixture with a brush and immediately float entire surface vigorously using a wood float. Keep damp during periods of hot weather.
    b. When set, excess grout shall be scraped from wall with edge of steel trowel, allowed to set for a time, then wiped or rubbed with dry burlap.
    c. Entire finishing operation of an area shall be completed on the same day. This treatment shall be carried to 4 inches below grade, and all patching and sacking shall be done immediately upon removal of the forms.

E. Stair Treads and Risers: Tool exterior stair tread and landing nosings to comply with ADA and CBC accessibility requirements and as detailed.

1. Nosings shall contain no pockets, voids or spalls. Patching is not allowed. Damaged nosings shall be replaced.
2. [Provide a contrasting striping consisting of Painted grooves at leading edge area of every tread and landing in compliance with CBC Section 11B-504.4.1.]

3.10 APPLICATION OF COLOR HARDENER

A. General:

1. Comply with approved manufacturer’s application instructions summarized in this Article.
2. Protect adjacent paving and planting areas during the coloration process.

B. Coordinate mix design and finishing of concrete with application requirements for color hardener.

1. Concrete mix itself must have enough water to bleed to the surface when placed but with water completely absorbed when the concrete reaches its initial set.

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2. Apply product when a thumbprint can still indent the surface, and kneeboards and application of the hardener will not alter flatness.
3. Do not apply while bleed water is still rising or a layer of water may become trapped beneath the surface.

C. Rate: As recommended by manufacturer for respective service environment and selected color.

D. Apply color hardener evenly to wet plastic surface by dry-shake method.

1. Apply 1/2 of the desired dose of hardener across the surface of the concrete using an underhand or side arm motion taking care to ensure even distribution.
2. Hand or power float the hardener into the concrete surface then broadcast the remaining material from a different direction than the first to eliminate bare spots.
3. Heavy doses to meet approved appearance may require three broadcast and float cycles.
4. Floating must be thorough and complete so all hardener is wet-out, and completely worked into and bonded with the partially set concrete.

E. Complete final finishing with hand or machine trowels. Do not wet tools or color alteration will result. Avoid overuse of hard steel tools that may burnish the surface and alter color.

F. Apply a coat of curing compound after final finish to prevent cracking due to premature surface drying and shrinkage. Curing compound shall be clear or color matched to comply with method used on approved mockup.

3.11 APPLICATION OF SURFACE RETARDER FOR EXPOSED AGGREGATE FINISH

A. General: Comply with approved manufacturer’s application and removal instructions summarized in this Article.

B. Shake product container well before application.

C. Apply uniformly to the wet concrete after the initial bleed water rises to the surface.

D. Spray with a low-pressure sprayer until the surface has a complete hiding coat. Do not apply too sparingly.

1. Use water for clean-up.
2. Allow 1-2 hours to dry.

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E. For removal, wash away the retarded cement matrix the next day, using high-pressure water unless mix design, use of lightest etch, and ambient temperatures deem it necessary to remove the retarded matrix the same day to achieve appearance of approved mockup.

1. Exercise care, and install protective procedures, to prevent rinse water from damaging adjacent materials or entering adjacent soil and planting areas.
2. Should rinse water contaminate soil of planting areas, affected soil shall be removed and replaced with new soil at no additional cost to Owner

3.12 CURING

A. Formed Concrete:

1. Keep forms and top on concrete between forms continuously wet until removal of forms, 7 days minimum.
2. Maintain exposed concrete in a continuous wet condition for 14 days following removal of forms.

B. Concrete Paving, Curb, Curb and Gutter, Valley Gutter:

1. Cure utilizing curing compound. If applicable, the Contractor shall verify that the approved curing compound is compatible with the approved colorant system.
2. Curing compound shall be applied in a wet puddling application. Spotty applications shall be reason for rejection and possibly concrete removal and replacement at the contractor's expense with no compensation from the Owner.

C. No curing compound shall be applied to areas scheduled to receive resilient track surface including, curbs, ramps, runways, and similar items.

3.13 DEFECTIVE CONCRETE

A. General:

1. Determination of defective concrete shall be made by the Architect or Engineer whose opinion shall be final in identifying areas to be replaced, repaired or patched.
2. As directed by Architect, cut out and replace defective concrete.
   a. Defective concrete shall be removed from the site.
   b. No patching is to be done until surfaces have been examined by Architect and permission to begin patching has been provided.
   c. Permission to patch an area shall not be considered waiver of right by the Owner to require removal of defective work, if patching does not, in opinion of Architect, satisfactorily restore quality and appearance of surface.

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d. Remove and replace concrete if repair to an acceptable condition is not feasible.

B. Defective Concrete Is:

1. Concrete that does not match the approved mix design for the given installation type.
2. Concrete not meeting specified 28-day strength.
3. Concrete which contains rock pockets, voids, spalls, transverse cracks, exposed reinforcing, or other such defects which adversely affect strength, durability or appearance.
4. Concrete which is incorrectly formed, out of alignment or not plumb or level, or outside of the maximum tolerance for flatness and slopes indicated.
5. Concrete containing embedded wood or debris.
6. Concrete having large or excessive patched voids which were not completed under Architect's direction.
7. Concrete not containing required embedded items.
8. Concrete with excessive shrinkage, transverse cracking, crazing, curling; or defective finish.
9. Concrete that is unsuitable for placement or has set in truck drum for longer than 90 minutes from the time it was batched.
10. Concrete where expansion joint filler that is not isolating the full depth of the concrete section, and not recessed as required for backer rod and sealant where required.
11. Concrete that is excessively wet or excessively dry and will not meet the minimum or maximum slump required per mix design.
12. Finished concrete with oil stains from equipment use, and or rust spots that cannot be removed.
13. Concrete with control joints (weakened planed joints) that do not meet the required minimum depth shown on the drawings.
14. Concrete not meeting slip-resistance requirements.

C. Flatwork: The Owner reserves the right to survey the flatwork, to determine if flatwork is outside of the maximum tolerance for flatness and slopes as indicated.

1. If the flatwork is found to be out of tolerance, then the Contractor is required to replace concrete at no additional expense to the Owner.
2. Determination of flatwork flatness, surveying and remedial work must be completed far enough in advance so that the project schedule is maintained, delays are avoided, and the new flatwork or flatwork repairs are properly cured.
3. The Contractor will be responsible for reimbursing the Owner for costs associated with re-surveying to verify compliance of work remediated by the Contractor.

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3.14 STAINING CONCRETE FLATWORK

A. Surface Preparation Prior to Staining and Sealing:

1. Allow concrete to cure prior to application of stain or sealer.
2. Surfaces shall be cleaned and free of dust, joint treatment droppings, grease, oil, and other foreign matter which would prevent necessary penetration and subsequent reaction of the stain solution with concrete surface.
3. Comply with stain and sealer manufacturer's recommendations for methods to be used for cleaning each type of contaminant.
4. Test for moisture content to ensure that surface is sufficiently dry.

B. Curing:

1. Concrete to receive stain shall be cured with new and unwrinkled, non-staining curing paper. Do not use curing compounds. Do not overlap paper.
2. Allow to cure in accordance with recommendations of stain manufacturer prior to application of stain. Curing time may vary based on selected colors.
3. If required to achieve selected color, cure concrete with specified colored curing compound in lieu of curing paper.

C. Preparation After Curing:

1. Surfaces shall be cleaned and free of dark alkali spots, grease, oil, soap, and other foreign matter which would prevent necessary penetration and subsequent reaction of the stain solution with concrete surface to be stained.
2. Comply with stain manufacturer's recommendations for methods to be used for cleaning each type of contaminant. Cleaning methods shall include pressure washing of non-flatwork and rotary machine cleaners for flatwork as required.

D. Application of Stain:

1. Apply in accordance with the manufacturer's instructions. Apply in two coats, unless only one coat is required over color hardener to achieve selected color.
2. Verify manufacturer's recommended drying time between coats.
3. After second coat of stain has dried, remove residue salts from surface by wet scrubbing with a stiff brush and flushing with clean water until rinse water runs clear. Protect surrounding areas and construction from damage by runoff.
4. Provide traffic barriers to recirculate construction traffic. Surfaces shall be allowed to dry without covering.

E. Stained slab shall be allowed to dry completely and shall be tested for dryness acceptable to sealer manufacturer prior to application of sealer. Do not proceed until concrete meets dryness requirements.

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F. Final Sealer:

1. Use either clear or colored sealer as required to achieve accepted colors. Apply two coats of sealer to properly dried stain coats in accordance with manufacturer's instructions. Sealer shall be spray applied and rolled.
2. Follow manufacturer's recommended time between coats.
3. Provide dust control in area of concrete toppings for the first 48 hours after application of sealer. No carpentry or gypsum board work shall be done during this period.
4. Verify with sealer manufacturer the use of Kraft paper covering of sealer as the work progresses. Protective covering shall be applied only after manufacturer recommends product "off-gassing" is finalized. Premature covering may contribute to a finish that looks "cloudy."
5. Heavy equipment, scaffolding, or other activity which may damage surface shall not be allowed on the surface until sealer is fully cured.

3.15 INSTALLATION OF TRUNCATED DOMES

A. General:

1. Comply with manufacturer’s installation instructions as summarized in the Article.
2. Verify concrete to receive embedded truncated dome tiles is within the slump range recommended by tile manufacturer to permit placement without mix causing tiles to float.
3. Maintain factory-installed plastic sheeting during installation process to prevent splashing of concrete onto the finished surface of the tile.
4. If necessary to ensure that adjacent tiles are flush to each other during the installation process, bolt tiles together using 1/4 inch or equivalent hardware or other methods recommended by tile manufacturer.

B. The concrete shall be poured and finished true and smooth to the required dimensions and slope prior to the tile placement. Immediately after finishing concrete, the electronic level should be used to check that the required slope is achieved.

C. Installing Tiles:

1. Install tiles into fresh concrete using techniques that will eliminate air voids under the tile.
   a. Holes in the tile perimeter allow air to escape during the installation process.
   b. Allow concrete to flow through holes in embedment flanges on underside of tile to lock tile solidly into the cured concrete.
2. Tiles shall be placed true and square.

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3. Tiles shall be tamped or vibrated into the fresh concrete to ensure that the field level of the tile is flush to the adjacent concrete surface to permit proper water drainage and eliminate tripping hazards between adjacent finishes.

D. Immediately after placement, the tile elevation shall be checked with the elevation and slope permitting water drainage, to ensure that the field surface of the tile is flush with the surrounding concrete, and that no ponding is possible on the tile.

E. While concrete is still workable, a 3/8 inch radius edging tool shall be used to create a finished edge of concrete, then a steel trowel shall be used to finish the concrete around the tile's perimeter, flush to the field level of the tile.

F. If necessary, adjust tile before the concrete sets. Use two suitable weights of 25 pounds each if necessary to ensure solid contact of the underside of tile to concrete.

G. During and after the tile installation and the concrete curing stage, prohibit walking, leaning, or placing of other external forces on tile that may rock the tile causing a void between the underside of tile and concrete.

H. After concrete is cured, remove factory-applied protective plastic wrap and concrete that may have bled under the plastic following procedures recommended by the tile manufacturer.

I. Protect tiles after installation and during remainder of construction period.

J. Prior to Owner acceptance, clean tiles complying with manufacturer's procedures for cleaning of tile surface.

3.16 SEALANT

A. Apply sealant in compliance with manufacturer's instructions, using hand guns or pressure equipment with proper nozzle size, on clean, dry, properly prepared substrates.

B. Force sealants into joint against sides of joint to make uniform. Avoid pulling of the sealant from the sides. Fill sealant space completely with sealant.

C. Finished joints shall be straight, uniform, smooth, and neatly finished.

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D. Remove any excess sealant from adjacent surfaces of joints utilizing the manufacturer's recommended solvent and cleaning processes. Leave the work in a neat, clean condition.

3.17 FIELD QUALITY CONTROL

A. Inspection of Forms and Reinforcing:

1. Approval of forms and reinforcing steel must be received from Project Inspector prior to pouring concrete.
2. Notice of readiness to place first pour shall be given to Project Inspector, DSA, Architect, and Engineer not less than 48 hours prior to placement of concrete to allow for inspection.
3. Pouring of concrete shall not proceed prior to completing requested adjustments to forms and reinforcing and without approval of Project Inspector.

B. Testing of Concrete:

1. Frequency and Samples for Testing:
   a. Four identical cylinder samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards of concrete, or not less than once for each 2,000 square feet of surface area for slabs or walls.
   b. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.
2. Testing:
   a. Slump: Each truck’s concrete shall be tested for slump before concrete is placed.
   b. Strength:
      1) Tests for strength will be conducted by Testing Agency on one cylinder at 7 days and two cylinders at 28 days. The fourth remaining cylinder will be available for testing at 56 days if the 28-day cylinder test results do not meet the required design strength.
      2) On a given project, if the total volume of concrete is such that the frequency of specified testing would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.

C. Slip-Resistance Testing: Owner’s Testing Agency will perform testing on flatwork to verify compliance with specified slip-resistance.

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1. The coefficient of friction will be measured by California Test 342 before pavement is opened to public traffic, but not sooner than 7 days after concrete placement
2. Where paving is determined to have a coefficient of friction less than 0.30, Contractor is to repair and/or replace these surfaces at no cost to Owner.

3.18 CLEANING

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

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

C. Power wash concrete surfaces to remove stains, dried mud, tire marks, and rust spots.

D. Comply with any additional requirements of additive manufacturer for colored concrete.

3.19 PROTECTION

A. Graffiti-resistant Coating:

1. Surface Preparation: Prepare concrete surface to receive graffiti-resistant coating specified in Section 09 9623, Graffiti-Resistant Coatings, where indicated.
2. Concrete must be clean, dry, and free of efflorescence and dust.

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

C. In the event of damage during construction, make all repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

END OF SECTION

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SECTION 32 17 25 - PAVEMENT COATINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Painted coatings applied to asphalt paving and concrete surfaces including, but not limited to, the following:
      a. Play areas.
      b. Sports courts.

1.02 ACTION SUBMITTALS

A. Product Data: Include technical data and tested physical and performance properties.

B. Shop Drawings:
   1. Indicate pavement coatings, colors, lane separations, and dimensions to adjacent work.
   2. Indicate layout, colors, widths, and dimensions of game lines and graphics.

1.03 FIELD CONDITIONS

A. Environmental Limitations: Proceed with pavement coating only on clean, dry surfaces and at a minimum ambient or surface temperature of as recommended by manufacturer.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1. GAF.

B. Source Limitations: Obtain pavement coating paints from single source from single manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. Slip Resistance, Coefficient of Friction: Provide products with the following values as determined by testing identical products in accordance with the following:

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1. Level Surfaces, Dry and Wet: DCOF of not less than 0.55 in accordance with ANSI A326.3.

2.03 PAVEMENT COATING SYSTEM

A. Pavement Coating System: Two-component advanced waterborne epoxy-modified acrylic.
   1. Basis-of-Design Coating System: GAF; Streetbond Pavement Coating.
      a. Primer: As recommended by coating manufacturer.
      b. Intermediate Coats: Three coats, same as top coat.
      c. Top Coat: SB120.
      d. Colorant: StreetBond Colorant.
   2. Colors: As indicated on drawings.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that pavement coating substrate is dry and in suitable condition to begin pavement coating in accordance with manufacturer's written instructions.

B. Proceed with pavement coating only after unsatisfactory conditions have been corrected.

3.02 PAVEMENT COATING

A. Do not apply pavement coating paint until layout, colors, and placement have been verified with Architect.

B. Allow asphalt paving or concrete surfaces to age for a minimum of 90 days before starting pavement coating.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement coatings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum coverage rate recommended by manufacturer.
   1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to asphalt paving or concrete surface. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.
   2. Game-Lines: Apply game-lines according to paint manufacturer's written instructions.
      a. Mask pavement at game lines and apply paint to produce lines with sharp edges.

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b. Where game lines cross, break minor game line at intersection; do not overlap lines.
c. Apply game lines in widths and colors according to requirements indicated on Drawings.

3.03 PROTECTING AND CLEANING

A. Protect pavement coatings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

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SECTION 32 18 13 - SYNTHETIC TURF SURFACING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of the synthetic grass surfacing as shown on the Drawings and as specified herein.

B. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.02 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. Construction Documents and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.03 RELATED SECTIONS

A. SUBMITTAL PROCEDURES: Section 01 33 00.

B. CLOSEOUT PROCEDURES: Section 01 77 00.

C. EARTHWORK: Section 31 00 00.

D. STORM DRAINAGE UTILITIES: Section 33 40 00.

1.04 REFERENCES

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

B. ASTM F1292 – Standard Specifications for impact Attenuation of Surface Systems Under and Around Playground Equipment.

C. ASTM F1951 – Standard Specifications for Determination of Accessibility of Surface Systems under and around Playground Equipment.

D. ASTM D412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.

E. ASTM D624 – Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.

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F. US Consumer Product Safety Commission (CPSC) Handbook for Playground Safety.

G. Certified Playground Safety Inspector (CPSI), certified by the National Recreation and Park Association.

1.05 GUARANTEE

A. Guarantee all workmanship and materials hereunder against defective workmanship and materials, including damage by leaks and settlement of irrigation trenches, for the duration specified in Division 01 of these Specifications. (The Contractor is not responsible for vandalism or theft after the date of final acceptance.)

1.06 QUALITY CONTROL

A. Qualifications of Contractor: Work must be completed by a qualified and certified installer by manufacturer. Provide proof of 2 successfully completed installations of the same or similar product in the last five years.

B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.

C. Reviews: Specifically request reviews of all items listed below in “Inspection Requirements” prior to progressing to the next level of work.

D. Certification: Ensure that the contractor installing the rubber playground surfacing is trained and certified in the installation by the manufacturer. The training and certification must have been completed within two years prior to the installation date.

E. Standards:

1. Provide work and material in full accordance applicable state or local laws or regulations.

2. Furnish, without extra charge, additional material and labor required to comply with these rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.

3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

F. Comply with the requirements of Section 01 77 00 – CLOSEOUT PROCEDURES.

1.07 INSPECTION REQUIREMENTS

A. Obtain verification from Project Inspector at the appropriate time during construction and prior to further progression of work in this Section.

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B. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.08 SUBMITTALS AND SUBSTITUTIONS

A. Comply with requirements of Section 01 33 00 – SUBMITTAL PROCEDURES.

B. Product Data: Submit manufacturer's product data, and installation instructions.

C. Installer's Project References: Submit copy of manufacturer issued installation certification.

D. Verification Samples: Submit manufacturer's standard verification samples of at least 12 inches by 12 inches.

E. Test Reports: Submit test reports from qualified independent testing agency indicating results of the following tests:

1. Impact Attenuation: ASTM F1292

F. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner's Representative. Submit no more than one request for substitution for each item. The decision of the Owner's Representative is final.

G. Use equipment capacities specified herein as the minimum acceptable standards.

H. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner's Representative.

I. Make any mechanical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner's Representative and without additional cost to Owner. Approval by Owner's Representative of substituted equipment and/or dimensional drawing does not waive these requirements.

J. Do not construe approval of material as authorization for any deviations from Specifications unless the attention of Owner's Representative has been directed to specified deviations.

1.09 PROJECT CONDITIONS, AND PROTECTION

A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.

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B. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.

C. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer

B. Storage: Store materials in accordance with manufacturer's instructions.

C. Handling: Protect materials during handling and installation to prevent damage.

1.11 MAINTENANCE MATERIAL SUBMITTALS

A. See Section 01 77 00 "Closeout Procedures" for submission of maintenance material items.

B. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Turf Fabric: Minimum of 50 square feet.

2. Infill: Minimum of two bags of each type.

3. Seaming Tape and Adhesive: One roll of seaming tape and one gallon of adhesive.

4. One new set of maintenance tools of type recommended by synthetic grass surfacing manufacturer for installation.

1.12 MAINTENANCE AND OPERATING INSTRUCTIONS

A. Furnish three complete sets of maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.

B. Incorporate the following information in these sets:

1. Typewritten maintenance instructions for equipment.

2. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.

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3. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.

PART 2 - PRODUCTS

2.01 GENERAL

A. Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing. All material containers or certificates shall be clearly marked by the manufacturer as to the contents for inspection.

2.02 PERFORMANCE REQUIREMENTS

A. Turf Fabric: Turf fabric tested in accordance with the following methods, with additional test method conditions for each method in accordance with ASTM F1551, ASTM D7968, EN71-3, and EPA-537-A.

1. Tuft Bind: Not less than 8 lb/ft in accordance with ASTM D1335.

2. Breaking Strength: Minimum 200 lb/ft in warp direction and minimum 200 lb/ft perpendicular to warp direction, in accordance with ASTM D5034.

B. Synthetic Turf Playing Surfaces: Assembly tested in accordance with the following methods, with additional test method conditions for each method in accordance with ASTM F1551, and ADA Compliance ASTM F1951.

1. Impact Attenuation: in accordance with ASTM F1292.

2. Abrasiveness Index: in accordance with ASTM F1015.

C. Exterior Fire Test Exposure: Class A for application indicated in accordance with ASTM D2859. Identify products with appropriate markings to applicable testing agency.

2.03 MATERIALS

A. Turf Fabric: Woven turf fabric with olive green colored fiber and UV resistance, complying with the following:

1. Basis-of-Design Product: Subject to compliance with requirements, provide ForeverLawn Playground Grass ULTRA.

2. Pile Weight: 103 oz./sq. yd. in accordance with ASTM D5848.

3. Pile Height: 1-1/2 inches in accordance with ASTM D5823.

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B. Backing: Manufacturer's standard polypropylene polyester primary backing with urethane-coated secondary backing; provide perforations or drainage channels sufficient to meet permeability indicated.

C. Infill: Manufacturer's standard rubber and sand infill.

1. Infill Proportions: Manufacturer's standard proportions

D. Seaming Method: Adhesive.

E. Sand Infill: Uniformly sized latex-coated silica sand free of silts, clays, and contaminants, and of subangular or rounder shape in accordance with ASTM F1632; mesh size as recommended by synthetic grass surfacing manufacturer.

F. Seam Adhesive: One- or two-part urethane, recommended or approved by synthetic grass surfacing manufacturer, and suitable for ambient conditions at time of installation.

G. Seam Tape: Synthetic grass manufacturer's recommended seam tape, minimum 12 inches wide.

H. Impact-Attenuation Pad: Manufacturer's standard impact-attenuation pad with permeability sufficient to meet synthetic grass surfacing assembly permeability indicated to meet the fall height requirements of each play area.

PART 3 - EXECUTION

3.01 SITE CONDITIONS

A. Locations of existing utilities and other improvements shown on the Drawings are approximate. Verify existing conditions and, should any utilities be encountered that are not indicated on the plans, notify the Owner’s Representative immediately. Accept responsibility for any damages caused to existing services.

3.02 EXAMINATION

A. Examine areas to receive synthetic turf. Notify Architect if areas are not acceptable. Do not begin installation until unacceptable conditions have been corrected.

3.03 PREPARATION

A. Prepare subsurface in accordance with manufacturer's instructions to ensure proper slope, support and drainage for synthetic turf.

3.04 INSTALLATION

A. Avoid disturbance of base during installation of impact-attenuation pad and turf fabric.

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B. Impact-Attenuation Pad Installation: Roll out pad and allow to relax a minimum of six hours prior to final fit and trim. Stagger head seams between adjacent rows. Fit seams snugly without stretching or forcing.

C. Roll out turf fabric and allow to relax at least four hours prior to seaming.

D. Provide seams flat and snug, with no gaps or fraying. Remove yarns that are trapped within seams. Attach turf fabric to perimeter restraint system as recommended by the manufacturer.

E. Repair loose seams and bubbles formed due to expansion of turf fabric prior to installation of infill.

F. Evenly broadcast and groom infill by machine in proportions and depth after settling as recommended by the manufacturer, and to meet indicated performance requirements. Rake fibers trapped by infill to surface.

G. Install synthetic turf in accordance with manufacturer's instructions and in compliance with ASTM F1951.

H. Installation to be completed by installers that are trained and approved by manufacturer.

3.05 POST INSTALLATION QUALITY CONTROL

A. Post Installation Test: ASTM F1292 Field Test Method.

1. Perform impact attenuation testing according to ASTM F1292 field test method in presence of Owner's representative within 30 days of installation.

a. Confirm Impact Attenuation Performance:

1.) g-max Score: Less than 125

2.) Head Injury Criteria (HIC) Score: Less than 700.

2. Test Equipment Operator Qualifications:

a. National Recreation and Parks Association/National Playground Safety Institute (NRPA/NPSI), Certified Playground Safety Inspector (CPSI).

b. Trained in the proper operation of Triax test equipment by competent agency

3. Determine compliance with ASTM F 1292, unless otherwise specified in this section.

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3.06 CLEAN-UP

A. Clean synthetic turf in accordance with manufacturer's instructions.

END OF SECTION

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SECTION 32 31 13 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Chain-link fences.
   2. Swing gates.
   3. Swing arm barrier gates.

B. Related Sections:
   1. for cast-in-place concrete.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of fence and gate assembly.
   1. Include plans, elevations, sections, details, and attachments to other work.
   2. Include accessories, hardware, gate operation, and operational clearances.

1.03 FIELD CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Hoover Fence Company.
   2. Master Halco, Inc.

2.02 PERFORMANCE REQUIREMENTS

A. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.
   1. Design Wind Load: **<Insert loads>**.

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a. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified.

2.03 CHAIN-LINK FENCE FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:
1. Fabric Height: As indicated on Drawings.
2. Steel Wire for Fabric: Wire diameter of 0.192 inch.
a. Mesh Size: 1 inch (25 mm).
b. Zinc-Coated Fabric: ASTM A392, Type II, Class 1, 1.2 oz./sq. ft.with zinc coating applied [before] [after] weaving.
c. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.
3. Selvage: Knuckled at both selvages.

2.04 FENCE FRAMEWORK

A. Posts and Rails: ASTM F1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F1043 or ASTM F1083 based on the following:
1. Fence Height: As indicated on Drawings.
2. Heavy-Industrial-Strength Material: Group IA, round steel pipe, Schedule 40.
3. Horizontal Framework Members: top and bottom rails according to ASTM F1043.
4. Metallic Coating for Steel Framework:
a. Type A: Not less than minimum 2.0-oz./sq. ft. average zinc coating according to ASTM A123/A123M or 4.0-oz./sq. ft. zinc coating according to ASTM A653/A653M.
b. Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film.
c. External, Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film. Internal, Type D, consisting of 81 percent, not less than 0.3-mil- thick, zinc-pigmented coating.
d. Type C: Zn-5-Al-MM alloy, consisting of not less than 1.8-oz./sq. ft. coating.
e. Coatings: Any coating above.

2.05 SWING GATES

A. General: ASTM F900 for gate posts and [single] [double] swing gate types.
1. Gate Leaf Width: As indicated.
2. Framework Member Sizes and Strength: Based on gate fabric height as indicated.

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B. Pipe and Tubing:
1. Zinc-Coated Steel: ASTM F1043 and ASTM F1083; protective coating and finish to match fence framework.

C. Frame Corner Construction: Welded.

2.06 FITTINGS

A. Provide fittings according to ASTM F626.

B. Finish:
1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.

2.07 PRIVACY SLATS

A. Fiber-Glass-Reinforced Plastic Slats: UV-light-stabilized fiber-glass-reinforced plastic, not less than 0.06 inch (1.5 mm) thick, sized to fit mesh specified for direction indicated, with vandal-resistant fasteners and lock strips.

B. Color: As selected by Architect from manufacturer's full range.

2.08 GROUT AND ANCHORING CEMENT

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.

PART 3 - EXECUTION

3.01 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.02 CHAIN-LINK FENCE INSTALLATION

A. Install chain-link fencing according to ASTM F567 and more stringent requirements specified.

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

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1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
    a. Exposed Concrete: Extend 2 inches (50 mm) above grade; shape and smooth to shed water.

D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F567 and terminal pull posts at changes in horizontal or vertical alignment of as indicated on Drawings. For runs exceeding 500 feet, space pull posts an equal distance between corner or end posts.

E. Post Bracing and Intermediate Rails: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
1. Locate horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

F. Top Rail: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

G. Intermediate and Bottom Rails: Secure to posts with fittings.

H. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F626. Bend ends of wire to minimize hazard to individuals and clothing.

I. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.03 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

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3.04 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

END OF SECTION

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SECTION 32 31 19 - DECORATIVE METAL FENCES AND GATES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Decorative metallic-coated-steel tubular picket fences.
   2. Swing gates.

B. Related Sections:
   1. Section 03 30 53 "Miscellaneous Cast-in-Place Concrete" for concrete post concrete fill.
   2. Section 07 42 16.13 "Metal Plate Wall Panels" for perforated metal sheet integral to decorative metal fence and gate assemblies.
   3. Section 08 71 00 "Door Hardware" for gate hardware not specified in this Section.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For fencing and gates.

1.03 CLOSEOUT SUBMITTALS

A. Maintenance Data: For gate operators to include in maintenance manuals.

1.04 WARRANTY

A. Special Warranty on Finishes: Finish manufacturer's standard form in which manufacturer agrees to repair finish or replace metal fencing components that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 DECORATIVE METALLIC-COATED-STEEL TUBULAR PICKET FENCES

A. Decorative Metallic-Coated-Steel Tubular Picket Fences: Comply with ASTM F2408 for industrial application (class) unless otherwise indicated.
   1. Basis-of-Design Product: Ameristar Fence Products; Montage Industrial, Majestic Series 3-Rail Panels with flush bottom rail.

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B. Posts:
1. End and Corner Posts: Square tubes 3 by 3 inchesformed from 0.108-inch nominal-thickness, metallic-coated steel sheet or formed from 0.105-inch nominal-thickness steel sheet and hot-dip galvanized after fabrication.
2. Posts at Swing Gate Openings: Square steel tubing minimum 4 by 4 inches with 1/4-inch wall thickness, hot-dip galvanized.

C. Post Caps: Formed from steel sheet and hot-dip galvanized after forming, manufacturer's standard flat cap.

D. Rails:
1. Metal and Thickness: 0.079-inch nominal-thickness, metallic-coated steel sheet or 0.075-inch nominal-thickness, uncoated steel sheet, hot-dip galvanized after fabrication.

E. Pickets: Square tubes.
1. Terminate tops of pickets at top rail for flush top appearance.

F. Fasteners: Manufacturer's standard tamperproof, corrosion-resistant, color-coated fasteners matching fence components.

G. Metallic-Coated Steel Sheet: Galvanized-steel sheet or aluminum-zinc, alloy-coated steel sheet.

H. Interior surface of tubes formed from uncoated steel sheet shall be hot-dip zinc coated same as exterior.

I. Galvanizing: For components indicated to be galvanized and for which galvanized coating is not specified in ASTM F2408, hot-dip galvanize to comply with ASTM A123/A123M. For hardware items, hot-dip galvanize to comply with ASTM A153/A153M.

J. Finish: Manufacturer's standard factory-applied finish.

2.02 SWING GATES

A. Gate Configuration: As indicated.
1. Basis-of-Design Product: Ameristar Perimeter; Exodus Pedestrian Egress Gate.

B. Gate Frame Height: As indicated.

C. Gate Opening Width: As indicated.

D. Galvanized-Steel Frames and Bracing: Fabricate members from square tubes formed from minimum 0.108-inch nominal-thickness, metallic-coated steel sheet or formed

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from minimum 0.105-inch nominal-thickness steel sheet and hot-dip galvanized after fabrication.

E. Frame Corner Construction: Welded.

F. Additional Rails: Provide as indicated, complying with requirements for fence rails.

G. Infill: Comply with requirements for adjacent fence.

H. Picket Size, Configuration, and Spacing: Comply with requirements for adjacent fence.

I. Hardware: As indicated on drawings.

J. Exit Hardware: BHMA A156.3, Grade 1, Type 1 (rim exit device), with push pad actuating bar, suitable for exterior use.
   1. Mounting Channel: Bent-plate channel formed from 1/8-inch- thick, hot dip galvainzed steel plate. Channel spans gate frame. Exit device is mounted on channel web, recessed between flanges, with flanges extending 1/8 inch beyond push pad surface.

K. Security Screen: 16-gauge, galvanized and perforated steel sheet with 1/8-inch holes staggered at 3/16-inches on center, welded to the fabricated gate or fence panel assembly, hot-dip galvanized.

L. Finish exposed welds to comply with NOMMA Guideline 1, Finish #4 - good-quality, uniform undressed weld with minimal splatter.

M. Galvanizing: For items other than hardware that are indicated to be galvanized, hot-dip galvanize to comply with ASTM A123/A123M. For hardware items, hot-dip galvanize to comply with ASTM A153/A153M.

N. Finish: Match adjacent decorative fencing.

2.03 HORIZONTAL-SLIDE GATES

A. Gate Configuration: As indicated.
   1. Type: Rolling gate, with supporting pipe track at trailing edge and on-grade roller support at leading edge.

B. Gate Frame Height: As indicated.

C. Gate Opening Width: As indicated.

D. Galvanized-Steel Frames and Bracing: Fabricate members from square tubing.

E. Frame Corner Construction:

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1. Welded frame.

F. Additional Rails: Provide as indicated, complying with requirements for fence rails.

G. Infill: Comply with requirements for adjacent fence.

H. Picket Size, Configuration, and Spacing: Comply with requirements for adjacent fence.

I. Hardware: As indicated on drawings fabricated from galvanized steel .

J. Finish exposed welds to comply with NOMMA Guideline 1, Finish #4 - good-quality, uniform undressed weld with minimal splatter.

K. Galvanizing: For items other than hardware that are indicated to be galvanized, hot-dip galvanize to comply with ASTM A123/A123M. For hardware items, hot-dip galvanize to comply with ASTM A153/A153M.

L. Finish: Match adjacent decorative fencing.

2.04 STEEL AND IRON

A. Plates, Shapes, and Bars: ASTM A36/A36M.

B. Bars (Pickets): Hot-rolled, carbon steel complying with ASTM A29/A29M, Grade 1010.

C. Tubing: ASTM A500/A500M, cold-formed steel tubing.

D. Galvanized-Steel Sheet: ASTM A653/A653M, structural quality, Grade 50, with G90 coating.

2.05 METALLIC-COATED-STEEL FINISHES

A. Powder Coating: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat finish consisting of epoxy prime coat and TGIC polyester topcoat to a minimum dry film thickness of 2 mils. Comply with coating manufacturer's written instructions to achieve a minimum total dry film thickness of 4 mils.
1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.

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B. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 DECORATIVE FENCE INSTALLATION

A. Install fences according to manufacturer's written instructions.

3.03 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.04 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Lubricate hardware, gate operators, and other moving parts.

END OF SECTION

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SECTION 32 31 19.55 - DECORATIVE METAL SECURITY GATES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Decorative metal security gates.
   2. Gate operators, including controls.

B. Related Sections:
   1. Section 03 30 53 "Miscellaneous Cast-in-Place Concrete" for concrete footings.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For gates.
   1. Include plans, elevations, sections, gate locations, post spacing, and mounting attachment details.

C. Samples: For each fence material and for each color specified.
   1. Provide Samples 12 inches in length for linear materials.

1.03 CLOSEOUT SUBMITTALS

A. Maintenance Data: For gate operators to include in maintenance manuals.

PART 2 - PRODUCTS

2.01 DECORATIVE METAL SECURITY GATES

A. Decorative Metal Gates:
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
      a. Ametco Manufacturing Corp.

B. Galvanizing: For components indicated to be galvanized, hot-dip galvanize to comply with ASTM A123/A123M. For hardware items, hot-dip galvanize to comply with ASTM A153/A153M.

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C. Finish: [**Organic coating complying with requirements in ASTM F2408**] [**Powder coating**].

2.02 SWING GATES

A. Gate Configuration: As indicated.

B. Gate Frame Height: As indicated.

C. Gate Opening Width: As indicated.

D. Galvanized-Steel Frames and Bracing: Fabricate members from square tubes [**1-1/2 by 1-1/2 inches**] [**1-3/4 by 1-3/4 inches**] [**2 by 2 inches**] [**2-1/2 by 2-1/2 inches**] formed from minimum 0.105-inch nominal-thickness steel and hot-dip galvanized after fabrication.

E. Frame Construction: Welded.

F. Infill: As indicated on drawings.
1. Wire Mesh:
a. 0.192-inch- diameter, intermediate-crimp steel wire woven into 2-inch diamond mesh, hot-dip galvanized.
b. 0.192-inch- diameter steel wire, resistance welded into 1-1/2-by-2-1/2-inch rectangular mesh, hot-dip galvanized.
2. Perforated Metal Sheet: Uncoated steel sheet, perforated as indicated, [**0.060-inch**] [**0.075-inch**] [**0.105-inch**] <**Insert dimension**> nominal thickness.

G. Hardware: Latches permitting operation from both sides of gate, hinges, and keepers for each gate leaf more than 5 feet wide. Provide center gate stops and cane bolts for pairs of gates.[**Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.**]
1. <**Insert requirements for padlocks and chains if not Owner furnished**>.

H. Hinges: BHMA A156.1, Grade 1, suitable for exterior use.
1. Function: 39 - Full surface, triple weight, antifriction bearing.
2. Material: Wrought steel, forged steel, cast steel, or malleable iron; galvanized.

I. Rim Locks: BHMA A156.5, Grade 1, suitable for exterior use.
1. Function: [**621 - Latchbolt by key from outside and by turn from inside. Latchbolt is held retracted by device from inside**] [**622 - Deadbolt by key from outside and by turn from inside**] [**626 - Interlocking deadbolt operated by key from either side**] [**627 - Interlocking deadbolt operated by key from outside and by turn from inside**] [**629 - Deadlocking latchbolt by key from outside and by turn from inside**] <**Insert function**>.
2. Material: Cast, forged, or extruded brass or bronze.

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3. Mounting Plate: Configuration necessary for mounting locks. Fabricate from 1/8-inch- thick, [**steel plate; galvanized**] [**aluminum plate**].

J. Mortise Locks: BHMA A156.13, Grade 1, suitable for exterior use.
1. Function: [**F06 - Holdback lock**] [**F07 - Storeroom or closet lock**] [**F09 - Apartment, exit, or public toilet lock**] [**F16 - Double-cylinder deadlock**] [**F17 - Deadlock**] <**Insert function**>.
2. Material: Brass or bronze.
3. Levers: Cast, forged, or extruded brass or bronze.
4. Mounting Box: Configuration necessary to enclose locks. Fabricate from 1/8-inch- thick, [**steel plate; galvanized**] [**aluminum plate**].

K. Cane Bolts: Provide for inactive leaf of pairs of gates. Fabricated from [**1/2-inch-**] [**3/4-inch-**] diameter, round steel bars, hot-dip galvanized after fabrication. Finish to match gates. Provide galvanized-steel pipe strikes to receive cane bolts in [**closed position**] [**both open and closed positions**].

L. Finish exposed welds to comply with NOMMA Guideline 1, [**Finish #2 - completely sanded joint, some undercutting and pinholes okay**] [**Finish #3 - partially dressed weld with splatter removed**] [**Finish #4 - good-quality, uniform undressed weld with minimal splatter**].

M. Galvanizing: For items other than hardware that are indicated to be galvanized, hot-dip galvanize to comply with ASTM A123/A123M. For hardware items, hot-dip galvanize to comply with ASTM A153/A153M.

N. Metallic-Coated-Steel Finish: [**High-performance coating**] [**Galvanized finish**].

O. Steel Finish: [**Primed**] [**Shop painted**] [**High-performance coating**].

2.03 STEEL AND IRON

A. Plates, Shapes, and Bars: ASTM A36/A36M.

B. Tubing: ASTM A500/A500M, cold-formed steel tubing.

C. Galvanized-Steel Sheet: ASTM A653/A653M, structural quality, Grade 50, with G90 coating.

2.04 COATING MATERIALS

A. Shop Primer for Steel: Manufacturer's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

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2.05 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Nonshrink Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M and specifically recommended by manufacturer for exterior applications.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.

B. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

B. Post Excavation: Drill or hand-excavate holes for posts in firm, undisturbed soil. Excavate holes to a diameter of not less than 4 times post size and a depth of not less than 24 inches plus 3 inches for each foot or fraction of a foot that fence height exceeds 4 feet.

C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
   1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
   2. Concrete Fill: Place concrete around [**posts**] [**and**] [**sleeves**] and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
      a. Exposed Concrete: Extend 2 inches above grade. Finish and slope top surface to drain water away from post.
      b. Concealed Concrete: Top [**2 inches**] <**Insert dimension**> below grade as indicated on Drawings to allow covering with surface material. Slope top surface of concrete to drain water away from post.

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3. Posts Set in Concrete: Extend post to within 6 inches of specified excavation depth, but not closer than 3 inches to bottom of concrete.
4. Space posts uniformly at [**6 feet**] [**8 feet**] <**Insert dimension**> o.c.

3.03 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Automatic Gate Operators: Energize circuits to electrical equipment and devices. Adjust operators, controls, safety devices,[**alarms,**] and limit switches.
1. Hydraulic Operators: Purge operating system, adjust pressure and fluid levels, and check for leaks.
2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
3. Test and adjust controls[**, alarms,**] and safeties. Replace damaged and malfunctioning controls and equipment.

C. Lubricate hardware and other moving parts.

END OF SECTION

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SECTION 32 33 00 - SITE FURNISHINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Trash receptacles.
2. Tree grates.
3. Bicycle racks/lockers.
4. Wire mesh teaching screen
5. Garden Boxes
6. Sundail
7. Drinking Fountain
8. Various Seating Elements

1.02 RELATED REQUIREMENTS

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

B. Section 01 8113, Sustainable Design Requirements, for CAL-Green general requirements and procedures.

C. Section 32 1600, Site Concrete.

D. Section 32 8000, Irrigation.

E. Section 32 9000, Planting.

F. Section 33 4000, Storm Drainage Utilities.

1.03 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

(Reserved for copyright notice as needed or required by each consultant)

C. ASTM International (ASTM):

1. A36/A36M: Standard Specification for Carbon Structural Steel.

2. A787/A787M: Standard Specification for Electric-Resistance-Welded Metallic-Coated Carbon Steel Mechanical Tubing.

3. C150/C150M: Standard Specification for Portland Cement.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

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

2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.

3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

B. Coordination:

1. Contractor shall be responsible for the proper installation of all accessories embedded in concrete and for the provision of connections, holes, openings, and similar work necessary to the execution of the work of the trades.

1.05 ACTION SUBMITTALS

A. Order all manufactured items within 15 days of award of contract so items will be on hand as construction progresses. Show proof of ordering and, if desired, request progress payment for the material cost at this time.

B. Shop Drawings:

1. Horizontal and vertical layout of site furnishings applicable to the respective furnishings item.

C. Product Data: Manufacturer’s literature, specifications, installation instructions, maintenance instructions, and footing instructions as applicable for proposed products.

D. Samples:

1. Finishes and integral colors for selection.

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2. Manufacturer’s full range of colors for Architect’s selection.

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For installer.

B. Sustainable Design:

1. General:

a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.

b. Sustainable design submittals are in addition to other submittals.

2. The following information shall be provided:

a. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

C. Sample of manufacturer’s warranty.

1.07 CLOSEOUT SUBMITTALS

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

1.08 QUALITY ASSURANCE

A. Installer Qualifications: Engage experienced subcontractors, with minimum 5 years of experience installing site furnishings similar in material, design, and extent to each type indicated for this Project and with a record of successful in-service performance.

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

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

D. Materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.09 DELIVERY, STORAGE AND HANDLING

A. Site furnishings shall be delivered in good condition in original unopened packages with labels intact and unloaded at job site in such a manner that no damage occurs to the product during hauling, handling or unloading at the job site.

(Reserved for copyright notice as needed or required by each consultant)

B. Store materials in protected, dry conditions off of ground and in areas so as to not interfere with the progress of the Work.

C. Transport, store and handle in strict accordance with the manufacturer's written instructions and recommendations.

1.10 FIELD CONDITIONS

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

1.11 WARRANTY

A. Manufacturer: In addition to the Contractor's and Subcontractor's Guarantee, furnish Owner with manufacturer's fully executed written warranties against defects in materials and workmanship as available and for the following for the period noted:

PART 2 - PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

A. Sustainable Design:

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

2.02 MATERIALS

A. Trash Receptacles: As indicated on Drawings.

B. Tree Grates: As indicated on Drawings.

C. Bicycle Racks: As indicated on Drawings.

D. Bicycle Lockers: As indicated on Drawings.

E. Various Seating Elements

1. Concrete seating: Wausau, or equal.

2. Seating boulders: As indicated on Drawings.

3. Wood seating log

a. Triple balance beam: As indicated on Drawings.

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b. Double balance beam: As indicated on Drawings.

c. Single balance beam: As indicated on Drawings.

4. Bench: As indicated on Drawings.

F. Teaching Screens: As indicated on Drawings.

G. Drinking Fountain: As indicated on Drawings.

H. Sun Dial: As indicated on Drawings.

I. Garden Boxes: As indicated on Drawings.

PART 3 - EXECUTION

3.01 EXAMINATION

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

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

C. Do not proceed with installation until conditions for installation are satisfactory.

3.02 INSTALLATION

A. General:

1. Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the Drawings and as herein specified.

2. Furnish anchors, bolts, and appurtenances required as provided or recommended by manufacturer for installation to ensure proper fit and accurate placements.

B. Locate equipment furnishing as indicated on the Drawings. If not shown, locate in accordance with shop drawings and as approved by Architect.

C. Install site furnishings level, plumb, true, and securely anchored and positioned at locations indicated on the Drawings.

D. Cover all exposed fasteners with integral cover plates or applied vandal-proof covers, so there are no rough or protruding edges which can cause injury.

3.03 CLEANING AND ADJUSTING

(Reserved for copyright notice as needed or required by each consultant)

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

B. Thoroughly wash surfaces and remove foreign material.

C. Galvanized metal that is cut, damaged, or modified after fabrication shall be immediately painted with zinc-rich paint to prevent rusting.

D. Leave entire work in neat, orderly, clean and acceptable condition.

3.04 PROTECTION

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

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

C. In the event of damage, make repairs or replace damaged items to the approval of the Architect at no additional cost to the Owner.

END OF SECTION

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SECTION 32 80 00 - IRRIGATION

PART 1 - GENERAL

Construction Documents and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.01 DESCRIPTION

A. Scope of Work: Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of an automatic sprinkler irrigation system, including all piping, sprinkler heads, controls, connections, testing, etc. as shown on the Drawings and as specified herein. The water source for this project is potable water.

B. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.02 RELATED SECTIONS

A. SUBMITTAL PROCEDURES: Section 01 33 00.

B. CLOSEOUT PROCEDURES: Section 01 77 00.

C. ELECTRICAL: Division 26.

D. EARTHWORK: Section 31 00 00.

E. LANDSCAPING: Section 32 90 00.

1.03 GUARANTEE

Guarantee all workmanship and materials hereunder against defective workmanship and materials, including damage by leaks and settlement of irrigation trenches, for the duration specified in Division 01 of these Specifications. (The Contractor is not responsible for vandalism or theft after date of final acceptance.)

1.04 QUALITY CONTROL

A. Qualifications of Contractor: Work must be completed by a licensed Landscape Contractor. Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+\- 20% of the construction cost) and scope for education campuses. Contractor to have a minimum of two projects either completed or in construction in the last five years.

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B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.

C. Reviews: Specifically request reviews of all items listed below in “Inspection Requirements” prior to progressing to the next level of work.

D. Certification: Ensure that the contractor installing the Central Control System is trained and certified in the installation of the Central Control System. The training and certification must have been completed within two years prior to the installation date.

E. Standards:

1. Provide work and material in full accordance with the rules and regulations of the California Electric Code; the California Plumbing Code; and other applicable state or local laws or regulations.

2. Furnish, without extra charge, additional material and labor required to comply with these rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.

3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

F. Delivery, Storage, and Handling:

1. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect related work and material.

2. Handle plastic pipe carefully, especially protecting it from prolonged exposure to sunlight. Store pipe on beds that are the full length of the pipe, and keep pipe flat and off the ground with blocks.

G. Required Start-up Procedures:

1. Booster Pump:

a. Order booster pump as soon as possible to avoid delays in the project.

b. After booster pump and electrical connections have been installed, power has been made available, the downstream irrigation system has been pressure-tested, heads have been set, and trenches have been backfilled and compacted, request that the booster pump manufacturer’s technician participate in and/or direct the start-up of the booster pump. Start-up shall include all testing and settings for the following:

1.) Flow

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2.) Pressure

3.) Connections

4.) Electrical currents

5.) Wire connections

6.) Pump installation

c. Upon successful completion of testing by the booster pump technician, request that a checklist/certification be completed and signed by the technician. Deliver copies of the certification to both the Owner's Representative and the Landscape Architect prior to the commencement of the landscape maintenance period.

2. Automatic Controller

a. Install controllers, master valves, flow sensors, wiring, cables, Ethernet and any other components not shown on the Drawings.

b. Request that the manufacturer's representative participate and/or direct the start-up of the Central Control System. Start-up shall include all testing and settings for the following:

1.) Flow sensor

2.) Grounding

3.) Wire connections

4.) Overall instruction

c. Run the system; record the flows per valve and report them to the Owner's Representative.

H. Comply with the requirements of Section 01 77 00 – CLOSEOUT PROCEDURES.

1.05 INSPECTION REQUIREMENTS

A. Request and hold a pre-construction meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and the Landscape Architect.

B. Prior to commencement of the work of this Section, obtain written verification from the project Civil Engineer that the rough grade in landscape areas is in conformance with Section 31 00 00 - EARTHWORK.

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C. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:

1. Pressure testing of all mainlines and lateral lines (See “Hydrostatic Tests – Open Trench” in Part 3.15 of this Section),

2. Trench depth,

3. Sleeves under pavement,

4. Flushing of all mainlines and lateral lines,

5. Installation of Leemco joint restraints and bolts,

6. Backfill and pipe bedding,

7. Layout of heads,

8. Operation of system and coverage adjustments (with Landscape Architect) after system is fully automated and operational, backfill of trenching is completed, and surface has been restored to original grades. This review is to be completed in conjunction with the delivery of plant material and review of finish grade in all planted areas.

D. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.06 SUBMITTALS AND SUBSTITUTIONS

A. Comply with requirements of Section 01 33 00 – SUBMITTAL PROCEDURES.

B. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner’s Representative. Submit no more than one request for substitution for each item. The decision of the Owner’s Representative is final.

C. Use equipment capacities specified herein as the minimum acceptable standards.

D. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner’s Representative.

E. Make any mechanical, electrical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner’s Representative and without additional cost to Owner. Approval by Owner’s Representative of substituted equipment and/or dimensional drawing does not waive these requirements.

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F. Do not construe approval of material as authorization for any deviations from Specifications unless attention of Owner's Representative has been directed to specified deviations.

1.07 PROJECT CONDITIONS, AND PROTECTION

A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.

B. Protect existing trees-to-remain as specified in "Existing Tree Protection" in Part 3.02 of this Section.

C. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.

D. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.08 MAINTENANCE AND OPERATING INSTRUCTIONS

A. Furnish three complete sets of operating maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.

B. Incorporate the following information in these sets:

1. Complete operating instructions for each item of irrigation equipment.

2. Typewritten maintenance instructions for each item of irrigation equipment.

3. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.

4. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.

1.09 RECORD DRAWINGS

Upon completion of work, and as a precedent to final payment, deliver to Owner's Representative one complete set of reproducible originals of Drawings showing work exactly as installed. (See "Record Drawings" in Part 3.18 of this Section)

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PART 2 - PRODUCTS

2.01 GENERAL

Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.

2.02 MATERIALS

A. Central Control System: As indicated on Drawings.

B. Master Valves and Flow Sensors: As indicated on Drawings.

C. Automatic Control Valves: As indicated on Drawings.

D. Gate Valve: As indicated on Drawings.

E. Pipe and Fittings:

1. PVC pipe: As indicated on Drawings.

2. PVC fittings three-inch (3") size and smaller: High impact, standard weight, Schedule 40, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

3. PVC fittings four-inch (4") size and larger: High impact, standard weight, Class 200 gasketed, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

4. All plastic pipe and fittings: Continuously and permanently marked with manufacturer's name, type of material, IPS size, schedule, NSF approval, and code number.

5. Threaded PVC pipe and nipples: IPS Schedule 80 when necessary to use threaded connections to gauges, valves, or control valves. Threaded adapters may be used in place of nipples when making pipe to valve connections.

6. Use 45-degree fittings for changes in depth of pipe, and at transition from main line to automatic control valves.

7. Piping above ground: Schedule 40 galvanized steel with cast-iron fittings.

8. Piping used for electrical purposes to be Schedule 40 PVC Rigid Nonmetallic Conduit electrical conduit.

F. Booster Pump: As indicated on Drawings.

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G. PVC Primer: Weld-On P-70 Purple Primer or approved equal.

H. PVC Glue: Weld-On 711 Gray heavy bodied PVC Cement or approved equal.

I. PVC Glue for connections to Flexible PVC: Weld-On 795 Blue Flex PVC Cement or approved equal.

J. Sprinkler Heads: As indicated on Drawings.

K. Quick Coupler Valves: As indicated on Drawings.

L. Sleeves: As indicated on Drawings.

M. All Valve Boxes and Covers: Manufactured, green with “Irrigation – Non-Potable” permanently embossed on cover. Carson, Rainbird or approved equal.

N. Automatic Sprinkler Control Wire:

1. Connections between remote control valves and controller: UF-14 direct burial polyethylene (PE) insulated wire, Paige Electric P7079D or approved equal. Common wire to be white, and lead wire to be colored. If multiple controllers are used, a different color is to be used for each controller's lead wire. (Use red for the first controller). Spare wires are to be yellow.

2. UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.

3. Provide adequate working space around electrical equipment in compliance with local codes and ordinances.

4. Electrical, other than low voltage, such as power wiring, conduit, fuses, thermal overloads and disconnect switches, is included under Division 26 of these Specifications.

O. Trace Wire:

1. Direct burial #12 AWG Solid, steel core soft drawn tracer wire, 250# average tensile break load, 30 mil high molecular-high density polyethylene jacket complying with ASTM-D-1248, 30-volt rating. Color shall be green.

2. Connectors: UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.

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P. Master Valve and Flow Sensor Connection to Controller:

1. Master valve wires are to be UF-14 direct burial plastic-coated wire. Wire color to be blue for the lead and white for the common. If there are two master valves, the second master valve wire is to be blue/white striped for the lead and white for the common.

2. Flow sensor wires are to be Rainbird PE-39. If there are two flow sensors, the wires leading to each flow sensor is be a different color.

Q. Unions And Flanges:

1. Steel unions and flanges two inches (2") and smaller: 150 lb. screwed black (brass to iron seat) or galvanized malleable iron (ground joint).

2. Steel unions and flanges two and one-half inches (2 ½") and larger: 150 lb. black flange union, flat-faced, full gasket.

3. Gaskets: One-sixteenth inch (1/16") thick rubber Garlock No. 122, Johns-Manville or approved equal.

4. Flange Bolts: Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper-plated steel bolts and nuts or brass bolts and nuts for brass flanges.

R. Valve Identification Tags: Christy's irrigation ID tags, standard yellow color or approved equal.

S. Sand for Trench Backfill: Natural sand, free of roots, bark, sticks, rags, or other extraneous material.

PART 3 - EXECUTION

3.01 SITE CONDITIONS

Locations of existing utilities and other improvements shown on the Drawings are approximate. Verify existing conditions and, should any utilities be encountered that are not indicated on the plans, notify the Owner's Representative immediately. Accept responsibility for any damages caused to existing services.

3.02 PREPARATION

A. Scheduling: Notify the Project Inspector prior to commencing and/or continuing the work of this Section. Remove and replace, at no cost to Owner, any work required as a result of failure to give the appropriate notification.

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B. Examination: Examine conditions of work in place before beginning work; report defects.

C. Measurements: Take field measurements; report variance between plan and field dimensions.

D. Protection: Maintain warning signs, shoring and barricades as required. Prevent injury to, or defacement of, existing improvements. At no additional cost to Owner, repair or replace items damaged by installation operations.

E. Existing Tree Protection:

1. Avoid unnecessary root disturbance, compaction of soils within drip line, or limb breakage.

2. Do not store material or dispose of any material other than clean water within the drip line.

3. Provide adequate irrigation during construction.

4. Replace any tree damaged during construction with a tree of equal size and value at no additional cost to Owner.

5. Adjust trench locations in field to minimize damage to existing elements and plant roots of trees-to-remain at no additional cost to Owner.

F. Surface Preparation: Prior to beginning sprinkler irrigation work, complete placement of topsoil as specified in Section 31 00 00 – EARTHWORK. Notify Project Inspector of irregularities if any.

3.03 AUTOMATIC CONTROLLER

A. Install system and components as per Drawings and manufacturer’s recommendations. All wiring connections shall be neatly accomplished within the controller cabinet. Connect Ethernet and grounding system as per manufacturer’s recommendations.

B. Connect automatic control valves to controller(s) in sequence as shown on Drawings.

C. Install all exposed wires to a minimum of twenty-four inches (24”) beyond controller within a UL approved rigid conduit.

3.04 MASTER VALVES AND FLOW SENSOR

A. Master Valve: Install as per manufacturer’s recommendation. Connect master valve wiring to the automatic controller. Install wire in a conduit. Wire is not to have any splices between the valve and the controller.

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B. Flow Sensor: Install as per manufacturer's recommendation. When using a "saddle" installation, install at the correct depth in the pipe and orientate the paddle properly for accurate reading of flow. Install wire in a conduit. The wire is not to have any splices between the valve and the controller.

3.05 GRADING

Install all irrigation features to their finished grade and at depths indicated. Complete and /or accommodate all rough grading and/or finish grading before commencing with trenching.

3.06 LAYOUT

A. Lay out work as accurately as possible to Drawings. Drawings are generally diagrammatic to extent that swing joint offsets and fittings are not shown. Record all changes on the Record Drawings.

B. Do not willfully install the irrigation system as shown on Drawings when it is obvious, in the field, that obstructions or other discrepancies exist which may not have been considered in the design. Notify Owner's Representative of discrepancies before proceeding.

3.07 EXCAVATING AND TRENCHING

A. General: Perform excavations as required for installation of work included under this Section, including shoring of earth banks to prevent cave-ins. Restore surfaces, existing underground installations, etc., damaged or cut as result of this work to their original condition and in a manner approved by the Landscape Architect.

B. Width:

1. Make trenches wide enough to allow a minimum of six inches (6") between parallel pipelines and three inches (3") between side of pipe and side of trench. Do not allow stacking of pipe within trench.

2. Allow a minimum clearance of twelve inches (12") in any direction from parallel pipes of other trades.

C. Preparation of Excavations: Remove rubbish and rocks from trenches. Bed pipe on a minimum of three inches (3") of clean, rock-free soil to provide a firm, uniform bearing for entire length of pipeline. Cover pipe with a minimum of three inches (3") of clean, rock-free soil. If clean, rock-free soil is not available, use sand for pipe bedding and three inches (3") of backfill above the pipe. The remainder of the trench backfill material can be native soil. Do not allow wedging or blocking of pipe.

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D. Minimum depth of cover: Unless shown otherwise, provide the following minimums:

1. Mainline: twenty-four inches (24”) cover.

2. Lateral line: twelve inches (12”) cover for spray heads, and eighteen inches (18”) cover for rotor heads.

E. Conflicts with other trades:

1. Hand-excavate trenches where potential conflict with other underground utilities exist.

2. Where other utilities interfere with irrigation trenching and piping work, adjust the trench depth as instructed by Owner’s Representative.

3.08 BACKFILL AND COMPACTING

A. General: Do not begin until hydrostatic tests are completed. When system is operating and after required tests and inspections have been made, backfill trenches under paving areas to the compaction rate specified in Section 31 00 00 – EARTHWORK.

B. Place backfill in six-inch (6”) layers and compact with an acceptable mechanical compactor.

1. Compact backfill material in landscape areas to eighty-five percent (85%) maximum dry density of the soil.

2. If settlement occurs along trenches, make adjustments in pipes, valves, and sprinkler heads, soil, sod or paving as necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, without additional cost to the Owner.

C. Excess Soil: Remove all rocks, debris, and excess soil that results from sprinkler irrigation trenching operations, landscape planting, and soil preparation operations off site at no additional cost to the Owner. If soil meets topsoil requirements in Section 31 00 00 – EARTHWORK, it may be used for finish grading.

D. Finishing: Dress-off areas to eliminate construction scars.

3.09 CONTROL WIRES

A. General: Install control wires beneath sprinkler main line whenever possible; tape wires to mainline pipe. Provide one spare wire for each controller.

B. Slack Wire: Provide eighteen inches (18”) of slack wire for each wire connected to automatic control valve. Slack wire shall be coiled and left in the valve box. Tape wires in bundles every ten feet (10’); do not tape wires in sleeves.

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C. Expansion and Contraction: Snake wire in trench to allow for contraction of wire.

D. Wire Passing Under Existing or Future Paving or Construction: Encase in PVC Schedule 40 or galvanized steel conduit extending at least twelve inches (12") beyond edges of paving or construction.

E. Wire Connections: Install wire connections in a waterproof sealing pack.

F. Wire Splicing: Permit splicing only on runs exceeding 500 feet. Locate all splices within valve boxes.

G. Wire Termination: Install wire in a valve box with eighteen inches (18") of slack wire coiled and individually capped with approved waterproof sealing pack.

H. Spare Wire: Install two (2) spare wires along each wire path. If there is more than one wire path from the controller, the contractor to install two (2) spare wires per path. Provide eighteen inches (18") of slack wire at each automatic control valve.

3.10 TRACE WIRE

A. General: Install trace wire above sprinkler main line whenever possible; tape wire to mainline pipe at 10' intervals to ensure the wire remains adjacent to the pipe.

B. Wire Connections: Install wire connections in a waterproof sealing pack.

C. Trace wire access points shall be accessible at all automatic control valves.

D. At all mainline end caps, a minimum of six feet (6') of tracer wire shall be coiled and secured to the cap for future connections. The end of the tracer wire shall be spliced to the wire of a six-pound zinc anode and is to be buried at the same elevation as the irrigation mainline.

E. Testing: The contractor shall perform a continuity test on all trace wires in the presence of the client. If the trace wire is found to be not continuous after testing, Contractor shall repair or replace the failed segment of the wire.

3.11 FLUSHING LINES

Thoroughly flush lines prior to installing valves, performing hydrostatic testing, or installing sprinklers. Divert water to prevent washouts.

3.12 AUTOMATIC CONTROL AND QUICK COUPLER VALVES

A. Install where shown and where practical; place no closer than twelve inches (12") to walk edges, building walls, or fences. Refer to detail for example.

B. Thoroughly flush mainline before installing valve.

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C. Install valves in ground cover areas where possible.

3.13 PIPING

A. General: Install in conformance with reference standards, manufacturer's written directions, as shown on Drawings and as herein specified.

B. Workmanship:

1. General: Install sprinkler irrigation equipment in planted areas throughout the site.

2. Coordination: Organize location of sleeves with other trades as required.

C. Pipe Line Assembly:

1. General:

a. Cutting: Cut pipe square; remove rough edges or burrs.

b. Solvent-welded Connections: Use materials and methods recommended by the pipe manufacturer.

c. Primer to be used on PVC fittings only. No Primer to be used on Flexible PVC tubing.

d. Brushes: Use non-synthetic brushes to apply solvents and primer.

e. Cleaning: Clean pipe and fittings of dirt, moisture, and debris prior to applying solvent or primer.

f. Assembly: Allow pipe to be assembled and welded on the surface or in the trench.

g. Expansion and Contraction: Snake pipe from side to side of trench to allow for expansion and contraction.

h. Location: Locate pipes as shown on Drawings except where existing supply valves, utilities or obstructions prohibit or where slight changes are approved to better suit field conditions.

2. Elastomeric Seal (Gasket) Joints:

a. General: Assemble in strict conformance with the pipe manufacturer's instruction.

b. Rubber Rings: Use rubber rings specific for water service systems.

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c. Cleaning: Thoroughly clean ring and groove of dirt, moisture and debris using a clean, dry cloth. Do not use solvents, lubricants, cleaning fluids or other material for cleaning.

d. Seating: Properly seat ring in groove.

e. Spigot: General: Clean spigot-end of pipe as in “Cleaning” above prior to applying lubricant recommended by pipe manufacturer. Insert spigot into bell and seat to full depth required.

3. Connections:

a. Threaded Plastic Pipe Connection:

1.) Use Teflon tape or pipe joint compound.

2.) When assembling to threaded pipe, take up joint no more than one full turn beyond hand-tight.

b. Metal Valves and Plastic Pipe: Use threaded plastic male adapters.

c. Metal to Metal Connections:

1.) Use specific joint compound or gasket material for type of joint made. Where pipe of dissimilar metals are connected, use dielectric fittings.

2.) Where assembling, do not allow more than three full threads to show when joint is made up.

d. Where assembling soft metal (brass or copper) or plastic pipe, use strap-type friction wrench only; do not use a metal-jawed wrench.

e. Threading:

1.) Do not permit the use of field-threading of plastic pipe or fittings. Use only factory-formed threads.

2.) Use factory-made nipples wherever possible. Permit the use of field-cut threads in metallic pipe only where absolutely necessary. When field-threading, cut threads accurately on axis with sharp dies.

3.) Use pipe joint compound for all threaded joints. Apply compound to male thread only.

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4. Sleeves and conduits:

   a. Use sleeves of adequate size to accommodate retrieval for repair of wiring or piping and extend a minimum of twelve inches (12”) beyond edges of walls or paving.

   b. Provide removable, non-decaying plug at end of sleeve to prevent entrance of soil.

5. Unions: Locate unions for easy removal of equipment or valve.

6. Joint Restraints: Install per manufacturer’s recommendations

7. Capping: Plug or seal opening as lines are installed to prevent entrance materials that would obstruct pipe. Leave in place until removal is necessary for completion of installation.

D. Drip Irrigation Tubing: Install as per Drawings.

3.14 SPRINKLER HEADS

A. Sprinkler heads: Locate as shown on the Drawings except where existing conditions prohibit, or slight changes are approved to achieve as good or better coverage under the same conditions. Do not allow sprinkler head spacing to exceed the maximum shown on the Drawings. Plumb heads.

B. Handling, Assembly of Pipe, Fittings, and Accessories: Allow only skilled tradesmen to handle and assemble pipe, fittings and equipment. Keep interior of pipes, fittings and accessories clean at all times. Close ends of pipe immediately after installation; leave closure in place until removal is necessary for completion of installation. Do not permit bending of pipe.

C. Flushing: Remove end heads and operate system at full pressure until all rust, scale, and sand is removed. Divert water to prevent ponding or damage to finished work.

D. Coverage: Accept responsibility for full and complete coverage of irrigated areas to satisfaction of Landscape Architect and make necessary adjustments to better suit field conditions at no additional costs to Owner.

3.15 CONCRETE WORK

A. Housekeeping pads for at-grade irrigation equipment are included under this Section of Specifications. See plans for any housekeeping pads.

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B. Concrete shall have a minimum strength of 2500 psi. The slump test shall be a four inch (4") maximum slump. At twenty-eight days, the concrete shall have a minimum strength of 2500 psi. Use materials and mix in accordance with ASTM C 94. Refer to Section 32 16 00 SITE CONCRETE.

3.16 FIELD QUALITY CONTROL

A. Visual Inspection: Verify that all pipe is homogenous throughout and free from visual cracks, holes, or foreign materials. Inspect each length of pipe. All materials are subject to impact test at the discretion of the Landscape Architect.

B. Hydrostatic Tests – Open Trench:

1. Center-load piping with a small amount of backfill to prevent arching or slipping under pressure.

2. Request the presence of the Project Inspector in writing at least forty-eight hours in advance of testing.

3. At no additional cost to Owner, test in the presence of the Project Inspector.

4. Apply continuous static water pressure of 100 psi when welded plastic joints have cured at least twenty-four hours, and with the risers capped, as follows: test main lines and submains for four hours; test lateral lines for two hours.

5. Repair leaks resulting from tests; and repeat tests.

6. Test to determine that all sprinkler heads function according to manufacturer's data and give full coverage according to intent of Drawings. Replace any sprinklers not functioning as specified with ones that do, or otherwise correct system to provide satisfactory performance.

C. Continuity Testing: Test locating device and control wires for continuity prior to and after back-filling operations.

3.17 CLEAN-UP

Remove debris resulting from work of this Section.

3.18 ADJUSTMENTS AND MAINTENANCE

A. Adjusting System: Prior to acceptance, satisfactorily adjust and regulate entire system. Set watering schedule on controller appropriate to types of plants and season of year. Adjust remote control valves to operate sprinkler heads at optimum performance based on pressure and simultaneous demands through supply lines.

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B. System Layout: Provide reduced prints of Record Document irrigation plans, laminated in four (4) mil. plastic, of size to fit controller door. Enlarge remote-control valve designations as necessary for legibility. Color-code areas covered by each station. Affix plans to inside of controller door.

C. Instructions: Upon completion of work, instruct maintenance personnel on operation and maintenance procedures for entire system.

D. Flow Charts: Record and prepare an accurate flow-rate chart for each automatic control valve.

3.19 RECORD DRAWINGS

A. Regularly update plans of the system and any changes made to the system throughout the project. Record all changes on this plan before trenches are back-filled.

B. Record the as-built information on reproducible plans provided by the Architect. Complete and submit the Record Drawings to the Architect before applying for payment for work installed.

C. As-built drawings are to be completed electronically with a pdf editing software or computer aided drafting software. As-built drawing done by hand will not be accepted for final submittal.

D. Show the following on the Record Drawings accurately to scale and dimensioned from two permanent points of reference:

1. Distance of mainline from nearby hardscape.

2. Location of automatic control valves, quick couplers, and gate valves.

3. Location and size of all sleeves.

4. Location of automatic control wires and spares.

3.20 OPERATION MANUALS

Deliver two complete sets of manufacturer's warranties, Contractor guarantees, instruction sheets, parts lists and operation manuals to the Architect before requesting final acceptance of the project. Do not request final inspection until the sets are approved.

END OF SECTION

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SECTION 32 90 00 - LANDSCAPING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the following work as specified herein:

1. Soil Preparation and Fertilization
2. Planting
3. Sodding
4. Weed Control
5. Decomposed Granite
6. Mulch
7. Engineered Wood Fiber
8. Clean-up
9. Landscape Maintenance Period
10. Guarantee

B. Work not included in this Section: Landscape elements such as concrete walks, fencing, outdoor lighting, rough grading, and clearing are not a part of this Section unless shown on the landscape Drawings.

C. Construction Documents and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications sections, apply to this section.

1.02 RELATED SECTIONS

A. SUBMITTAL PROCEDURES: Section 01 33 00.

B. CLOSEOUT PROCEDURES: Section 01 77 00.

C. EARTHWORK: Section 31 00 00.

D. IRRIGATION: Section 32 80 00.

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1.03 GUARANTEE

A. The guarantee period for lawn and plant material shall be the duration of the landscape maintenance period, from commencement until final acceptance of the work of this Section. See Division 01 for other applicable guarantee requirements.

B. During the guarantee period, repair and/or replace plants and lawn not in satisfactory growing condition, as determined by Owner's Representative, without additional cost to Owner. Plants are to be replaced as per "Landscape Maintenance" in Part 3.11 of this Section, using plants of the same kind and size specified in plant list.

1.04 QUALITY CONTROL

A. Qualifications: Work must be completed by a licensed Landscape Contractor. Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+\- 20% of the construction cost) and scope for education campuses. Contractor to have a minimum of two projects either completed or in construction in the last five years.

B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.

C. Reviews: Specifically request reviews of all items listed below in "Inspection Requirements" prior to progressing to the next level of work. The Owner's Representative reserves the right to inspect and reject material, both at place of growth and at site, before and/or after planting, for compliance with requirements for name, variety, size and quality.

D. Reference Standards: Meet or exceed Federal, State and County laws requiring inspection of all plants and planting materials for plant disease and insect control.

E. Delivery, Storage, and Handling:

1. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

2. Bulk Materials:

a. Do not dump or store bulk materials near structures, utilities, walkways or pavements, or on existing turf areas or plants.

b. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching

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adjacent properties, water conveyance systems, or walkways.

c. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

F. Plant Material:

1. Conform to the current edition of Horticultural Standards for quality of Number 1 grade nursery stock as adopted by the American Association of Nurserymen. Conform to sizes specified on plant legend. Select plants which have a natural shape and appearance.

2. Select only plants that are true to name, and tag one of each bundle or lot with the name of the plant in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.

3. Tag each plant of a patented variety with the variety and identification number, where applicable, as it is delivered to the job site.

4. Select only plants which have been nursery-grown in accordance with good horticultural practices and which have been grown under climatic conditions similar to those in the locality of the project for at least one year.

5. Select only plants which are typical of their species or variety; have normal habits of growth; are sound, healthy, vigorous, well-branched and densely-foliated when in leaf; are free of disease, insect pests, eggs or larvae; and have a healthy and well-developed root system.

6. Select only container stock that has been grown in the containers in which delivered for at least six (6) months, but not over two (2) years. Provide samples to show that there are no root-bound conditions.

7. Do not use plants that are severely pruned or headed-back to meet size requirements.

8. Do not plant container-grown plants that have cracked or broken balls of earth when taken from the container. Remove canned stock carefully from cans after containers have been cut on two sides with tin snips or other approved cutter.

9. Coordinate a time for the Landscape Architect to inspect the plants upon their delivery to the project site.

10. At any time prior to final acceptance, be prepared to replace any plants that are rejected by the Owner’s Representative because of physical damage to the plant.

11. Do not remove container-grown stock from containers before time of planting.

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12. Be prepared to replace plants which are rejected by the Owner's Representative for the following reasons:

    a. Trunk bark damage caused by sunburn,

    b. Trunk bark wounds caused by rubbing stakes or ties,

    c. Trunk bark damage caused by ties that have girdled the tree,

    d. Tree head development that is lopsided and not symmetrical in form,

    e. Tree branches that cross or touch,

    f. Tree branches with double leaders (unless multi-trunk trees are specified).

13. Stake shrubs with one-inch by one-inch by eighteen-inch (1"x1"x18") stakes in such manner that the stakes are not visible, and tie to upright position if they lean and/or are not growing in a vertical position.

14. Furnish quantities necessary to complete the work as shown on the Drawings and, if necessary, make up for any discrepancies in the quantities given in the Plant List at no additional cost to Owner.

G. Comply with the requirements of Section 01 77 00 – CLOSEOUT PROCEDURES.

1.05 INSPECTION REQUIREMENTS

A. Landscape Architect reserves the right to examine and reject plant material both at place of growth and at site, before and after planting, for compliance with requirements of name, variety, size, and quality.

B. Request and hold a pre-construction meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and Landscape Architect.

C. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:

1. Rough grading is to tolerances specified in Section 31 00 00 – EARTHWORK.

2. The placement of landscape backfill material is as specified in this Section.

3. Prior to the commencement of the planting specified in this Section, the coverage and operation of the sprinkler irrigation system are as specified in Section 32 80 00 - IRRIGATION.

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4. The soil amendment does not include any metal fragments. (Obtain a letter from the manufacturer stating that the material submitted for use on this project has no metal or foreign objects. Submit this letter as part of the Data Sheet submittal package [see “Submittals and Substitutions” in this Section])

5. Required Test: For each load of soil amendment delivered to the site, spread at least two cubic yards (2 cy) of material onto a paved surface approximately two inches (2”) deep. Pass a magnetic rake over the material in two directions. If any metal is found, test the entire load in the same manner. Perform all testing in the presence of the Project Inspector.

6. Soil amendments, fertilizer, bark mulch and materials used for hydroseeding have been delivered to the site by the supplier, the invoices from the supplier indicate the project name and quantities delivered, and the Project Inspector has received copies of all such documents.

7. Prior to planting, amendments and conditioners have been incorporated as per pre-planting recommendations, and planting areas have been finish graded.

D. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

E. Beginning of Maintenance Period: Verify all work is complete, then request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner’s Representative for authorization to begin the landscape maintenance period.

F. End of Maintenance: Verify that all work is complete and acceptable, and that the maintenance has been completed per specifications; and continue to provide landscape maintenance until the Owner’s Representative has accepted the work.

1.06 SUBMITTALS AND SUBSTITUTIONS

A. See Section 01 33 00 – SUBMITTAL PROCEDURES for additional requirements.

B. Plant Material: Within fifteen (15) days after award of contract, locate plant materials required for construction. Ensure that trees and shrubs are contract- grown from a certified nursery. Notify Owner’s Representative of plant material “tied off” for review at selected nursery. If specified material is not obtainable, submit the following to Owner’s Representative: proof of non-availability, proposal for use of equivalent material, photographs of alternative choices of plant material. Include clear, written description of type, size, condition, and general character of plant material.

C. Data Sheets: Provide product data for each type of landscape material indicated in the Drawings and Specifications.

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D. Samples: Submit samples of the following materials to Landscape Architect for approval:

1. Soil amendment: (3) one-quart zip-locked plastic bags.

2. Bark Mulch: (3) one-quart zip-locked plastic bags.

3. Imported Topsoil: (3) one-quart zip-locked plastic bags. (if needed)

4. Decomposed Granite: (3) one-quart zip-locked plastic bags.

E. Provide soils analysis reports prepared by a qualified soils laboratory in compliance with the Soil Testing Requirements under “Soil Testing” in Part 3.02 of this Section.

F. Prior to planting, submit copies of all trucking or packaging tags for all soil amendment, fertilizer and other additives to Landscape Architect so the quantities can be verified.

1.07 PROTECTION AND CLEAN-UP

A. Provide protection for persons and property throughout progress of work. Use temporary barricades as required. Proceed with work in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel. Store materials and equipment where directed.

B. Existing Construction: Execute work in an orderly and careful manner to protect paving, work of other trades, and other improvements.

C. Existing Utilities: Provide protection for existing utilities within construction area. At no additional cost to Owner, repair any damages to utility lines that occur as a result of this work.

D. Landscaping: Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.

E. Paving: Maintain cleanliness of paving areas and other public areas used by equipment, and immediately remove spillage; remove rubbish, debris, and other material resulting from landscaping work, leaving site in a safe and clean condition.

1.08 PLANTING SCHEDULE / ENVIRONMENTAL REQUIREMENTS

A. Install, establish, and maintain all lawn areas for a minimum of ninety (90) days prior to date of substantial completion. Coordinate schedule with other work and overall project schedule. Failure to install lawn areas by this date shall result in assessment of liquidated damages.

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B. Proceed with work in an orderly and timely manner to complete installation of landscaping within contract limits.

C. Planting Season Limits: Do not plant when grounds are wet or temperature is below 25° F. Do not proceed with any soil preparation and fertilization if all planting cannot be completed within Planting Season Limit.

1.09 LANDSCAPE MAINTENANCE PERIOD REQUIREMENTS

A. Beginning of Landscape Maintenance Period:

1. General: Landscape Maintenance Period does not begin until all work is installed and lawn has evenly germinated to an approximated blade height of one and one-half inches (1 ½") and has been mowed at least twice, as determined by Landscape Architect, in writing.

2. Booster Pump: Upon successful completion of testing by the booster pump technician, request that a checklist/certification be completed and signed by the technician. Deliver copies of the certification to both the Owner's Representative and the Landscape Architect prior to the commencement of the landscape maintenance period.

3. Central Control System: Upon successful completion of testing by the technician from [enter technician company], request that a checklist/certification be completed and signed by the technician. Deliver copies of the certification to both the Owner's Representative and the Landscape Architect prior to the commencement of the landscape maintenance period.

4. On-site Inspection: When all work is complete, request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner's Representative who must together authorize and determine the start date for the landscape maintenance period. Coordinate and give notice of the date and time of the on-site meeting to all parties at least forty-eight (48) hours in advance.

5. Acceptability: In cases where the lawn has reached adequate fullness and germination in some areas but not all, and authorization has not been given to begin the maintenance period, proceed with mowing, trimming, spraying, etc., as necessary prior to the beginning of the maintenance period.

B. Duration of Landscape Maintenance Period:

The Landscape Maintenance Period shall continue for a minimum of ninety (90) calendar days. During this time, continuously maintain all areas involved until final acceptance of the work by the Owner's Representative. See Landscape Maintenance Period procedure in Part 3.11 of this Section.

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C. Final Acceptance of the Landscape Maintenance Period:

Request the final inspection forty-eight (48) hours in advance. If items require attention, hold on-site meetings until Landscape Architect can certify, in writing, and in concurrence with the Owner's Representative, the successful completion of the Landscape Maintenance Period.

1.10 RECORD DRAWINGS

Upon completion of work, and as a precedent to final payment, deliver to Owner's Representative one complete set of reproducible originals of Drawings showing work exactly as installed.

PART 2 - PRODUCTS

2.01 GENERAL

Use material in new and perfect condition as specified. Any deviations or substitutions from the Specification and Drawings must first be approved by Owner's Representative in writing prior to use.

2.02 SOIL PREPARATION MATERIALS

A. Topsoil: Fertile; friable; natural loam surface soil; reasonably free of subsoil, clay lumps, brush, weeds and other litter; and free of roots, stumps, stones/rocks, and other extraneous or toxic matter harmful to plant growth.

B. Soil Amendment: One-percent nitrogen-impregnated bark product with a ninety-percent (90%) bark base and zero to one-quarter inch (0-1/4") particle size, or approved equivalent. Do not spread until testing requirements have been satisfied.

C. Fertilizer/Soil Conditioner: Gro-Power Plus or approved equal.

D. Fertilizer for Trees and Shrubs: Seven-gram Gro-Power Planting Tablets (12-8-8 NPK) or approved equal.

E. Vitamin B-1: "Superthrive", "Liquinox Start", "Cal-Liquid", or approved equal.

2.03 MISCELLANEOUS LANDSCAPE MATERIALS

A. Bark Mulch: Untreated, shredded cedar.

B. Tree-staking System: As indicated on Drawings.

C. Pre-Emergent Weed Control: Oxadiazon, "Treeflan", "Ronstar 2G", "Surflan" (Elano Products Company), or approved equal.

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D. Decomposed Granite:

1. Reddish-brown in color.

2. A mixture of fines to three-eighths inch (3/8”) size particles with no clods.

3. Free of vegetation, other soils, debris and rocks, and of such nature that it can be compacted readily under watering and rolling.

E. Decomposed Granite Binder: Shall be Stabilizer by Stabilizer Solutions.

F. Engineered Wood Fiber (EWF): MyBark ReadyPlay EWF or approved equal.

G. Root Barrier: As indicated on Drawings.

2.04 PLANT MATERIAL:

A. Nursery Plant Stock:

1. As indicated on Drawings. Do not remove container-grown stock from containers until planting time. Plants shall be true to name.

2. Healthy, shapely, well-rooted, not pot-bound, free from insect pests or plant diseases and properly "hardened off" before planting. Replace plants that are not alive or are not in satisfactory growing condition, as determined by the Landscape Architect, without additional cost to Owner. The Landscape Architect may reject plants before and/or after planting.

3. Labeled. Label at least one tree and one shrub of each species with a securely-attached, waterproof tag bearing legible designation of botanical and common name.

B. Lawn Sod: Ninety percent (90%) Perennial Ryegrass and ten percent (10%) Kentucky Bluegrass.

PART 3 - EXECUTION

3.01 SITE CONDITIONS

A. Examine the site, verify grade elevations, and observe conditions under which work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner’s Representative.

B. Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.

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C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand-excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

D. When conditions detrimental to sod or plant growth are encountered, such as rubble fill, adverse drainage condition, or other obstructions, notify the Owner's Representative before planting.

3.02 SOIL TESTING

A. Coordinate soil testing in an expeditious and timely manner as required for on-site topsoil materials. Contract with a soil laboratory and include cost of sampling and testing in contract price. Take one (1) sample for every 5,000 square feet of landscape area up to a maximum of six (6) samples under the direction of and in the presence of the Owner's Representative.

B. Submit each sample, according to the quantity of soil required by testing laboratory, to a competent laboratory approved by the Owner's Representative.

C. Provide analysis of soil samples for pH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

3.03 PREPARATION

A. Clearing of Vegetation:

1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days.

2. Clear and remove existing weeds by mowing or grubbing off all plant parts at least one-quarter inch (¼") inch below surface of soil over entire areas to be planted.

B. Soil preparation:

1. Loosen soil in all planting areas, and on slopes flatter than 3:1 gradient, to a depth of six to eight inches (6" - 8") below finish grade. All debris, foreign matter, and stones shall be removed prior to the placing of any fertilizers or conditioners. Soil preparation is for all shrub planting beds, lawn hydroseeded areas and sodded lawn areas.

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2. Conduct the required soil tests and instruct the lab to include a minimum of the following soil improvements in the recommendation on the soils report.

   a. Soil Amendment: Two cubic yards (2 cy) per 1,000 square feet.

   b. Gro-Power Plus: One hundred fifty pounds (150 lbs) per 1,000 square feet.

   c. If the lab recommends less than six cubic yards (6 cy) of soil amendment, the excess bid amount shall be applied to the cost of any additional recommended soil improvements, or returned to the Owner as a credit

3. Apply amendments as follows, using rates recommended by the soils testing laboratory (the rates of amendments shown below are for bidding purposes only):

   a. Fertilizer/Soil Conditioner: Broadcast 150 pounds of Gro Power Plus per 1,000 square feet in all planting areas and rototill to a depth of six to eight inches (6” - 8”). Remove from the site any rock and debris brought to the surface by cultivations. “Cultipack” all areas to receive sod or hydroseed.

   b. Apply soil amendment to all planting areas at the rate of six cubic yards (6 cy) per 1,000 sf and rototill into the top six to eight inches (6” – 8”).

4. Upon completion of finish grading, request a review and obtain approval of Landscape Architect prior to commencement of planting or hydroseeding.

C. Finish Grading for all Planting areas

1. Refer to Earthwork Specification Section for Rough Grading.

2. Grade to elevations and contours shown on Drawings. Fill low spots with landscape backfill material and grade to surface drain in manner indicated on Drawings.

3. Finish-grade so that the entire area within the contract lines has a natural and pleasing appearance as specified and as directed by Landscape Architect.

4. Adjust sprinkler heads flush to finish grade in preparation to receive hydroseeding or one-half inch above finish grade in preparation to receive sod. Reset sprinkler heads flush to grade after turf has germinated.

5. Flag the sprinkler heads and valve markers.

D. Planting Pits for Trees:

1. Excavate pits with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.

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2. Set container-grown stock in center of pit on earth pedestal. Separate roots and/or prune roots as directed by Landscape Architect. In hot weather, pre-wet pit. Loosen outside roots from sides and bottom of root ball. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Water after placing final layer of backfill.

3. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.

4. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

E. Planting Pits for Shrubs/Groundcover:

1. Excavate pits and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.

2. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.

3. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

3.04 ROOT BARRIER INSTALLATION

A. Root barriers location are specifically shown on the plan. If a tree is moved during construction to a location where root barrier is not shown on the plan, the following minimum requirements are to be met:

1. Install root barrier where trees are planted within sixty inches (60”) of paving or other hardscape elements, such as walls, curbs, and walkways.

2. Install root barrier continuously for a distance of five feet (5’) in each direction from the tree trunk, for a total distance of ten feet (10’) per tree. If trees are spaced closer, use a single continuous piece of root barrier.

B. Align root barrier vertically and run it linearly along and adjacent to the paving or other hardscape elements to be protected from invasive roots.

C. Position top of root barrier just below the top of adjacent hardscape element but above finish grade of the soil so that is visible.

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D. If there are concrete spoils or overpour that is impeding the root barrier from being installed directly adjacent to the hardscape element, the contractor is to remove the extra concrete in a manner that does not damage the integrity of the hardscape element.

E. Do not distort or bend root barrier during construction activities.

F. Do not install root barrier surrounding the root ball of tree.

3.05 PLANTING

A. Lawn Sod:

1. Cultivate all lawn areas to a depth of six inches (6”). If cultivation does not break lumps, pull a spike-toothed harrow over the area behind the tractor.

2. Give all lawn areas that are to be sodded a smooth finish to prevent pockets. Do not allow any abrupt changes of surface. Prior to installation of sod, roll the grade with a 200-pound water-ballast roller. Request that the lawn grade be inspected and approved by the Landscape Architect prior to sodding to determine its suitability for planting. Obtain such approval prior to commencing sodding operations.

3. Do not take heavy objects (except lawn rollers) over lawn areas after they have been prepared for planting.

4. Completely lay the sod within twelve hours (12 hrs.) of delivery. Do not leave sod on pallets in the hot sun longer than necessary.

5. Unroll sod carefully. Lay sod tight without any visible open joints, and without overlapping; stagger end joints twelve inches (12”) minimum. Do not stretch or overlap sod pieces. Do not place sod in pieces smaller than twenty-four inches (24”) in length by width of roll.

6. When new sod is to match existing turf, cut the edge of the existing turf in a series of straight lines that will accept new sod rolls in full width of the sod roll. Make the transition of grade between existing turf and new sod to be seamless with no change in elevation.

7. Immediately after laying sod, roll lawn areas with a 200-pound water-ballast roller.

8. Trim sod to conform to lawn shapes designated in Drawings.

9. On slopes of six inches (6”) per foot and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at a maximum of two feet (2’) on center. Drive pegs flush with soil portion of sod.

10. Ensure that finished appearance is that of one continuous lawn.

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11. Do not lay whole lawn before watering. When a conveniently large area has been sodded, water lightly to prevent drying. Continue to lay sod and to water until installation is complete.

12. All sod areas must be approved by Landscape Architect.

13. Water the complete lawn surface thoroughly. Moisten soil at least eight inches (8”) deep. Repeat sprinkling at regular intervals to keep sod moist at all times until rooted. After sod is established, decrease frequency and increase amount of water per application as necessary.

B. Trees, Shrubs, and Groundcover:

1. Lay out individual tree and shrub locations and areas for multiple plantings. Stake the locations, outline the areas, and secure the Owner’s Representative's acceptance before beginning the planting work. Make minor adjustments as requested.

2. Scarify root ball prior to planting. Plant in holes twice the diameter of the root ball and to a depth equal to the container’s height. Place the shrub and/or groundcover so the top of the root ball is one inch (1”) higher than the surrounding grade; place the tree so that the crown of the trunk is two inches (2") higher than the surrounding grade. Set container-grown stock in center of pit. In hot weather, pre-wet the pit. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Thoroughly compact lower half of backfill in plant pit. See staking or guying detail. Water after planting. Provide a berm or watering basin for each tree. Add Vitamin B-1, in the proper solution as recommended by the manufacturer, to the second watering of the basin.

3. Place fertilizer planting tablets in root zone and alongside each plant. Follow manufacturer's instructions for number of tablets to use for each container size.

4. See Drawings for additional information.

5. Grooming and Staking of Trees:

a. Prune, thin-out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees.

b. Paint cuts over one-half inch (½”) in size with standard tree paint or compound, covering exposed, living tissue. Use paint that is waterproof, antiseptic, adhesive, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants. Do not use shellac.

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c. Stake or guy trees immediately after planting, as indicated on Drawings.

6. Grooming of Shrubs:

a. Prune, thin-out and shape shrubs in accordance with standard horticultural practice. Prune shrubs to retain natural character and to accomplish their use in landscape design. The required plant size is its size after pruning.

b. Remove and replace excessively pruned or malformed new plants resulting from improper pruning.

C. Request review by the Landscape Architect after locating, but prior to planting all trees. Under the direction of the Landscape Architect, make slight adjustments to plant material location as necessary to reflect original intention of Drawings.

3.06 WEED CONTROL

Apply pre-emergent weed control to all planting areas (except lawn) after completion of all planting and one complete watering. Follow manufacturer's directions. To prevent washing away of weed control, do not over-water after its application. Do not allow any weed control into lawn areas. Treat any existing noxious weeds, such as Johnson grass, with Roundup in successive treatments until all roots are destroyed, then remove all grass and roots. Notify Owner’s Representative of time of installation for verification of application.

3.07 BARK MULCH

Apply mulch at the rate of three inches (3") deep to all planting areas, exclusive of lawn, after the planting and weed control are completed. Twelve inches (12”) from planter edges, taper full depth of mulch to meet adjacent grades. Do not place mulch within three inches (3”) of trunk or stems.

3.08 DECOMPOSED GRANITE WITH BINDER

A. General: Prepare all areas to receive decomposed granite, and treat sub-grade with weed control.

B. Placement:

1. Do not install during rainy conditions or below 40 degree Fahrenheit and falling.

2. After pre-blending, place the Stabilized decomposed granite on prepared sub-grade. Level to desired grade and cross section.

3. Install in a maximum depth of two-inch (2") lift at a time.

4. Water heavily for full-depth moisture penetration of the Stabilized pathway profile,

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25 to 45 gallons of water per 1-ton must be applied. During water application randomly test for depth using a probing device, which reaches full depth.

C. Compaction:

1. Upon thorough moisture penetration, compact aggregate screening to 85% relative compaction by equipment such as; a 2 to 4-ton double drum roller or a 1,000-lb. single drum roller. The roller size will depend on the depth of the pathway. DO NOT use a vibratory plate compactor or vibration function on roller as vibration separates large aggregate particles. Do not begin compaction for 6 hours after placement and up to 48 hours.

2. If surface aggregate dries significantly quicker than subsurface material, lightly mist surface before compaction.

3. Take care in compacting decomposed granite when adjacent to planting and irrigation systems. Hand tamping with an 8” or 10” hand tamp recommended.

D. Inspection:

1. Finished surface of pathway shall be smooth, uniform and solid. There shall be no evidence of chipping or cracking. Cured and compacted pathway shall be firm throughout profile with no spongy areas. Loose material will not be present on the surface after installation, but may appear after use and according to environmental conditions. Pathway should remain stable underneath the loose granite on top. Any significant irregularities in path surface shall be repaired to the uniformity of entire installation.

E. Repairs:

1. Excavate damaged area to the depth of the stabilized decomposed granite and square off sidewalls.

2. If area is dry, moisten damaged portion lightly.

3. Pre-blend the dry required amount of Stabilizer powder with the proper amount of decomposed granite in a concrete mixer.

4. Add water the pre-blended decomposed granite and stabilizer. Thoroughly moisten mix with 25 to 45 gallons per 1-ton of pre-blended material or to approximately 10% moisture content.

5. Apply moistened pre-blended decomposed granite to excavated area to finish grade.

6. Compact with an 8”-10” hand tamp or 250 to 300-pound roller. Keep traffic off area for 12 to 48 hours after repair has been completed.

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F. Upon end of landscape maintenance period, all weed/grass shall have been removed and surface re-compacted.

3.09 CLEAN-UP

A. During construction, keep the site free of rubbish and debris, and clean up the site promptly when notified to do so. Take care to prevent spillage on streets from hauling and immediately clean up any such spillage and/or debris deposited on streets due to the work of this Section.

B. During all phases of the construction work, take all precautions to abate dust nuisance by clean-up, sweeping, sprinkling with water, or other means as necessary.

3.10 LANDSCAPE MAINTENANCE

A. The Landscape Maintenance Period will begin when all the Landscape Maintenance Period Requirements have been met (See Part 1 of these Specifications).

B. Cleaning: Maintain cleanliness on paving areas and other public areas used by equipment and immediately remove all spillage. Remove from project site all rubbish and debris found thereon and all material and debris resulting from landscaping work, leaving the site in a safe and clean condition.

C. Maintenance:

1. Sprinkler Irrigation System:

a. Check system weekly for proper operation. Flush lateral lines out after removing last sprinkler head or two at each end of lateral. Adjust all heads as necessary for unimpeded coverage.

b. Set and program automatic controllers for seasonal water requirements. Provide the Owner’s Representative with keys to the controllers and instructions on how to turn off system in case of emergency.

c. Repair all damages to sprinkler irrigation system as part of the contract work. Make repairs within one watering period or one week, whichever is the least amount of time.

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2. Turf Areas:

   a. Begin mowing turf when grass has reached a height of three inches (3") and cut to a height of one and one-half inches to two inches (1 ½" - 2"). Mow at least weekly after the first cut. Turf must be well-established and free of bare spots and weeds, to satisfaction of Landscape Architect, prior to final acceptance. Do not mow lawns when the soil is not able to support maintenance equipment. Repair wheel marks and ruts caused by the maintenance equipment at no additional cost to the Owner.

   b. Pick up grass clippings and remove from the site and premises.

   c. Trim edges at least twice monthly for neat appearance. Vacuum or blow clippings off walks.

   d. Water the lawns at such frequency as weather conditions require to replenish soil moisture below the root zone. Normally, a total of one and one-half inches (1 ½") of water is needed weekly in hot weather.

   e. Fertilize the lawn areas at the beginning of the Landscape Maintenance Period and at the completion of the Landscape Maintenance Period. Use a fertilizer with the following characteristics:

      1.) Slow release, Best 16-6-8, or approved equal, at the rate of 6.25 lbs per 1,000 square feet from March through October.

      2.) Calcium Nitrate (15-0-0) at the rate of 6.5 lbs per 1,000 square feet from November through February.

   f. Broadcast fertilizer using a mechanical spreader; do not apply by hand-broadcasting. Sweep all fertilizer off hardscape into adjacent planters.

   g. Weekly as needed and as directed, re-sod lawn areas with material that matches previously installed material. Use sod to repair any bare areas. Repair areas to receive sod as follows:

      1.) Mark out areas to receive new sod repair.

      2.) Cut straight lines that will accept sod the full width of the roll and a minimum of twenty-four inches (24") in length.

      3.) Transition the grade between existing turf and new sod seamlessly, with no change in elevation.

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3. Trees and Shrubs:

    a. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.

    b. Construct and/or remove water basins around each plant, depending on the time of the year and as directed.

    c. Do not prune unless directed by the Landscape Architect.

    d. Re-stake and re-tie trees as needed and as directed by the Landscape Architect. Do not allow tops of tree stakes to protrude into head of tree.

    e. Replace any dead, dying or vandalized plant material on a weekly basis throughout the Landscape Maintenance Period.

4. Insecticide and Herbicide Application:

    a. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal by Amvac, Balan, or Betasan by Gowan for control prior to crabgrass germination. Control insect pests if necessary.

    b. Use only a licensed Pest Control Operator to apply herbicides and sprays and to maintain a log for applications indicating material, timing, and rate.

5. Decomposed Granite with Binder:

    a. Remove debris, such as paper, grass clippings, leaves or other organic material by mechanically blowing or hand raking the surface as needed.

    b. During the first year, a minor amount of loose aggregate will appear on the paving surface (1/16” to 1/4”). If this material exceeds a ¼”, redistribute the material over the entire surface. Water thoroughly to the depth of 1”. Compact with power roller of no less than 1,000 lbs. This process should be repeated as needed.

    c. If cracking occurs, sweep fines into the crack, water thoroughly and hand tamp with an 8”-10” hand tamp plate.

6. Pre-scheduled On-site Meetings: Hold regularly-scheduled (monthly or bimonthly as determined by the Landscape Architect) on-site meetings with the Landscape Architect, Project Inspector and Owner’s Representative. Dates and times will be jointly agreed upon.

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7. Request, forty-eight hours (48 hrs.) in advance, on-site visits by the Landscape Architect to determine the end of the Landscape Maintenance Period.

END OF SECTION

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PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Domestic water piping system.
2. Fire protection piping systems.
3. Sewer piping system

1.02 RELATED REQUIREMENTS

A. Section 01 5000, Temporary Facilities and Controls.

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

C. Section 01 8113, Sustainable Design Requirements, for CAL-Green [and Collaborative for High Performance Schools (CHPS)] general requirements and procedures.

D. Section 31 0000, Earthwork.

E. Section 31 2333, Trenching and Backfilling.

F. Section 32 1600, Site Concrete.

1.03 REFERENCES AND STANDARDS

A. California Building Code (CBC), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

B. California Green Building Standards Code (CAL Green), edition as noted on the Drawings, as adopted by the California Division of the State Architect (DSA).

C. California Plumbing Code, (CPC), edition as noted on the Drawings.

D. California State Health and Safety Code Section 116875, Lead Free Public Water Systems.

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

F. ASTM International (ASTM):

1. D422-63: Test Method for Particle Size Analysis of Soil.

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2. D698-00: Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
3. D1556-00: Test Method for Density of Soil in Place by the Sand-Cone Method.
4. D1557-02:Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
5. D3017-05: Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by Nuclear Methods (Shallow Depth).
6. D4318-05: Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

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

I. NFPA 13, 24 and 25, latest editions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Submittal Procedures:

1. Action Submittals and Informational Submittals shall be submitted in accordance with Section 01 3300, Submittal Procedures.
2. Closeout Submittals shall be submitted in accordance with Section 01 7700, Closeout Procedures.
3. Sustainable Design Submittals shall comply with the additional requirements of Section 01 8113, Sustainable Design Requirements.

1.05 ACTION SUBMITTALS

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

B. Substitution: Provide all data of proposed material being submitted as a substitution. Provide comparison with specified product data and identify all differences. Failure to provide comparison will be reason for rejection.

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For contractor / installer.

B. Provide sieve analysis from accredited testing lab on pipe bedding material. Analysis shall have a current date not older than project contract signing date.

C. Sustainable Design:

1. General:
   a. Submit information necessary to establish and document compliance with the California Green Building Standards Code.

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b. Sustainable design submittals are in addition to other submittals.

2. The following information shall be provided:

a. Adhesives and Sealants: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

b. Paints and Coatings: Evidence of compliance that products meet maximum VOC content limits specified in Section 01 6116.

1.07 CLOSEOUT SUBMITTALS

A. Guarantee: Submit subcontractor’s guarantee.

B. Water Sterilization Test Report.

1.08 QUALITY ASSURANCE

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

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

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

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

1. Sun damaged or discolored PVC pipe will be rejected.

E. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

1.09 FEES, PERMITS, AND UTILITY SERVICES

A. Obtain and pay for permits and service charges required for installation of Work. Arrange for required inspections and secure written approvals from authorities having jurisdiction.

B. Upon completion of work within right-of-way, provide copies of written final approval to the Architect.

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1.10 DELIVERY, STORAGE AND HANDLING

A. Transport, store and handle in strict accord with the local jurisdiction and manufacturer's written recommendations

B. Deliver undamaged products to job in manufacturer's sealed containers and/or original bundles with tags and labels intact.

1.11 EXISTING SITE CONDITIONS

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

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

1.12 PROTECTION

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

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

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

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

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

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

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

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

1.13 SEASONAL LIMITS

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

1.14 RECORD DRAWINGS

A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.

C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.

D. Properly identify on as-builts and provide dimensions for all stubs for future connections. Provide concrete markers 6” dia. 12” deep, flush with finish grade at the ends of all stubbed pipes.

E. Provide record drawings per Section 01 3300.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Sustainable Design:

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

2.02 MATERIALS - GENERAL

A. Provide each item listed herein or shown on drawings of quality noted or approved equal. All material shall be new, full weight, standard in all respects and in first-class condition. Insofar as possible, all materials used shall be of same brand or manufacture throughout for each class of material or equipment. Materials shall be of domestic manufacture and shall be tested within Continental United States.

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B. Grade or quality of materials desired is indicated by trade names or catalog numbers stated herein.

C. Dimensions, sizes, and capacities shown are minimum and shall not be changed without permission of Architect.

D. All materials in this section used for any public water system or domestic water for human consumption shall be lead free.

1. For the purposes of this section, “lead free” means not more than 0.2 percent lead when used with respect to solder and flux and not more than 8 percent when used with respect to pipes and pipe fittings.
2. All pipe, pipe or plumbing fitting or fixtures, solder, or flux shall be certified by an independent American National Standards Institute (ANSI) accredited third party, including, but not limited to, NSF International, as being in compliance with this section.

E. All materials used for fire system piping shall be UL and FM approved.

2.03 VALVE BOXES

A. Provide at each valve or cock in ground a Christy, Brooks, or equal to Christy G05CT, concrete valve box with cover marked for service, domestic water shall be marked “Water” and fire supply shall be marked “Fire”. Furnish extension handles for each size square nut valve, and provide “fork” handle for each size of “wheel handle” valve as required. Do not locate valve boxes in walk, or covered passages, curbs, or curb & gutters, unless necessary. If valve location is within concrete or asphalt paved surface valve box shall be as detailed on plans for such condition. Provide valve box extensions as required to set bottom of valve box to bottom of piping in which valve is installed. Provide Owner with set of special wrenches and/or tools as required for operation of valves.

2.04 PIPES AND FITTINGS

A. Sanitary Sewer: PVC sewer pipe and fittings with Ring-Tite joints, ASTM D3034 SDR35.

B. Domestic water Lines 3 1/2” and smaller: Type K copper tubing, hard temper, with wrought copper fittings, or Schedule 80 PVC, ASTM D 1784, ASTM D 1785.

C. Water lines 4” and larger: AWWA C-900 Class 150/DR18 with rubber gasket joints.

D. Fire lines 4” and larger: AWWA C-900 Class 200/DR14 with rubber gasket joints.

E. Solder: Lead Free. 95/5; 95% Tin / 5% Antimony.

F. Ductile Iron Pipe; AWWA Class 51, Cement Lined

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G. Ductile Iron Pipe Fittings; AWWA C110, C153, Ebba Iron, Star Romac, Sigma, or approved equal.

H. PVC Mechanical Fittings; Ebba Iron, Star; Romac; Sigma or approved equal.

I. Ductile Iron Pipe/PVC C-900 Pipe Restrained Fittings; Ebba Iron # 3800 Mega Coupling, Ebba Iron 1100CH Split Restrained Harness for pipe couplings. StarGrip Series 4000.

J. Ductile Iron Pipe/PVC C900, C905 Restrained Degreedand Blind Cap Fittings,;

K. Mega Lug; Sigma; Romac; or an approved equal

L. Mechanical Fitting Bolts; Bolts and nuts shall be carbon steel with a minimum 60,000 psi tensile strength conforming to ASTM A 307, Grade A. Bolts shall be standard ANSI B1.1 Class 2A course threads. Nuts shall conform to ASTM A 563 and be standard ANSI B1.1, Class 2A course thread. All bolts and nuts shall be zinc coated.

M. Fasteners Anti-Rust Coatings; After assembly, coat all fasteners with an Asphaltic Bituminous coatings conforming to latest edition NFPA 24.

N. Ductile Iron Pipe Wrap; 8 mil polyethylene pipe wrap conforming to ANSI/AWWA C105/A21.5 standards.

O. Pipe Insulation; Pipe exposed to atmospheric conditions ½" thru 4" NPT; Johns Manville rigid fiberglass insulation, Micro Lok HP; Owens Corning Fiberglas SSL II; Conforming to ASTM C 612, Type 1A or type 1B.

P. Aluminum field applied pipe insulation jacket; comply with ASTM B209, ASTM C1729, ASTM C1371 Manufacturers; Childers Metals; ITW Insulation Systems Aluminum Jacketing; or an approved equal.

1. Finish shall be flat mill finish
2. Factory Fabricated Fitting Covers; 45 and 90 degree elbows, tee's, valve covers, end caps, unions, shall be of the same thickness and finish of jacket.
3. The fittings shall be composed of 2-pieces
4. Adhesives; per the manufacturers requirements
5. Joint Sealant; shall be silicone, and shall be aluminum in color.

2.05 SANITARY SEWER MANHOLES

A. Shall be constructed as shown on plan details.

2.06 CLEANOUTS

A. Cleanouts of same diameter as pipe up to 8" in size shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located not less than 18" from building so as to provide sufficient space for rodding.

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No horizontal run over 100 feet shall be without cleanout whether shown on drawings or not.

B. All cleanout boxes shall be traffic rated with labeled lid, Christy G05CT or approved equal. Lid shall be vandal proof with stainless steel screws

2.07 UNIONS

A. Furnish and install one union at each threaded or soldered connection to equipment and 2 unions, one on each side of valves on pipes ½" to 3".

B. Locate unions so that piping can be easily disconnected for removal of equipment or valve. Provide type specified in following schedule:

Type of Pipe Union

Steel Pipe:	150 lb. Screwed malleable ground joint, brass, brass-to-iron seat, black or galvanized to match pipe.
Copper tubing:	Brass ground joint with sweat connections.
PVC Sch 80 pipe:	PVC union, FIPT X FIPT

2.08 VALVES

A. Provide valves as shown and other valves necessary to segregate branches or units. Furnish valves suitable for service intended. Valves shall be properly packed and lubricated. Valves shall be non-rising stem. Place unions adjacent to each threaded or sweat fitting valve. Install valves with bonnets vertical. All valves shall be lead free.

B. Valves ½" thru 2"; shall be made of bronze, full size of pipe and lead free. Nibco T-585-70 Series: Nibco T 595-Y Series. Brass valves of brass parts within valves will not be accepted.

C. Valves ½" thru 12"; shall be made of carbon steel, full size of pipe and lead free. F-515-CS-Ff-66-FS Series: Nibco T 595-Y. Brass valves of brass parts within valves will not be accepted.

D. Valves, Flanged; 4" thru 12" Ductile Iron Resilient Wedge Gate Valve; Hammond IB641, Hammond IR-1138; Mueller 2360 Series.

2.09 FIRE HYDRANTS

A. Clow 850; Clow 950; AVK 24/70; Jones 4040: Factory Painted or **per Local Jurisdiction Requirements**, or an approved equal, 36" minimum bury, one 2-1/2" hose nozzles

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outlet, one 4-1/2" pumper nozzle outlet, intermediate section to serve as break-off flange with check valve. Hydrant shall conform to, and installation shall comply with the **Local Jurisdiction**.

2.10 POST INDICATOR

A. Post Indicator shall be Mueller Co. A-20806 (adjustable) with tamper switch or approved equal.

2.11 BACKFLOW PREVENTERS
Double Check Valve, Double Check Detector and Reduced Pressure Backflow Preventers

A. **Backflow preventers shall be as approved by the local agency and by the State of California's Department of Health Services** most recent list of approved reduced pressure backflow preventers. All approved backflow preventers shall have ductile iron bodies.

1. Provide Backflow preventer blankets with locking device. Weatherguard R-30 insulated or equal.
2. Provide ball valve at all test ports with brass plug in valve.
3. Provide a minimum of 2 valve tamper switches on fire prevention Backflows.

2.12 TAPPING SLEEVE

A. Shall be used on pipe sizes 6" thru 12" and shall be made with stainless steel material including stainless steel bolts. Flanges shall be ductile iron or high carbon steel. Gaskets shall seal full circumference of pipe. Shall be manufactured for operating pressure of 200 psi, and shall pass test pressure of 300 psi. Romac SST series; Smithblair 662; Mueller H304; Ford "FAST" tapping sleeve.

2.13 SERVICE SADDLES

A. Shall be used on pipe size 2" thru 4". Body shall be made from ductile iron with epoxy coating or bronze. Cascade Style CSC-1; A.Y. McDonald model 3891 AWWA/3892 FNPT; Smith-Blair #317; Ford S70, S71, S90, (style B).

2.14 TRACER WIRE

A. No. 10 THW solid copper wire. Use waterproof splicing kits at all splices. Wire shall extend into all valve boxes as shown on the drawings and to all above ground appurtenances.

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PART 3 - EXECUTION

3.01 DRAWINGS AND COORDINATION

A. General arrangement and location of piping, etc., are shown on Drawings or herein specified. Install work in accord therewith, except for minor changes that may be necessary on account of other work or existing conditions. Before excavation, carefully examine other work that may conflict with this work. Install this work in harmony with other craft and at proper time to avoid delay of work.

B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.

C. In advance of construction, work out minor changes if conflicts occur with electrical or mechanical. Relocate services to suit actual conditions and work of other trades to avoid conflict therewith. Any adjustments or additional fittings to make adjustments shall not be cause for additional costs to the owner.

D. Execute any work or apparatus shown on drawings and not mentioned in specifications, or vice versa. Omission from Drawings or Specifications of any minor details of construction, installation, materials, or essential specialties does not relieve Contractor of furnishing same in place complete.

E. Graded pipes shall take precedence. If conflict should occur while placing the domestic water and fire service piping, the contractor shall provide any and all fittings necessary to route the water lines over such conflicting pipes at no additional costs to the owner.

3.02 ACCESS

A. Continuously check for clearance and accessibility of equipment or materials specified herein to be placed. No allowance of any kind shall be made for negligence on part of Contractor to foresee means of installing his equipment or materials into proper position.

3.03 EXCAVATING AND BACKFILLING

A. Excavation and Bedding:

1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width to be a minimum of 12" wider than outside diameter of pipe. Follow manufacturer's recommendations for use of each kind and type of pipe.
2. Bedding: Provide a bedding as noted on drawing details for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.

B. Laying of Pipe:

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1. General: Inspect pipe prior to placing. Sun damaged pipe will be rejected. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe bell upgrade, true to line and grade.
   a. Sewer pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In any case of discrepancy, work shall be stopped and the discrepancy immediately reported to the Owner's Representatives. In addition, when requested by the Owner's Representative, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than ¼" depression shall result.
   b. The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, prior to trenching for any pipe which may be affected. All costs of such excavation and backfill shall be included in the price paid for the various items of work.
   c. A temporary plug, mechanical type shall be installed on sewer pipe at the point of connection to existing facilities. If connecting to a public facility the plug shall conform to the requirements of the local jurisdiction. This plug shall remain in place until the completion of the balling and flushing operation.
2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.

C. Backfilling:
1. General: Do not start backfill operations until required testing has been accomplished, unless approved by Engineer. If backfilling occurs prior to testing, contractor shall be responsible for all work to locate any deficiencies discovered during the testing procedures.
2. Compaction and Grading: Remainder of backfill shall be in accordance with Section 31 2333 – TRENCHING AND BACKFILLING.
3. If trenching in area previously lime or cement treated backfill top of trench section, same depth as lime or cement treatment with Class 2 Aggregate Base compacted to 95% minimum relative compaction.

3.04 INSTALLATION OF WATER PIPING

A. Immediately cap or plug ends of, and opening in, pipe and fittings to exclude dirt until final connections made. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

B. General: Should existing conditions or other work prevent the running of pipes or the setting of equipment at the points indicated by drawings, changes as authorized by the Architect shall be made without additional cost to the Owner.

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C. All bolts used on mechanical fittings shall be thoroughly coated with an asphaltic bituminous coating conforming to 2007 NFPA 10.3.5.2 and 10.8.3.5.

D. All buried metal shall be incased with 8 mil polyethylene wrap so that no soil is in contact with metal. Ends of polyethylene wrap shall be taped to provide seal with pipe.

E. Do not install water lines in same trench with sewer lines.

F. Under no circumstance shall a fitting be located directly under a structural footing without prior approval from the Architect.

G. In locations where existing domestic pipe is rerouted, the new pipe shall be assembled using restrained fittings at all joints including factory pipe joints. Tapped restrained blind flanges shall be temporarily installed at each end of the assembled pipes until testing and chlorination is completed and approved.

3.05 CLOSING IN OF UNINSPECTED WORK

A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected, tested, and approved. Should work be enclosed or covered up before it has been approved, uncover work at own expense. After it has been inspected, tested and approved, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.06 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in new condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures and trim that are installed as part of this work. Leave systems and equipment in satisfactory new operating condition.

B. Drain and flush piping to remove grease and foreign matter.

C. Sewer piping shall be balled and flushed.

D. Storm drain piping shall be cleaned of all sand and debris..

E. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.

F. Flush fire service piping 3 times in the presence of the project inspector. Each flushing shall be 3 minutes minimum.

3.07 SEWER INTERNAL INSPECTIONS

A. Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which resulted from the new installation, shall also be removed. Pipes shall be cleaned by the controlled balling and flushing method.

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Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility.

B. Provide video inspection for all site sewer piping. An electronic copy of the video inspection shall be provided to the project inspector for review and approval prior to acceptance of the piping.

3.08 TEST OF PIPING

A. Pressure Test piping at completion of roughing-in, in accord with following schedule, and show no loss in pressure or visible leaks after minimum duration or four (4) hours at test pressures indicated.

B. Chlorination tests shall be performed after all fixtures and any required mechanical devices are installed and the entire system is complete and closed up.

C. In cases where new domestic water piping is assembled for re-routing of existing domestic water pipe , the contractor shall perform the following testing prior to connecting the new water pipe to the existing system.

1. The pipe shall be pressure tested and per the test schedule, or **150 psi for two hours.**

2. The pipe shall be pressure tested down within the trench.

3. The contractor shall dig a temporary ditch below the existing pipe to drain to a sump that is lower than the bottom of the trench and to the side of the trench. The sump shall be 30% larger than the total volume of water within the testing pipe assembly.

4. After pressure testing and chlorination has taken place and accepted, the contractor shall drain the pipe into the sump and pump the sump out as it is filling.

5. The temporary test fittings at each end of the pipe assembly shall be removed and the final restrained couplings installed.

6. The existing piping shall be cut and the water within the pipe shall drain below the pipe to the temporary sump. Pump the sump as it is being filled up. Take extreme caution not to contaminate the existing pipe with any contaminates within the trench.

7. Before making the final coupling connections, the restrained couplings at each end of the new pipe shall be thoroughly swabbed inside the fitting with a solution of chlorine mixed with water at a rate of 1 part chlorine to 4 parts potable water.

8. After final connections are made, a visual inspection shall be made after fittings are wiped off. If after 1 hour, no noticeable drips are noted the pipe can be backfilled.

9. The contractor shall flush all water piping affected by chlorination until it is within acceptable levels approved by certified testing lab.

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TEST SCHEDULE

System Tested	Test Pressure PSIG Test With
Public Water Mains	Per local jurisdiction requirements.
Private Domestic Water Piping:	150 psi for 4 hrs.
Fire Protection Piping:	200 psi for 4 hrs duration with no pressure loss.
Sanitary Sewer Piping:	Air test pipe and fittings at 4 psi for 3 minutes with leakage per the manufacturer's recommendations.

D. Testing equipment, materials, and labor shall be furnished by contractor.

3.09 WATER SYSTEM STERILIZATION

A. Public Water Mains: Shall be flushed and disinfected per the local jurisdiction requirements

B. Clean and disinfect all site water systems connected to the domestic water systems in accordance with AWWA Standard C651 and as required by the local Building and Health Department Codes, and EPA.

1. Clean and disinfect industrial water system in addition to the domestic water system.
2. Disinfect existing piping systems as required to provide continuous disinfection upstream to existing valves. At Contractors option, valves may be provided to isolate the existing piping system from the new piping system.

C. Domestic water sterilization shall be performed by a licensed "qualified applicator" as required by CAL-EPA Pesticide Enforcement Branch for disinfecting and sterilizing drinking water.

D. Disinfecting Agent: Chlorine product that is a registered product with Cal-EPA for use in California potable water lines, such as Bacticide, CAL-EPA Registration No. 37982-20001.

E. Contractor to provide a 1" service valve connected to the system at a point within 2'-0" of its junction with the water supply line. After sterilization is complete Contractor to provide cap at valve.

F. Sterilization Procedure to be as follows:

1. Flush pipe system by opening all outlets and letting water flow through the system until clear water flows from all outlets.

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2. Inject disinfecting agent to provide a minimum chlorine residual concentration of at least 50 parts per million (ppm) of free chlorine at each outlet.
3. Provide sign at all outlets which reads “Water Sterilization in Progress – Do not operate”. Remove signs at conclusion of test.
4. Close all outlets and valves, including valve connecting to water supply line and 1” service valve. Retain treated water in pipe for a minimum of twenty-four hours. Should chlorine residual at pipe extremities be less than 50 PPM at this time, pipe shall be re-chlorinated. As an option, the water systems may be filled with a water-chlorine solution containing a minimum of 200 PPM of chlorine and allowed to stand for three hours.
5. After chlorination, flush lines of chlorinated water and refill from domestic supply. Continue flushing until residual chlorine is less than or equal to 0.2 ppm, or a residual the same as that of the test water.

G. Chemical and bacteriological tests shall be conducted by a state-certified laboratory and approved by the local authorities having jurisdiction.

H. Submit written report to Health Department as required by State Regulations. Provide a copy of report to Architect prior to completion of project.

I. The costs of sterilization and laboratory testing shall be paid for by the contractor.

J. Chlorinated water disposal is the responsibility of the contractor. If allowed by the local jurisdiction, water can be disposed in the sewer system. Ground disposal will be allowed with proper permits. Either of these methods will require a de-chlorination procedure with diffuser.

3.10 CLEANING

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

END OF SECTION

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