

Rancho Buena Vista High School – Track and Field Replacement

Vista Unified School District

Bid#: V2526018RFQP

04-122827

ADDENDUM 01-LLB

December 9, 2025

The following is issued to supplement or revise the Contract Documents. The revisions to the documents are described below. Unless specifically changed by this addendum, the remainder of the drawings, documents, specifications, and bid date/time shall remain in effect as originally issued.

PRE-BID RFIS

- RFI #1. Question: Please provide district standard turf and track manufacturer and model.
Answer: Refer to Specification Sections 32 1823 & 32 1823.10.
- RFI #2. Question: Sheet A-103 Note 20 indicates a new 4' chain link fence at existing retaining wall, however Sheet F-150 fencing plan does not indicate new fencing at this location. Please confirm if fencing is to occur at north-west corner of track and field as detailed by Note 20 on A-103. If new fencing is to occur, please confirm existing fence posts shall remain in existing retaining wall.
Answer: New fencing shall occur as noted on A-103. Refer to details 11 & 14/A-105 for location of new fencing in relation to the retaining wall.
- RFI #3. Question: Please provide grind & overlay detail per Sheet C-101 Note 10.
Answer: Please see Attachment #1 for sawcut, grind and overlay detail.
- RFI #4. Question: Please provide electrical plans and specifications for the installation of the new light pole per Note 25 on Sheet A-101.
Answer: Please see Attachment #3, DSA Approved Addendum 01, which includes electrical drawings and specifications.
- RFI #5. Question: Please confirm all demolished truncated domes specified by Note 25 on 1/A-104 are to be replaced with new truncated domes per 2/A-104. At existing truncated domes, please confirm if contractor is responsible for verifying compliance.
Answer: Truncated domes to be demolished shall not be replaced. Patch and repair location of removal as necessary. Per General Construction Note #3 on T-002, "The contractor shall verify all existing conditions prior to the start of work."
- RFI #6. Question: Please confirm if contractor is responsible for verifying the 2% slopes at accessible drop off per 3/A-104.
Answer: Per General Construction Note #3 on T-002, "The contractor shall verify all existing conditions prior to the start of work."
- RFI #7. Question: Please confirm if refinishing striping at north and south parking lots is within scope of work.
Answer: Refer to Enlarged Parking Plan (11/A-104 & 16/A-105) keynotes for parking lot scope of work.
- RFI #8. Question: The terms Construction Manager and Contractor are both used throughout the RFQ/P. Please confirm that where the term Construction Manager is used, it is the same as Contractor or the LLB Contractor.
Answer: Where the term "Construction Manager" and "Contractor" are referenced in the RFQ/P, they refer to separate roles and responsibilities. The LLB Contractor will be a separately procured entity responsible for construction, while

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PPC will provide construction management and oversight services on behalf of the District.

RFI #9. Question: Is there a PLA agreement associated with this project?

Answer: No, there is no PLA agreement associated with this project.

RFI #10. Question: Item 6 Compensation, states to provide GMP proposed costs for Phase I and Phase II projects separately. Is this phasing referring to Pre-Construction and Construction pricing or will the project be phased?

Answer: There is no phasing planned for this project. Preconstruction services will be a separate contract if necessary.

RFI #11. Question: In the northwest corner note 11 existing wall (in green A-103 questions) is the new fence on the wall or behind it or on the wall is it to be core drilled?

Answer: New fence shall be behind the wall per details 11 & 14/A-105.

RFI #12. Question: In the northwest corner (in yellow) is there going to be a fence behind the wall like detail 14/A-105?

Answer: Yes.

RFI #13. Question: Southside (in blue A-103) at visitor bleachers is that area new fence?

Answer: Yes.

RFI #14. Question: Detail 11/A-106 calls out detail 10/A-106 the existing fence is all welded should we use slider per detail 10?

Answer: New fencing shall match existing.

RFI #15. Question: Gates G1 are single gates called out on the gate schedule per detail 13/A-106 that is incorrect they should be more like detail 9/A-106.

Answer: No. G01 is a single leaf steel maintenance gate per 13/A-106.

RFI #16. Question: All the open areas on A-103 on the filled fence show (8) 4' openings and (2) 6' openings, should those areas have gates?

Answer: No.

RFI #17. Question: Please provide the job walk sign-in sheet for the walk of the Rancho Buena Vista HS T&F RFP LLB Project.

Answer: Please see Attachment #2 for the job walk sign-in sheet.

RFI #18. Question: Do we need to include *EXHIBIT D TO LEASE-LEASEBACK AGREEMENT GMP AND PROJECT COMPLETION SCHEDULE* into the proposal?

Answer: No, these sections are due at LLB Contract signature phase.

RFI #19. Question: *EXHIBIT E TO LEASE-LEASEBACK AGREEMENT PROJECT FORMS* into the proposal?

1. Notice to Proceed
2. Worker's Compensation Certification
3. Drug-Free Workplace Certification
4. Contractor's Certificate Regarding Alcoholic Beverage and Tobacco-Free Campus Policy
5. Asbestos-Free Materials Certification

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6. Performance Bond
7. Labor and Material Payment Bond
8. Contractor & Subcontractor Fingerprinting Requirements
9. Acknowledgement of Project Schedule
10. Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion
11. Iran Contracting Act Certification
12. Substitution Request Form
13. California Air Resources Board Compliance Certification
14. Contractor's Certificate Regarding Participation of Disabled Veteran Business Enterprises, if applicable.

Answer: No, these sections are due at LLB Contract signature phase.

RFI #20. Question: EXHIBIT C TO LEASE-LEASEBACK AGREEMENT GENERAL CONSTRUCTION PROVISIONS forms we need to complete, signed and include in the proposal?

Answer: No, Exhibit C is due at LLB Contract signature phase.

RFI #21. Question: Do we need to have experience working with the design architect? See question (Page 21). Does this eliminate our opportunity to submit for a proposal?

Answer: No previous experience working with the design architect is required.

RFI #22. Question: At the northwest corner of the track, Note 19 on Sheet A-102 and Note 25 on Sheet A-101 calls for the demolition of existing light pole. It was observed on the 12/2/25 job walk that there is a flagpole and a light pole at this location. Please clarify the demolition intention.

Answer: Flagpole shall remain in place during construction. Light pole and all related appurtenances shall be removed as noted in electrical drawings. Please see Attachment #3, DSA Approved Addendum 01.

RFI #23. Question: Notes 17 and 18 on Sheet A-501 call for new stainless steel grab bars and new partition doors at the Home and Visitor's Restrooms. Please provide specifications for the make/model of the grab bar and the toilet partition doors.

Answer: Specifications for toilet partitions will be issued after LLB bid is awarded.

RFI #24. Question: Please confirm all sports equipment and sports equipment storage containers will be removed prior to contract start date.

Answer: Yes, all sports equipment and storage containers will be removed or slated for demo/disposal prior to contract start date.

RFI #25. Question: There are discrepancies between the keynotes on the demolition plans A-102 and F-002. Please clarify which plans should be followed.

Answer: Discrepancies clarified in addenda which will be issued after LLB bid is awarded.

RFI #26. Question: The gate numbering on sheets A-103 and F-120 are different with A-103 having two gates G01 and two gates G02. Please advise.

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Vista Unified School District

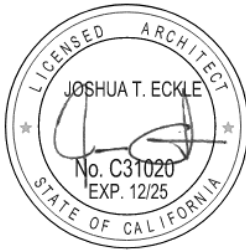
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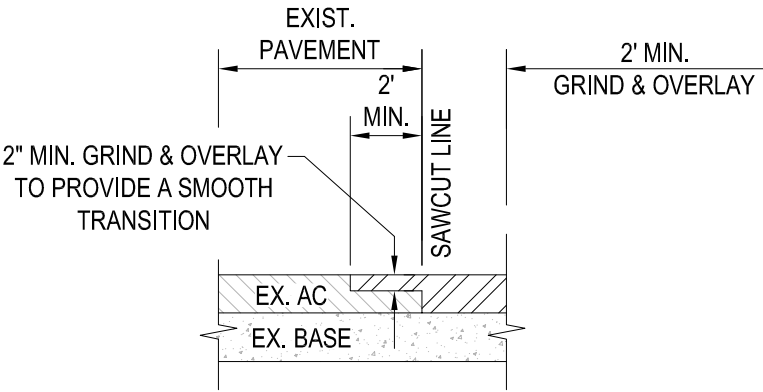
04-122827

ADDENDUM 01-LLB

December 9, 2025

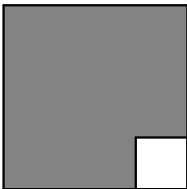
- Answer: A-103 and A-901 shall be followed for all gate numbering.
- RFI #27. Question: Please confirm that pre-construction pricing should include a GPM bidding effort only and no milestone estimates are required?
Answer: Confirmed, pre-construction pricing should include a GMP bidding effort only. No milestone estimate is required.
- RFI #28. Question: Would (1) double wide trailer including space for construction team, IOR, and Bond Program manager be acceptable or should general contractors include (3) single wide trailers as suggested in the temporary facilities specification section 015000 1.3.
Answer: (1) Double wide trailer including space for the construction team and (1) single wide trailer for the IOR and Bond Program Manager is recommended for this project.





SAWCUT, GRIND AND OVERLAY

SCALE: NTS



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6152 INNOVATION WAY CARLSBAD
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PRE-BID RFI #3
SAWCUT, GRIND AND
OVERLAY DETAIL
SCALE: NTS

DATE:
12/8/2025

ATTACHMENT #2 JOB WALK SIGN IN SHEET



V2526018RFQP
RBVHS TRACK & FIELD REPLACEMENT
PROPOSALS DUE: December 17, 2025 by 2 p.m.
In Purchasing Department-1234 Arcadia Avenue

This pre-bid is mandatory.

COMPANY NAME Please print legibly	REPRESENTATIVE Please print legibly	PHONE/E-MAIL Please print legibly-ESPECIALLY EMAIL
Bernards	PAUL J Foster	Pfoster@bernards.com
Flint Builders	MARK Lechuga	mlechuga@FlintBuilders.com
FEULECORP	Brian Jarvis	b.jarvis@PenceCDP.org
SOLTEK PACIFIC	WESTON MC HALE	WMCHALE@SOLTEKPACIFIC.COM
Swinerton	Stephanie Foy	sfoye@swinerton.com
SWINERTON	SIMON POLLARD	SIMON.POLLARD@SWINERTON.COM
PROWEST CONSTRUCTORS	JASON DANA	BID@GOPROWEST.COM



JOB WALK SIGN IN SHEET

V2526018RFQP

RBVHS TRACK & FIELD REPLACEMENT

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This pre-bid is mandatory.

COMPANY NAME Please print legibly	REPRESENTATIVE Please print legibly	PHONE/E-MAIL Please print legibly-ESPECIALLY EMAIL
ASPHALT FABRIC + ENGINEERING	MICHAEL ROGERS	562-997-4129 ESTIMATING@ASPHALTFABENG.COM
NEFF Construction	MIKE RIKER	909-241-7804 MR. RIKER@NEFFCON.COM
Byrom-Davey	Christine Butler	858-583-1137 ericj@byrom-davey.com
Byrom-Davey	Trent Butler	858-513-7199 estimating@byrom-davey.com
Bernards	Nicole Sandoval	818-322-8361 nsandoval@Bernards.com
BERNARDS	Frank Lechuga	909-481-8322 FLECHUGA@Bernards.com
BERNARDS	EDYTA MAKOSW	619-366-6948 EMAKOSW@BERNARDS.COM



JOB WALK SIGN IN SHEET

V2526018RFQP

RBVHS TRACK & FIELD REPLACEMENT

PROPOSALS DUE: December 17, 2025 by 2 p.m.

In Purchasing Department-1234 Arcadia Avenue

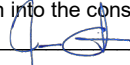
This pre-bid is mandatory.

COMPANY NAME Please print legibly	REPRESENTATIVE Please print legibly	PHONE/E-MAIL Please print legibly-ESPECIALLY EMAIL
Taylor Sports	Mark Dyer	mduy@taylor-sports.com
TCLM TCLM Construction Management	Daniel Lien	~~dan@tclm.com~~ 714-656-7315
Barnhart Reese Construction	David Lozano	858-592-6500 dlozano@barnhartreese.com bids@barnhartreese.com
The K9A Group	David DiGerardino	760-413-4313 David.DiGerardino@TheK9agroup.com

APPLICATION FOR SUBMITTAL OF POST-APPROVAL DOCUMENT

This application is for submittal of documents, after the initial approval of the project (post-approval documents), that require Division of the State Architect (DSA) review and approval. This form shall be completed by the Design Professional in General Responsible Charge of the project, in accordance with California Code of Regulations, Title 24, Part 1, Sections 4-317, 4-323 and 4-338 and in compliance with DSA IR A-6: Construction Change Document Submittal and Approval Process.

DSA documents referenced within this form are available on the [DSA Forms](#) or [DSA Publications](#) webpages.

1. SUBMITTAL TYPE: (Is this a resubmittal? Yes ☒ No ☐)			
Deferred Submittal ☐	Addendum Number: 01	Revision Number:	CCD Number: Category A ☐ or B ☐
2. PROJECT INFORMATION:			
School District/Owner: Vista Unified School District		DSA File Number: 37 H12	
Project Name/School: Rancho Buena Vista HS Track and Field Replacement		DSA Application Number 04 122827	
3. APPLICANT INFORMATION:			
Date Submitted: 09/30/25		Attached Pages? No ☐ Yes ☒ Number of pages? 46	
Firm Name: AlphaStudio Design Group		Contact Name: Alex Pullen	
Work Email: alex@alphastudio-design.com		Work Phone: (760) 431-2444	
Firm Address: 6152 Innovation Way		City: Carlsbad	State: CA Zip Code: 92009
4. REASON FOR SUBMITTAL: (Check applicable boxes)			
☒ For revision or addendum prior to construction.		☐ For a project currently under construction.	
☐ For a project that has a form DSA 301-N: Notification of Requirement for Certification, DSA 301-P: Posted Notification of Requirement for Certification or a 90-Day Letter issued.			
☐ To obtain DSA approval of an existing uncertified building or buildings.			
☐ For Category B CCD this is: ☐ a voluntary submittal, ☐ a DSA required submittal (attach DSA notice requiring submission).			
5. DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE:			
Name of the Design Professional In General Responsible Charge: Josh Eckle			
Professional License Number: C31020		Discipline: Architect	
Design Professional in General Responsible Charge Statement: The attached post-approval documents have been examined by me for design intent and appear to meet the appropriate requirements of Title 24, California Code of Regulations and the project specifications. They are acceptable for incorporation into the construction of the project. Signature: 			
DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE			
6. CONFIRMATION, DESCRIPTION AND LISTING OF DOCUMENTS:			
For addenda, revisions, or CCDs: CHECK THIS BOX ☒ to confirm that <i>all</i> post-approval documents have been stamped and signed by the Responsible Design Professional listed on form DSA 1: Application for Approval of Plans and Specifications for this project. (For Deferred Submittals, refer to IR A-18: Use of Construction Documents Prepared by Other Professionals, and IR A-19: Design Professional's Signature and Seal (Stamp) on Construction Documents, when applicable, for signature and seal requirements.)			
Provide a brief description of construction scope for this post-approval document (attach additional sheets if needed): Addendum 01 includes scope modifications per the attached drawings. Please refer to the Narrative for full description of the included revisions.			
List of DSA-approved drawings affected by this post-approval document: T-001			

DSA USE ONLY		
SSS <u>OI</u> Date <u>10/06/2025</u> ☒ Approved ☐ Disapproved ☐ Not Required Comments: _____ FLS _____ Date _____ ☐ Approved ☐ Disapproved ☒ Not Required Comments: _____ ACS _____ Date _____ ☐ Approved ☐ Disapproved ☒ Not Required Comments: _____	Returned Date: <u>10/08/2025</u> By: <u>DP</u>	DSA STAMP APPROVED DIV. OF THE STATE ARCHITECT APP: 04-122827 INC: REVIEWED FOR SS ☒ FLS ☐ ACS ☐ DATE: <u>10/06/2025</u>

Rancho Buena Vista High School – Track and Field Replacement

Vista Unified School District

ADDENDUM 01

September 29, 2025

The following is issued to supplement or revise the Contract Documents. The revisions to the documents are described below. Unless specifically changed by this addendum, the remainder of the drawings, documents, specifications, and bid date/time shall remain in effect as originally issued.

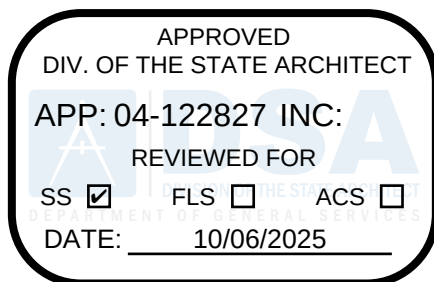
DRAWINGS

- Item #1. ADDITION – Title Sheet T-001
a. Added electrical drawings to sheet index.
- Item #2. ADDITION – Electrical Drawings E-1.0 – E-1.5
a. Added electrical drawings per attachments. The general scope of electrical drawings includes the design of the site power and low voltage systems in and around the track and field. Additional scope includes the connection of the sound system mic on the field and the routing of spare conduits from home bleacher booth to future scoreboard.

SPECIFICATIONS

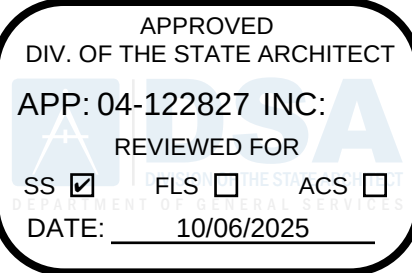
- Item #1. ADDITION – Electrical Specification Sections 26 0100 – 26 9090
a. Added new specification sections for electrical scope of work.

Attachments: Addition/Revision drawings: T-001, E-1.0, E-1.1, E-1.2, E-1.3, E-1.4, E-1.5
Specification Sections: 26 0100, 26 0519, 26 0526, 26 0533, 26 0534, 26 0543, 26 2416, 26 9090

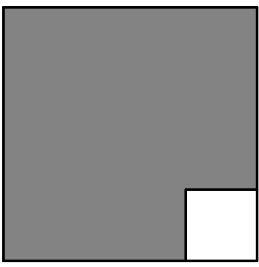


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TRACK AND FIELD REPLACEMENT RANCHO BUENA VISTA HIGH SCHOOL

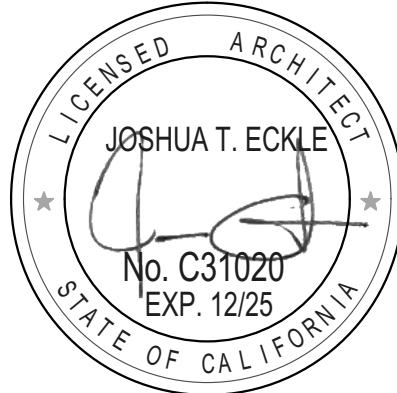


ALPHASTUDIO DESIGN GROUP



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CARLSBAD, 92009
760-431-2444
www.alphastudio-design.com

ARCHITECT OF RECORD



ENGINEER OF RECORD

SHEET INDEX

SHEET TOTAL 158

ARCHITECTURAL

COVER SHEET & GENERAL INFO

T-001 COVER SHEET
T-002 APPLICABLE CODES AND GENERAL NOTES
T-003 ABBREVIATIONS AND TYPICAL SYMBOLS

CIVIL

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C-101 PRECISE GRADING PLAN
C-102 PRECISE GRADING PLAN - DETAILS
C-103 EROSION CONTROL PLAN
C-104 DETAILS

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A-102 ENLARGED SITE DEMOLITION PLAN
A-103 ENLARGED SITE NEW WORK PLAN
A-104 ENLARGED PARKING PLAN - SOUTH & SITE DETAILS
A-105 ENLARGED PARKING PLAN - NORTH & SITE DETAILS
A-106 GATE DETAILS
A-107 GATE DETAILS
A-108 SIGNAGE DETAILS

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A-502 RESTROOM DETAILS
A-503 RESTROOM DETAILS

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A-901 GATE SCHEDULE

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S002 TYPICAL DETAILS

ELECTRICAL

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E-1.1 OVERALL SITE PLAN
E-1.2 ENLARGED SITE PLAN
E-1.3 ELECTRICAL SITE DETAILS
E-1.4 SITE ELECTRICAL DETAILS
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F-100 COLOR LAYOUT PLAN
F-110 ATHLETIC FIELD & TRACK LAYOUT PLAN
F-120 ATHLETIC FIELD & TRACK GRADING PLAN
F-130 ATHLETIC FIELD & TRACK DRAINAGE PLAN
F-140 ATHLETIC FIELD & TRACK WASHWATER & IRRIGATION PLAN
F-150 ATHLETIC FIELD & TRACK FENCING PLAN
F-160 ATHLETIC FIELD & TRACK DIMENSIONING PLAN
F-210 FIELD & TRACK SECTION DETAILS
F-220 FIELD & TRACK DRAINAGE DETAILS
F-221 FIELD & TRACK DRAINAGE DETAILS
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F-240 FIELD & TRACK DETAILS
F-241 FIELD & TRACK DETAILS
F-250 FIELD EVENT DETAILS
F-251 FIELD EVENT DETAILS
F-260 IRRIGATION & WASHWATER DETAILS
F-261 IRRIGATION & WASHWATER DETAILS
F-310 COMPOSITE LAYOUT PLAN & DETAILS
F-320 FOOTBALL LAYOUT PLAN & DETAILS
F-330 SOCCER LAYOUT PLAN & DETAILS
F-340 LACROSSE LAYOUT PLANS
F-350 FIELD HOCKEY AND FLAG FOOTBALL LAYOUT PLAN
F-360 END ZONE LETTERS & CENTER FIELD LOGO
SFPC-1 GENERAL NOTES AND DSA FORM 103
SFPC-2 GENERAL NOTES ABBREVIATIONS AND SYMBOLS
SFPC-3 SECTIONS AND DETAILS
SFPC-4 SPORTFIELD SPECIALTIES DETAILS

PROJECT DIRECTORY

CLIENT:
VISTA UNIFIED SCHOOL DISTRICT
1234 ARCADIA AVENUE
VISTA, CA 92084

ARCHITECT:
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CARLSBAD, CA 92009
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CIVIL:
PASCO LARET SUITER & ASSOCIATES
27127 CALLE ARROYO SUITE 1904
SAN JUAN CAPISTRANO, CA 92121
P: 949-661-6695

STRUCTURAL:
WISEMAN & ROHY STRUCTURAL
ENGINEERS
9915 MIRA MESA BLVD
SAN DIEGO, CA 92131
P: 858-536-5166

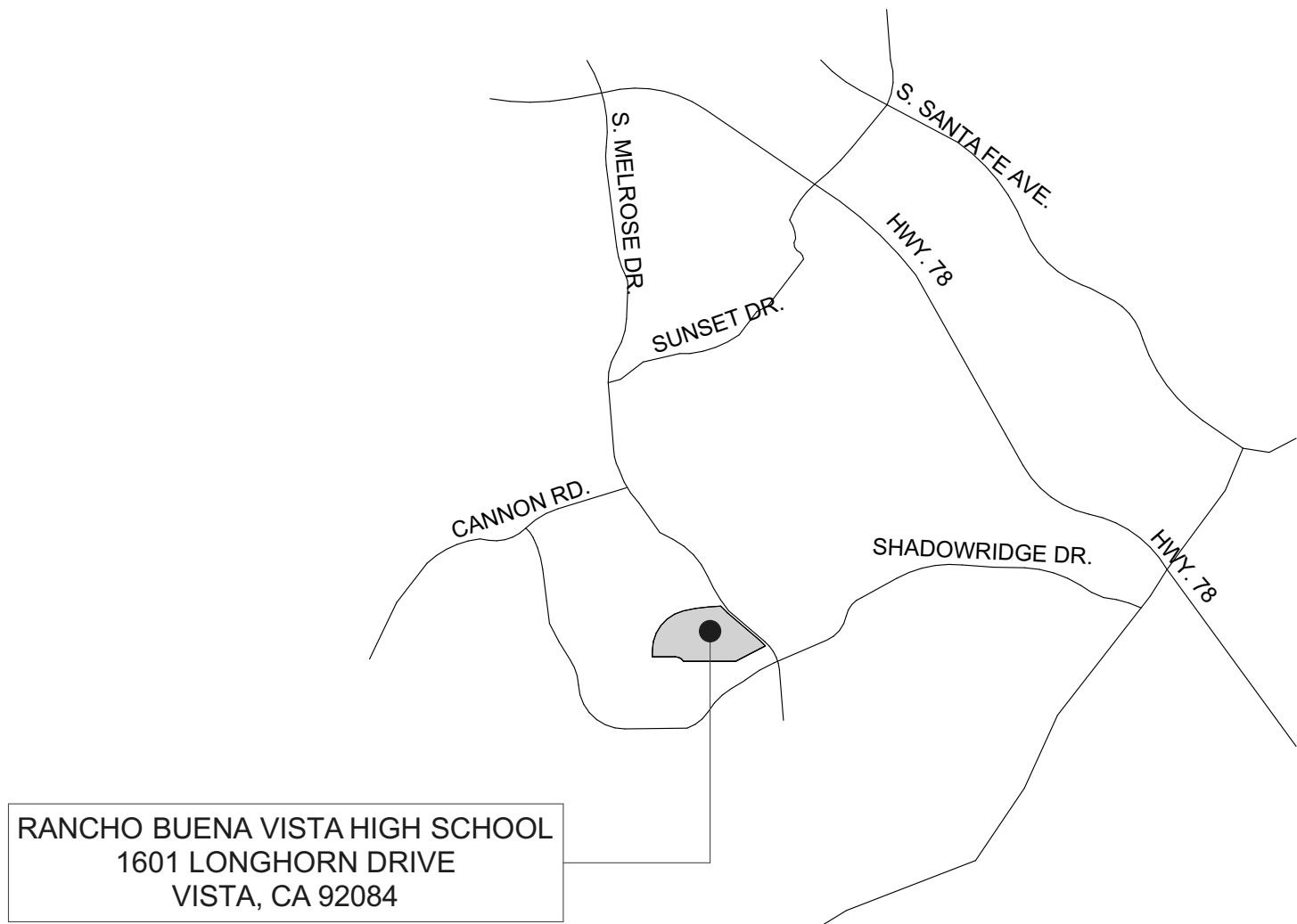
LANDSCAPE:
D A HOGAN & ASSOCIATES
1450 114TH AVE. SE, SUITE 225
BELLEVUE, WA 98004
P: 206-285-0400

ELECTRICAL:
JOHNSON CONSULTING
ENGINEERS
12875 BROOKPRINTER PLACE
POWAY, CA 92064
P: 858-679-4030

PROJECT SCOPE

THE SCOPE OF THIS PROJECT INCLUDES THE DEMOLITION AND REPLACEMENT OF THE EXISTING SYNTHETIC TRACK AND ARTIFICIAL TURF FIELD. NEW WORK ALSO INCLUDES A RETAINING WALL WITH DRAINAGE, NEW CONCRETE PAVING WITH AN AGGREGATE BASE, AND A GRIND, SLURRY COAT AND SEAL OF EXISTING AC PAVING.

VICINITY MAP



Statement of General Conformance FOR ARCHITECTS/ENGINEERS WHO UTILIZE PLANS. INCLUDING BUT NOT LIMITED TO SHOP DRAWINGS, PREPARED BY OTHER LICENSED DESIGN PROFESSIONALS AND/OR CONSULTANTS

(Application No. A#04-122827 File No. 37-H12)

- ☒ The drawings or sheets listed on the cover or index sheet
☐ 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])

I find that: ☒ All drawings or sheets listed on the cover or index sheet ☐ This drawing or page	
☒ is/are in general conformance with the project design intent, and ☒ has/have been coordinated with the project plans and specifications.	☐ is/are in general conformance with the project design intent, and ☐ has/have been coordinated with the project plans and specifications.
Signature JOSH ECKLE Date 5/20/24	Signature Date
Architect or Engineer designated to be in general responsible charge	Architect or Engineer delegated responsibility for this portion of the work
Print Name JOSH ECKLE	Print Name
License Number C31020	Expiration Date 12/25
License Number	Expiration Date

TRACK AND FIELD
REPLACEMENT
RANCHO BUENA VISTA HIGH SCHOOL
1601 LONGHORN DRIVE
VISTA, CA 92081
VISTA UNIFIED SCHOOL DISTRICT
1234 ARCADIA AVENUE VISTA CA 92084

REVISIONS

MARK	DATE	DESCRIPTION
01 ADD	9/30/25	ADDENDUM 01

PROJECT NO: 23-015

MODEL FILE:
23-015 RBVHS Track and Field Replacement.pln

PLOT DATE:
10/2/2025

SHEET TITLE

COVER SHEET

T-001

ABBREVIATIONS

A	AMPERE (AMPS)
AC	ALTERNATING CURRENT
AF	AMPS-FRAME (RATING)
AI	AMP INTERRUPTING CURRENT
AM	AMMETER
AS	AMP SWITCH (FUSED SWITCH RATING)
AT	AMPS-TRIP (RATING)
AWG	AMERICAN WIRE GAUGE
BC	BARE COPPER
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
CO	CONDUIT ONLY
CT	CURRENT TRANSFORMER
CU	COPPER
CFOI	CONTRACTOR FURNISHED OWNER INSTALLED
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DWG	DRAWING
EX	EXISTING
FLA	FULL LOAD AMPS
FVR	FULL VOLTAGE REVERSING
FVNR	FULL VOLTAGE NON-REVERSING
GFI	GROUND FAULT INTERRUPTER
GRD/GND	GROUND
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HZ	HERTZ
KM	KILOMATT
LCL	LONG CONTINUOUS LOAD
LRA	LOCKED ROTOR AMPS
LTS	LIGHTING
MCC	MOTOR CONTROL CENTER
MCM (KCM)	THOUSAND CIRCULAR MILS
MECH	MECHANICAL
NC	NORMALLY CLOSED
NF	NON-FUSED
NO	NORMALLY OPEN/NUMBER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
P	POLE
PH	PHASE
POC	POINT OF CONNECTION
PRS	PVC COATED RIGID STEEL (CONDUIT)
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE DUCT
SWBD	SWITCHBOARD
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
V	VOLT
VA	VOLTAMPERES
VM	VOLTMETER
VL	VERIFY LOCATION
W	WIRE/MATTS
WP	WEATHERPROOF (NEMA TYPE 3R)
WT	WATERTIGHT
XP	EXPLOSION PROOF (RATED FOR AREA HAZARD)

ELECTRICAL SYMBOL LEGEND

POWER	
	DUPLEX RECEPTACLE, WALL MOUNTED, +18" A.F.F. (U.O.N.)
	RECEPTACLE, WALL MOUNTED HORIZONTALLY, +18" A.F.F. (U.O.N.)
	FOURPLEX RECEPTACLE, WALL MOUNTED, +18" A.F.F. (U.O.N.)
	RECEPTACLE MOUNTED +6" ABOVE COUNTER BACKSPLASH SEE ARCHITECTURAL PLANS FOR REQUIRED MOUNTING HEIGHT PRIOR TO ROUGH-IN.
	SWITCH CONTROLLED DUPLEX RECEPTACLE +18" U.O.N.
	CONTROLLED FOURPLEX RECEPTACLE +18" U.O.N. (1) DUPLEX, (1) HALF HOT CONTROLLED DUPLEX. SEE LIGHTING CONTROL DIAGRAMS FOR FURTHER INFO.
	DUPLEX GROUND FAULT INTERRUPTING RECEPTACLE +18" A.F.F. (U.O.N.)
	DUPLEX RECEPTACLE IN WEATHERPROOF ENCLOSURE +18" A.F.F. (U.O.N.)
	DUPLEX RECEPTACLE IN WEATHERPROOF "LOCKING" ENCLOSURE +18" A.F.F. (U.O.N.) (SEE TYPICAL DETAILS ES SERIES SHEETS AND SPECIFICATIONS FOR REQUIRED TYPE).
	DUPLEX RECEPTACLE SAFETY TYPE / TAMPER PROOF WALL MOUNTED +18" A.F.F. (U.O.N.)
	DUPLEX COMPUTER RECEPTACLE (BLUE) ISOLATED GROUND, SURGE SUPPRESSION, WALL MOUNTED +18" A.F.F. (U.O.N.)
	SINGLE RECEPTACLE 30 AMP, 250V, 4W, GROUNDING, WALL MOUNTED +18" A.F.F. (U.O.N.). FIELD VERIFY EXACT OUTLET CONFIGURATION WITH EQUIPMENT PRIOR TO ROUGH-IN.
	DUPLEX RECEPTACLE, WALL MOUNTED ADJACENT TO FLAT PANEL OUTLET, SEE SIGNAL PLAN FOR EXACT LOCATION.
	JUNCTION BOX, CEILING OR WALL MOUNTED
	HAND DRYER CONNECTION, SEE ARCHITECTURAL FOR MOUNTING HEIGHT.
	FUSED DISCONNECT SWITCH, WHERE SHOWN NF = NON-FUSED.
	MANUAL MOTOR STARTER WITH OVERLOAD PROTECTION +48" A.F.F. OR ON EQUIPMENT (U.O.N.)
	MOTOR CONNECTION, NUMERAL INDICATES HORSEPOWER.
	MECHANICAL EQUIPMENT TAG (SEE MECHANICAL DRAWINGS FOR DESCRIPTION)
	CONDUIT AND WIRE, CONCEALED IN CEILING OR WALL
	CONDUIT AND WIRE, CONCEALED IN OR UNDER FINISHED FLOOR OR UNDER FINISHED GRADE.
	FLEXIBLE CONDUIT CONNECTION
	BRANCH CIRCUIT HOMERUN TO PANEL, SLASHES INDICATE NUMBER OF CONDUCTORS. EQUIPMENT GROUND WIRE NOT INDICATED U.O.N. #12 CONDUCTORS ARE MINIMUM, NO HASH MARKS = MIN (2) #12
	3/4" CONDUIT STUBBED FROM DEVICE TO ABOVE ACCESSIBLE CEILING
	BRANCH CIRCUIT HOMERUN, NUMBER INDICATES INCREASED CONDUCTOR SIZE, CONDUCTORS SHALL REMAIN AS INDICATED FOR SIZE THROUGHOUT THE ENTIRE CIRCUIT.
	PANELBOARD, SURFACE MOUNTED.
	PANELBOARD, RECESSED
	STEP-DOWN TRANSFORMER
	DISTRIBUTION SWITCHBOARD

GENERAL PROJECT NOTES:

- UNLESS WHERE OTHERWISE NOTED, ALL WORK INDICATED ON THESE DRAWINGS SHALL BE CONSIDERED NEW WORK.
- UNLESS WHERE OTHERWISE NOTED, ALL DIMENSIONS ARE TO BE CENTERLINE OF THE DEVICE.
- "GENERAL NOTES" SHOWN ON AN INDIVIDUAL DRAWING APPLY TO ALL WORK SHOWN ON THAT SHEET. "KEY NOTES" ONLY APPLY TO SPECIFIC ITEMS WHERE ANNOTATED AT SPECIFIC LOCATIONS. SOME KEY NOTES MAY NOT APPLY TO ANY SPECIFIC ITEMS.
- UNLESS SPECIFICALLY SHOWN ON THESE PLANS, NO STRUCTURAL MEMBER SHALL BE CUT, NEITHER DRILLED NOR NOTCHED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER AND THE DIVISION OF THE STATE ARCHITECT.

GENERAL DEMOLITION NOTES:

- ALL ELECTRICAL EQUIPMENT, EXPOSED RACEWAY AND CONDUIT, OUTLET BOXES AND RINGS, AND DEVICES ARE TO BE REMOVED, EXCEPT WHERE SHOWN TO REMAIN. EXISTING WIRING, WHETHER EXPOSED, IN CONDUIT OR RACEWAY IS TO BE REMOVED TO THE GREATEST EXTENT POSSIBLE.
- THE ELECTRICAL CONTRACTOR IS TO DIRECT THE REMOVAL OF THE ABOVE LISTED WORK.

MEP COMPONENT 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 161A1.10 THROUGH 161A1.26 AND ASCE 7- 16 CHAPTERS 13, 26, AND 30:

- ALL PERMANENT EQUIPMENT AND COMPONENTS.
- 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 110/120 VOLT RECEPTACLES HAVING A FLEXIBLE CABLE.
- 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.

- 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.
- 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.

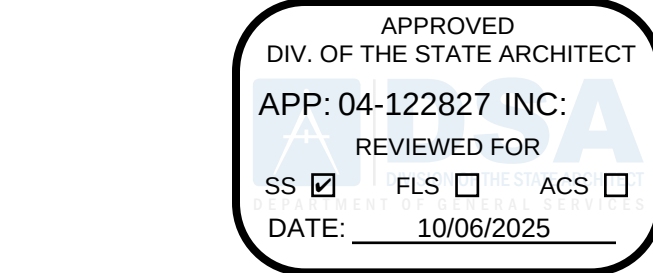
PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE

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 161A1.24, 161A1.25 AND 161A1.26.

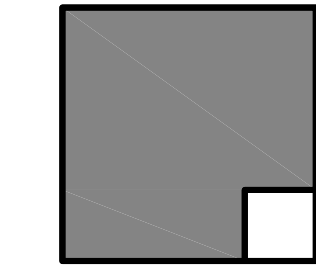
THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW. THE MEP DESIGN PROFESSIONAL ENGINEER RESPONSIBLE FOR CONTENT ON THESE SHEETS HAS VERIFIED THAT THE DESIGN METHODS IDENTIFIED BELOW ARE IN ACCORDANCE WITH DSA IR 16-13.

MECHANICAL PIPING (MP), MECHANICAL DUCTS (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 OFM, WITHIN PROJECT SUBMITTAL
- MP ☐ MD ☐ PP ☐ E ☐ OPTION 3: DESIGN BASED ON OSHPD OFM, DEFERRED SUBMITTAL



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REPLACEMENT
RANCHO BUENA VISTA HIGH SCHOOL
1601 LONGHORN DRIVE
VISTA, CA 92081
VISTA UNIFIED SCHOOL DISTRICT
1234 ARCADIA AVENUE VISTA CA 92084

REVISIONS		
MARK	DATE	DESCRIPTION
	9/30/25	ADDENDUM 01
PROJECT NO: 23-015		
MODEL FILE: 23-015 RBVHS Track and Field Replacement.pln		
PLOT DATE: 10/17/2024		
SHEET TITLE		

ELECTRICAL
LEGEND AND
NOTES

E-1.0

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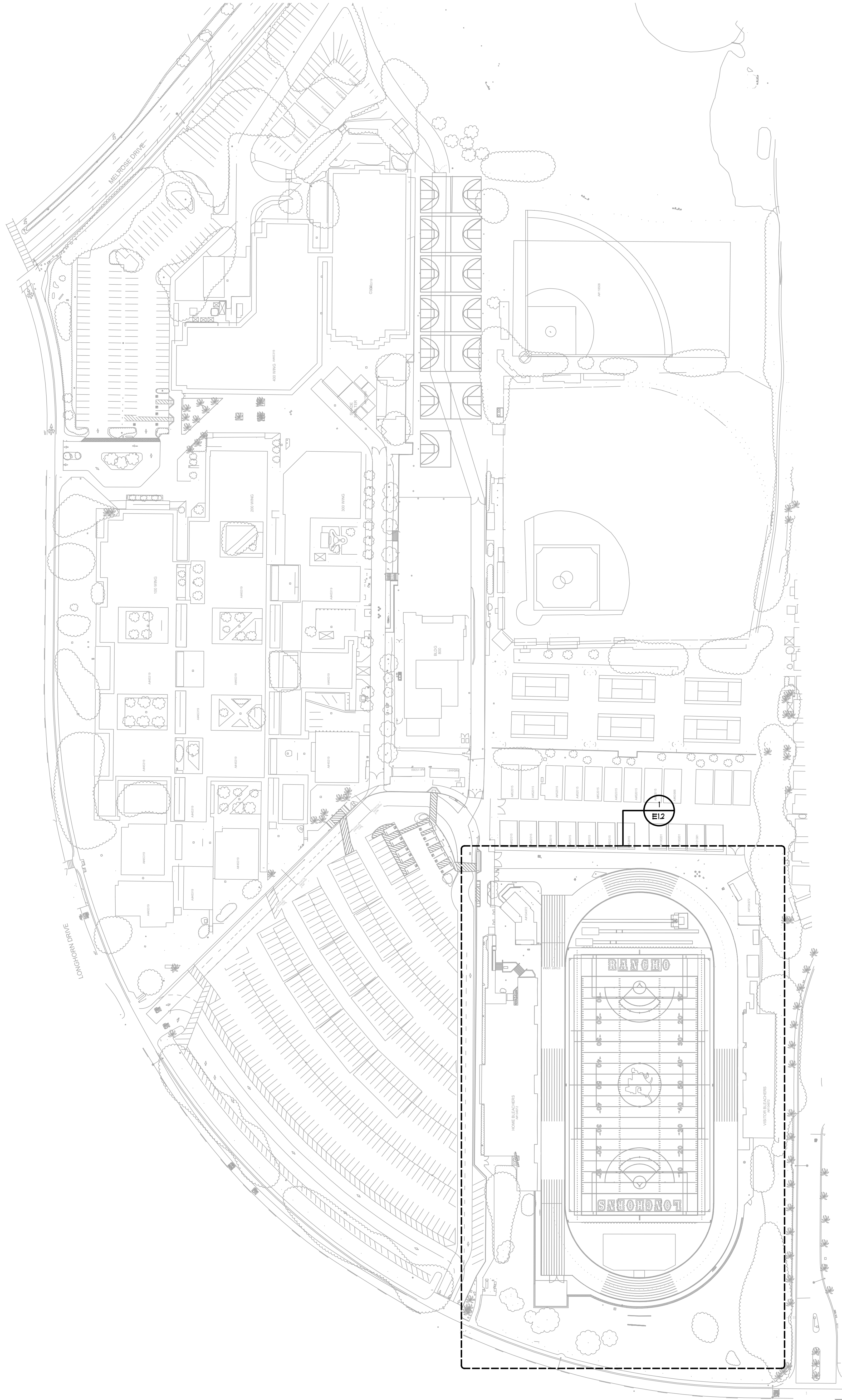
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12875 Brookprinter Place, Suite 300
Poway, CA 92084
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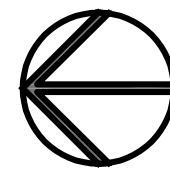
#23081

9/27/2025

1 OVERALL SITE PLAN
SCALE: 1"=70'



NORTH



REGISTERED PROFESSIONAL ENGINEER
No. E 14781
Exp. 6-30-2027
ELECTRICAL
STATE OF CALIFORNIA

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*23081 9/21/2025

E-1.1

OVERALL SITE
PLAN

SHEET TITLE

PLOT DATE:
10/17/2024

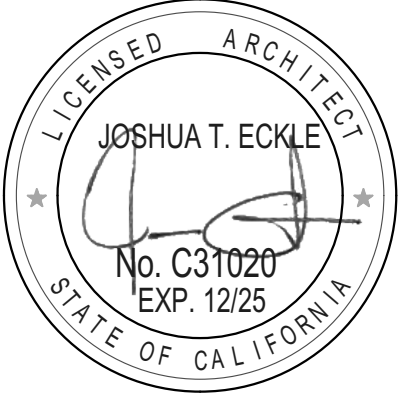
MODEL FILE:
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PROJECT NO: 23-015

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MARK	DATE	DESCRIPTION
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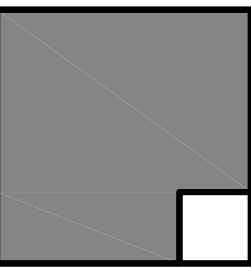
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VISTA UNIFIED SCHOOL DISTRICT
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ENGINEER OF RECORD

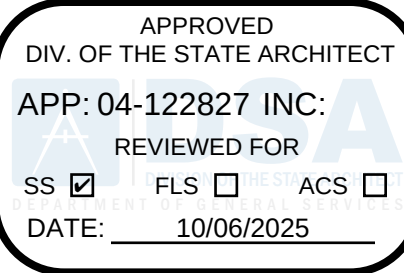


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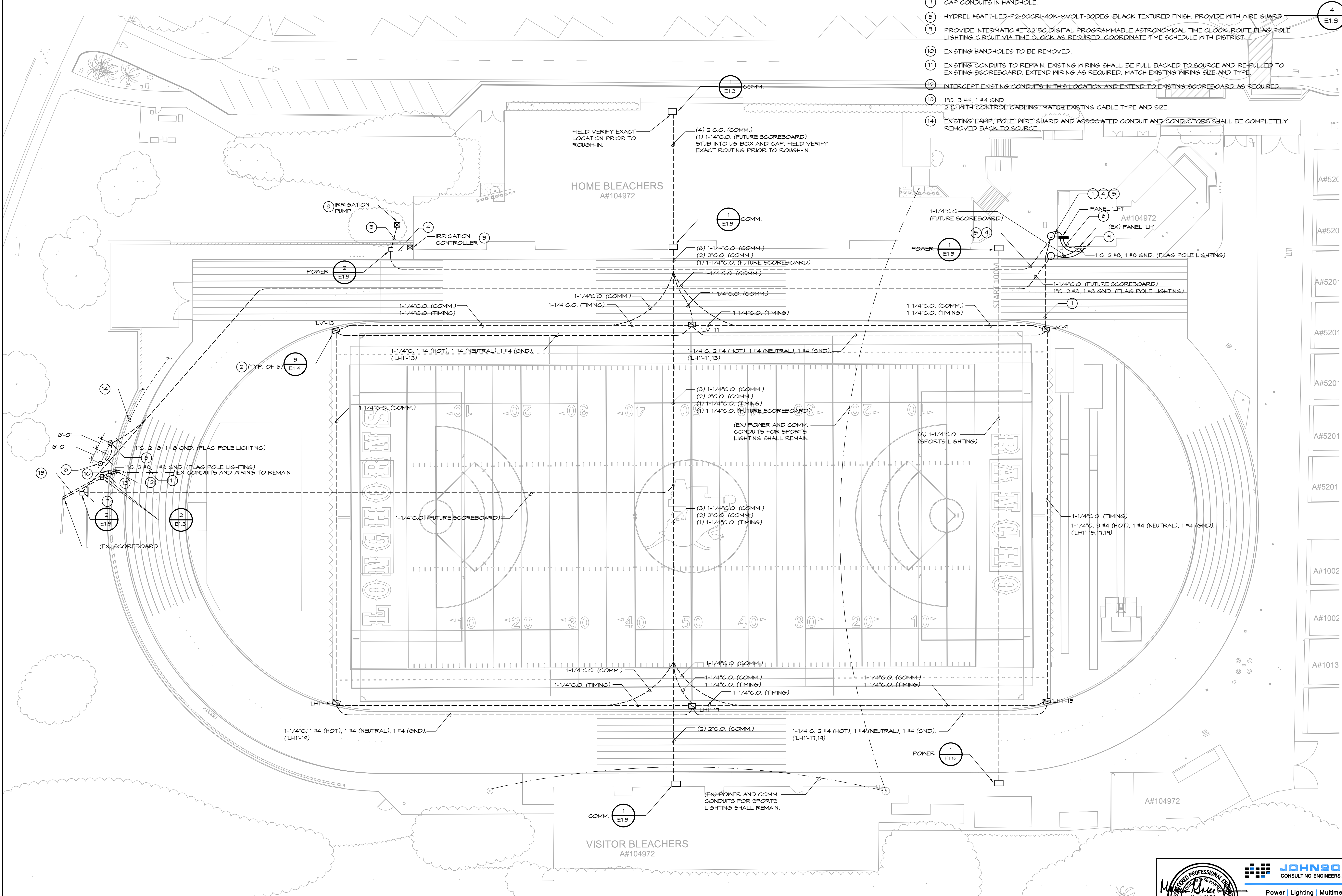


GENERAL NOTES:

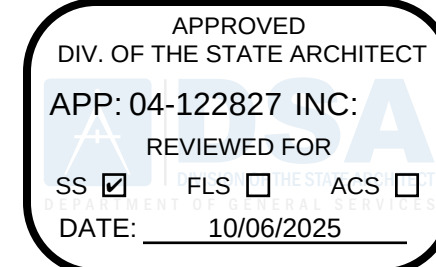
1. ALL LOW VOLTAGE, AV SOUND SYSTEM CONDUITS SHALL BE INSTALLED TO HAVE A MAXIMUM OF (2) 90 DEGREE BENDS.
2. SEE E1 SERIES SHEETS FOR TYPICAL SITE DETAILS.
3. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH PULL ROPE AND CAPPED.

KEYNOTES:

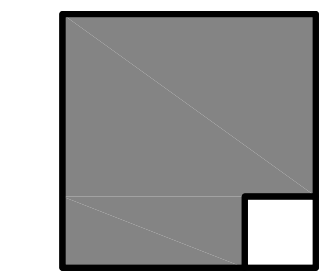
- 1 1-1/4" 3 #4 (HOT), 1 #4 (NEUTRAL), 1 #4 (GND). (LV-15,17,19)
1-1/4" 3 #4 (HOT), 1 #4 (NEUTRAL), 1 #4 (GND). (LV-9,11,13)
- 2 REFER TO FIELD & TRACK DRAWINGS FOR EXACT LOCATION.
- 3 ROUTE CONDUIT BELOW FOOTING.
- 4 1" 2 #6, 1 #6 GND. (IRRIGATION CONTROLLER, LH1-1,3,5)
- 5 1-1/2" 4 #3, 1 #3 GND. (IRRIGATION PUMP, LH1-7)
- 6 REFER TO 1/E1.5 ONE LINE DIAGRAM.
- 7 CAP CONDUITS IN HANDHOLE.
- 8 HYDREL #SAF7-LED-P2-80CRI-40K-MVOLT-30DEG. BLACK TEXTURED FINISH. PROVIDE WITH WIRE GUARD.
- 9 PROVIDE INTERMATIC #ET8215C DIGITAL PROGRAMMABLE ASTRONOMICAL TIME CLOCK. ROUTE FLAG POLE LIGHTING CIRCUIT VIA TIME CLOCK AS REQUIRED. COORDINATE TIME SCHEDULE WITH DISTRICT.
- 10 EXISTING HANDHOLES TO BE REMOVED.
- 11 EXISTING CONDUITS TO REMAIN. EXISTING WIRING SHALL BE FULL BACKED TO SOURCE AND RE-PULLED TO EXISTING SCOREBOARD. EXTEND WIRING AS REQUIRED. MATCH EXISTING WIRING SIZE AND TYPE.
- 12 INTERCEPT EXISTING CONDUITS IN THIS LOCATION AND EXTEND TO EXISTING SCOREBOARD AS REQUIRED.
- 13 1" 3 #4, 1 #4 GND.
2" 6" WITH CONTROL CABLING. MATCH EXISTING CABLE TYPE AND SIZE.
- 14 EXISTING LAMP, POLE, WIRE GUARD AND ASSOCIATED CONDUIT AND CONDUCTORS SHALL BE COMPLETELY REMOVED BACK TO SOURCE.



1 ENLARGED SITE PLAN
SCALE: 1"=20'-0"

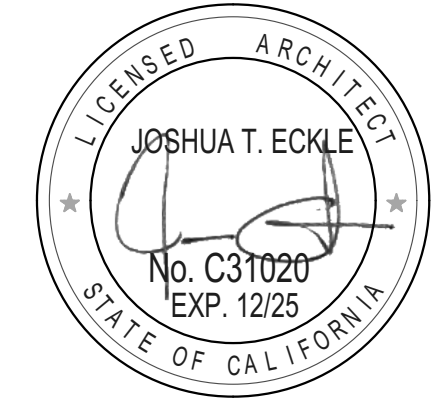


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RANCHO BUENA VISTA HIGH SCHOOL
1601 LONGHORN DRIVE
VISTA, CA 92081
VISTA UNIFIED SCHOOL DISTRICT
1234 ARCADIA AVENUE VISTA CA 92084

REVISIONS

MARK	DATE	DESCRIPTION
ADD	9/30/25	ADDENDUM 01

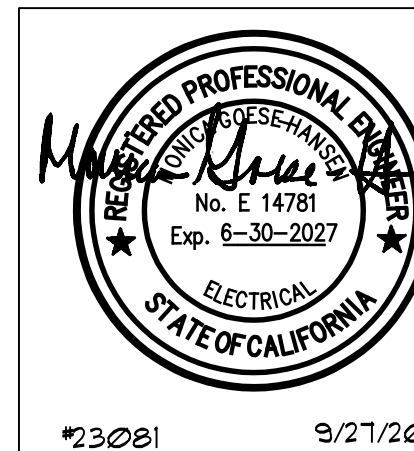
PROJECT NO: 23-015

MODEL FILE:
23-015 RBVHS Track and Field Replacement.pln

PLOT DATE:
10/17/2024

SHEET TITLE

ENLARGED SITE
PLAN

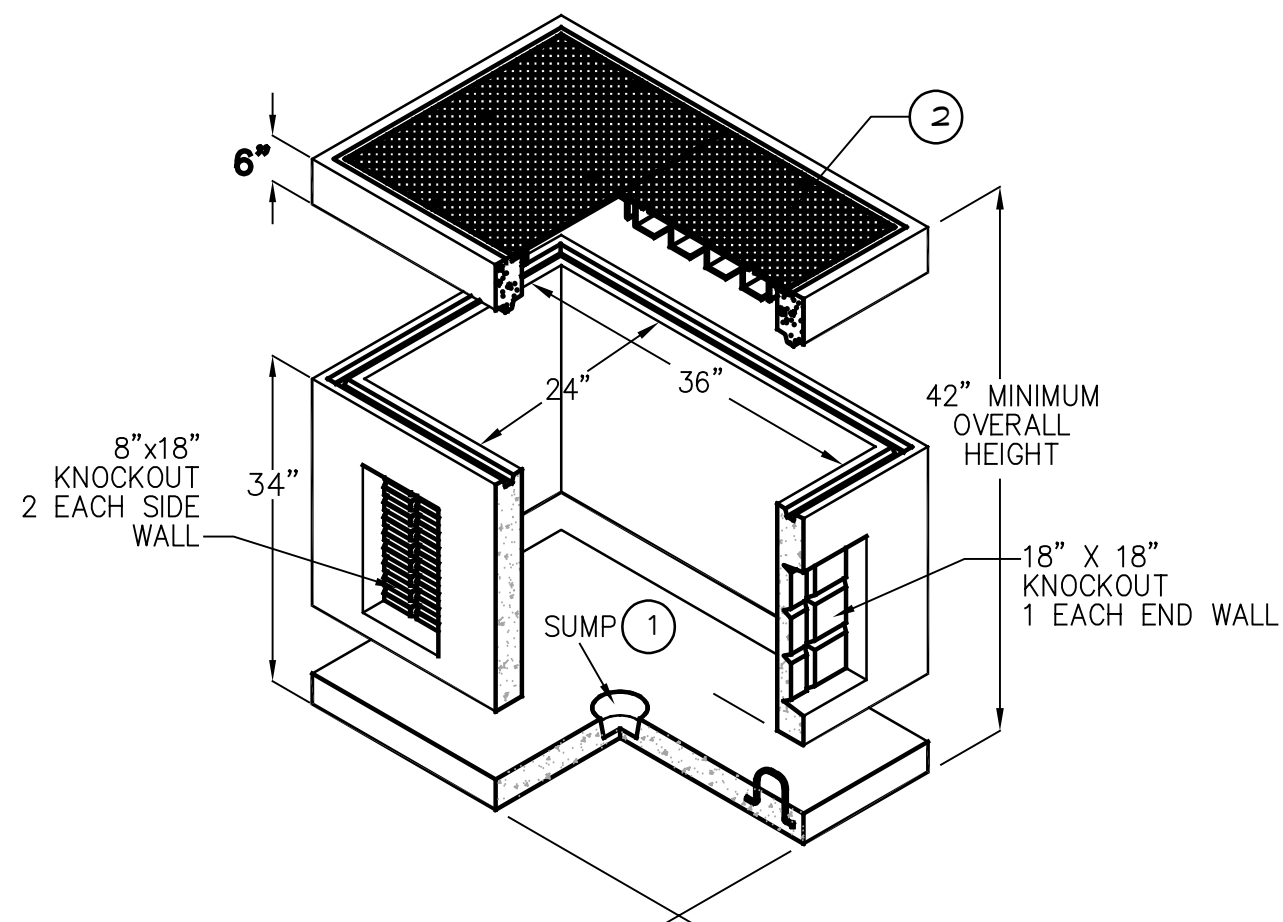


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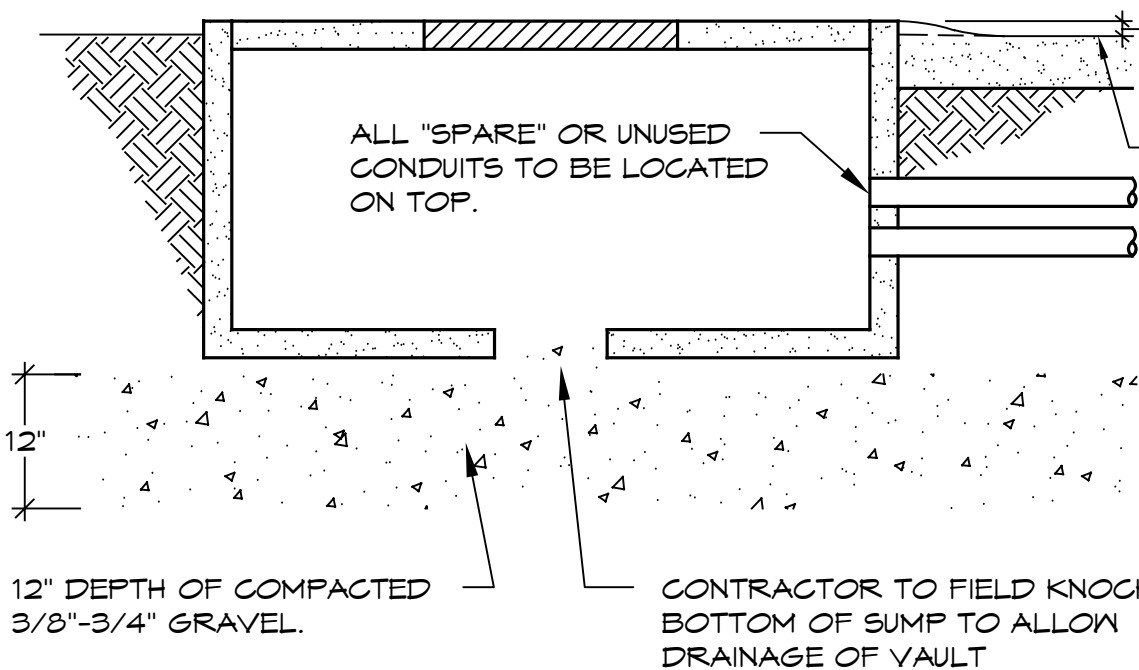
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E-1.2

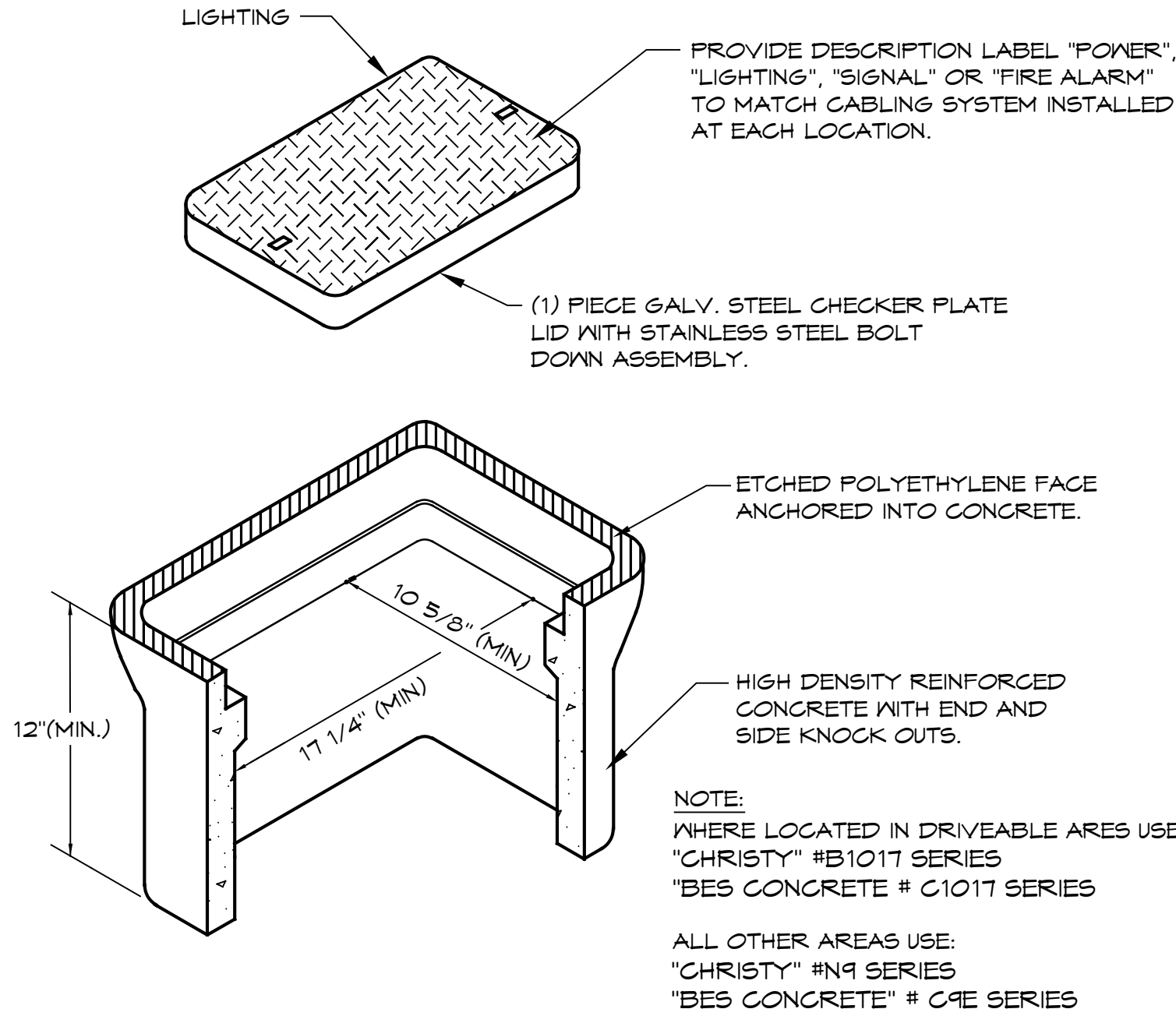


- "JENSEN PRECAST" - 2436 SERIES, OR EQUAL
- KEY NOTES:**
- 12"x12" SUMP (FIELD KNOCKOUT BOTTOM) AND FILL WITH GRAVEL TO DRAIN.
 - H-20 RATED GALVANIZED STEEL COVER.

GENERAL INSTALLATION REQUIREMENTS:



- HANDHOLES SHALL BE PROVIDED WITH A MINIMUM OF (4) GALVANIZED PULLING PLATES IN BOTTOM OF PULLBOX.
- PULLBOXES SHALL BE PROVIDED WITH CAST IN PLACE VERTICAL CABLE RACKS. ALL CABLES SHALL BE NEATLY BUNDLED, ORGANIZED AND SUPPORTED BY CABLE RACKS.
- WHERE ADDITIONAL CONDUIT ENTRIES ARE REQUIRED BEYOND QUANTITY OF TERMINATORS SHOWN, CONTRACTOR SHALL FIELD CORE DRILL AS REQUIRED. WHERE 4" TERMINATORS ARE PROVIDED CONTRACTOR SHALL PROVIDE CONDUIT REDUCERS TO MATCH SITE CONDUIT SIZE REQUIREMENTS.
- FOR ALTERNATE STYLE PULLBOXES CONTRACTOR SHALL FIELD CORE DRILL ALL CONDUIT ENTRIES 2" DIA AND SMALLER.



- NOTE:
- WHERE LOCATED IN DRIVEABLE AREAS USE:
"CHRISTY" #B1017 SERIES
"BES CONCRETE" # C1017 SERIES
- ALL OTHER AREAS USE:
"CHRISTY" #N9 SERIES
"BES CONCRETE" # C9E SERIES

UNDERGROUND PULLBOX STYLE 'C'

NO SCALE

DET-11

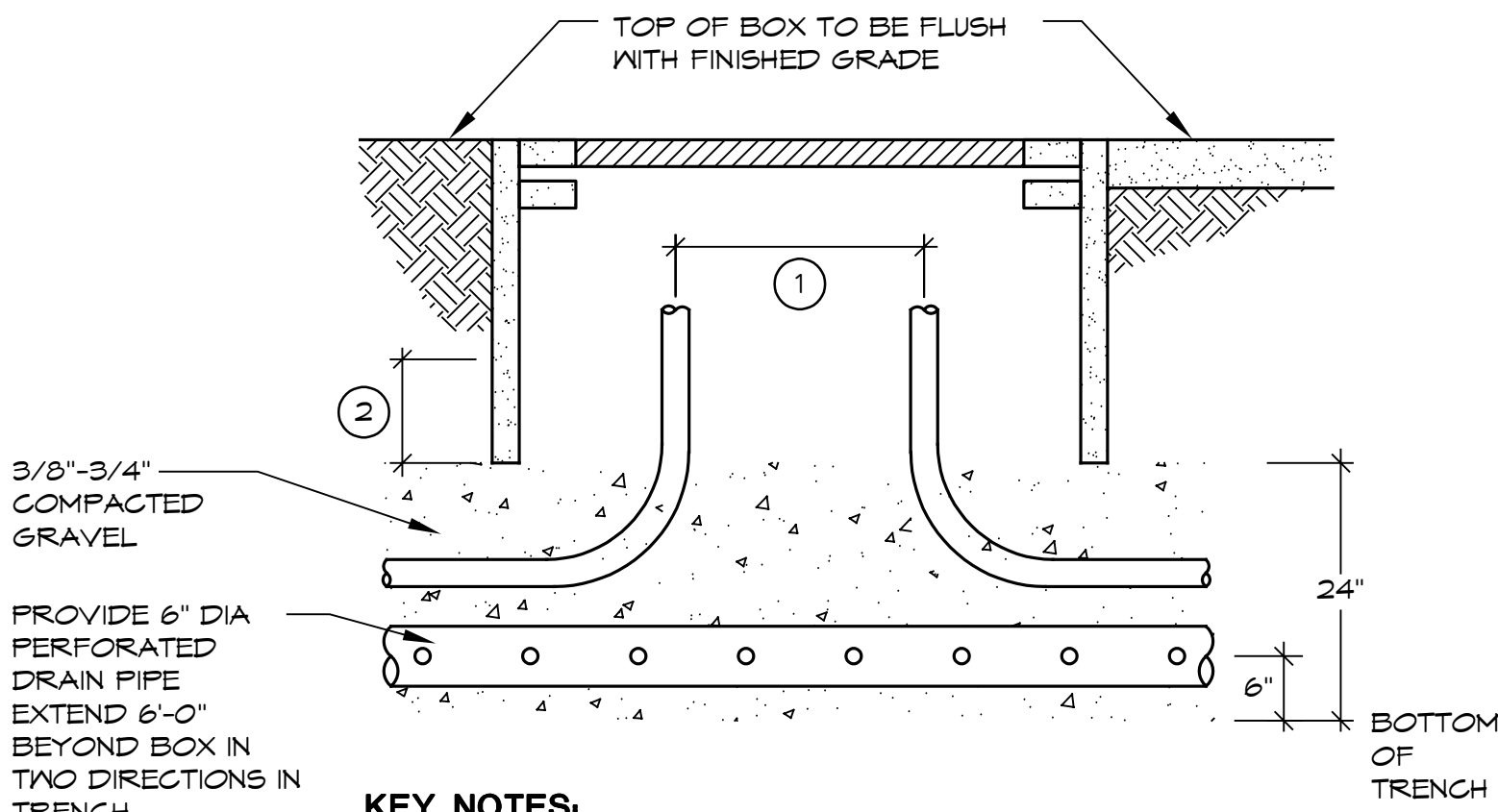
1
E1.3

UNDERGROUND PULLBOX STYLE 'A'

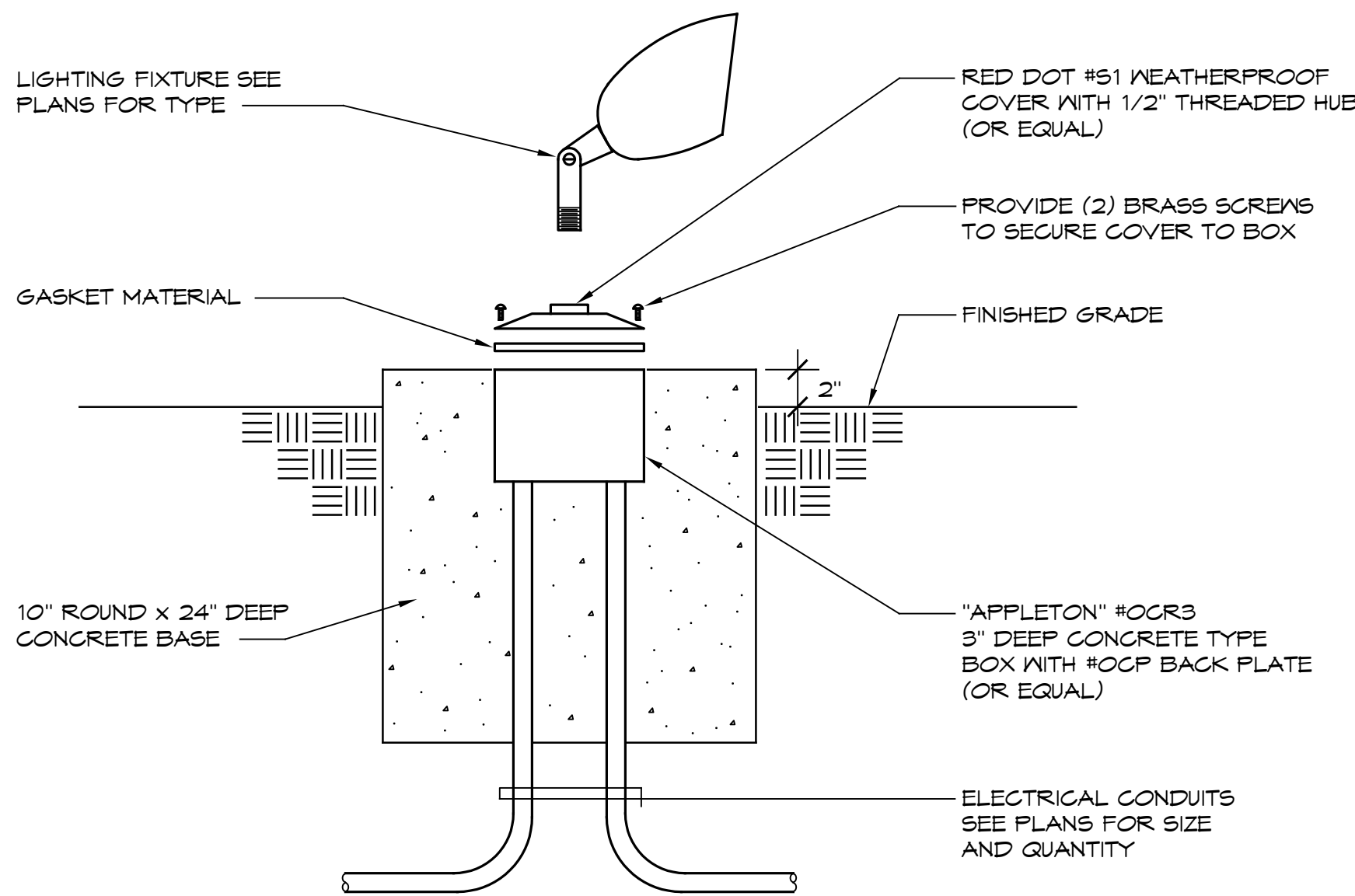
NO SCALE

DET-11

2
E1.3



- KEY NOTES:**
- WHERE CONDUITS SERVE INCOMING AND OUTGOING CIRCUITS KEEP RISERS SEPARATED INSIDE PULLBOX TO ALLOW FOR SLACK CONDUCTORS.
 - TOPS OF CONDUITS MUST NOT EXTEND INTO PULLBOX MORE THAN 1/3 OF THE TOTAL AVAILABLE INSIDE BOX HEIGHT, IN ORDER TO ALLOW ADEQUATE SPACE FOR CABLE SLACK.



UNDERGROUND PULLBOX

STYLE 'A' OR 'B' TYP. INSTALLATION

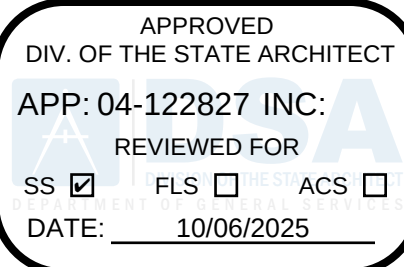
NO SCALE

3
E1.3

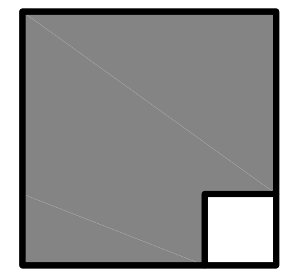
LANDSCAPE LIGHT MOUNTING DETAIL

NO SCALE

4
E1.3

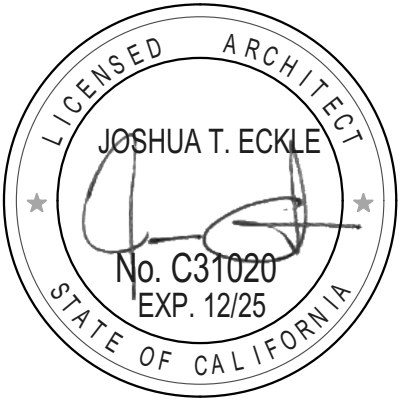


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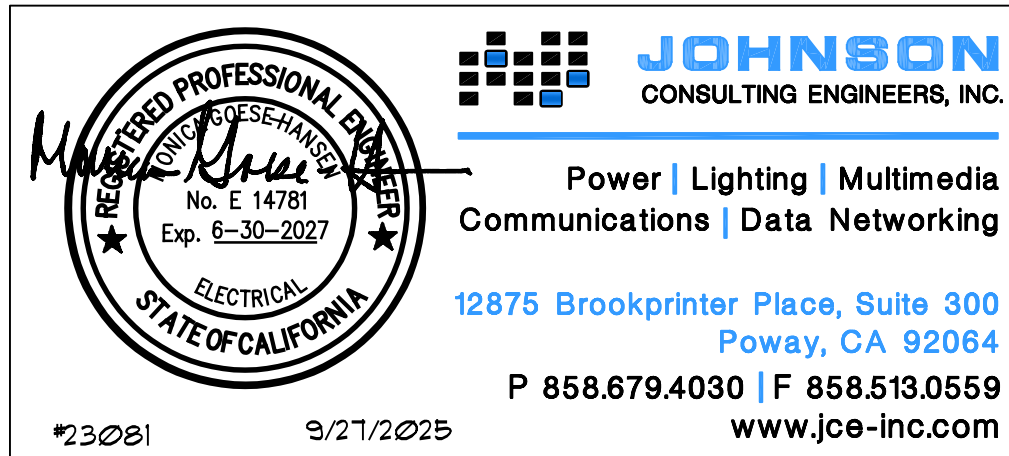
PROJECT NO: 23-015

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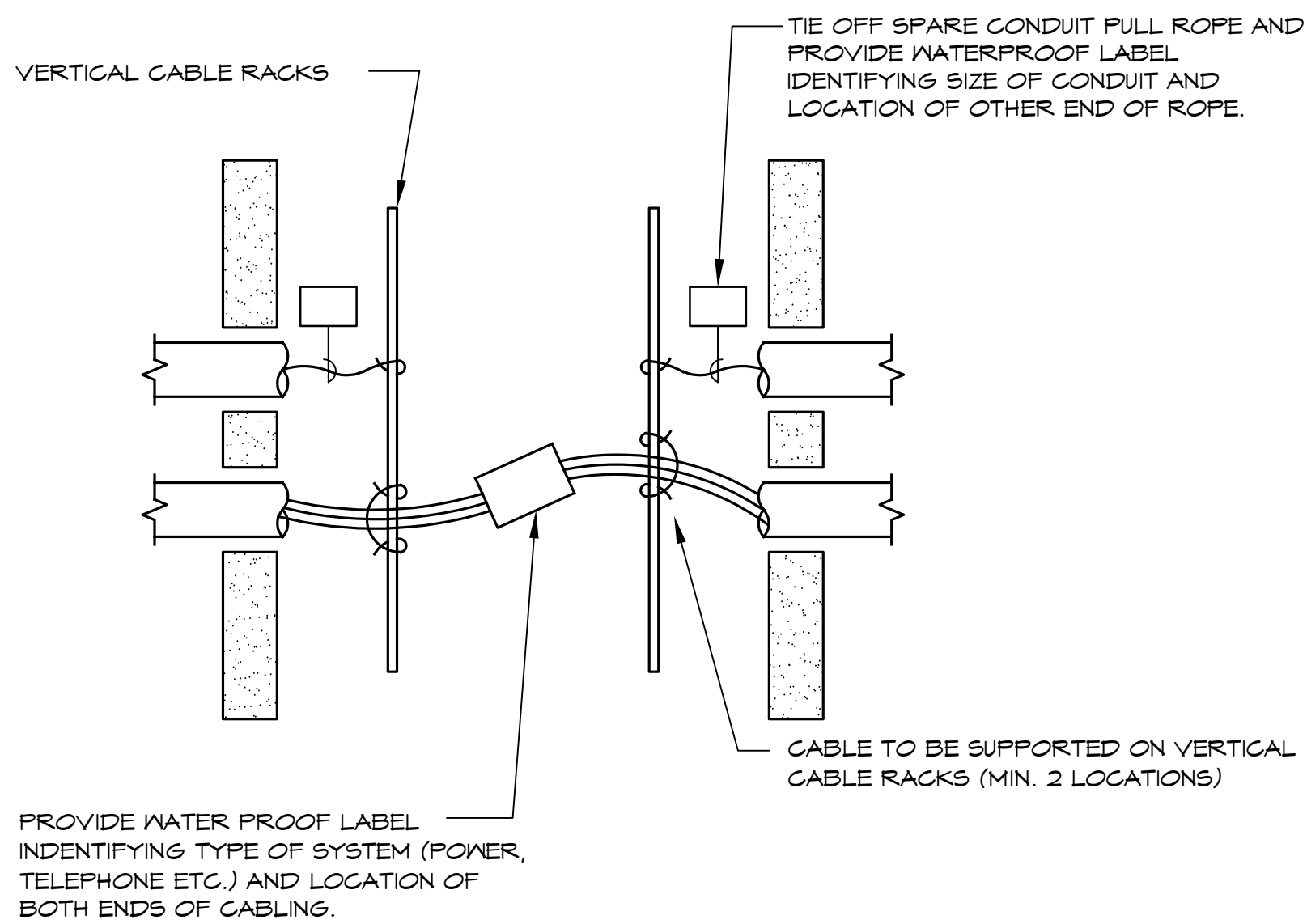
SHEET TITLE

ELECTRICAL SITE
DETAILS



E-1.3

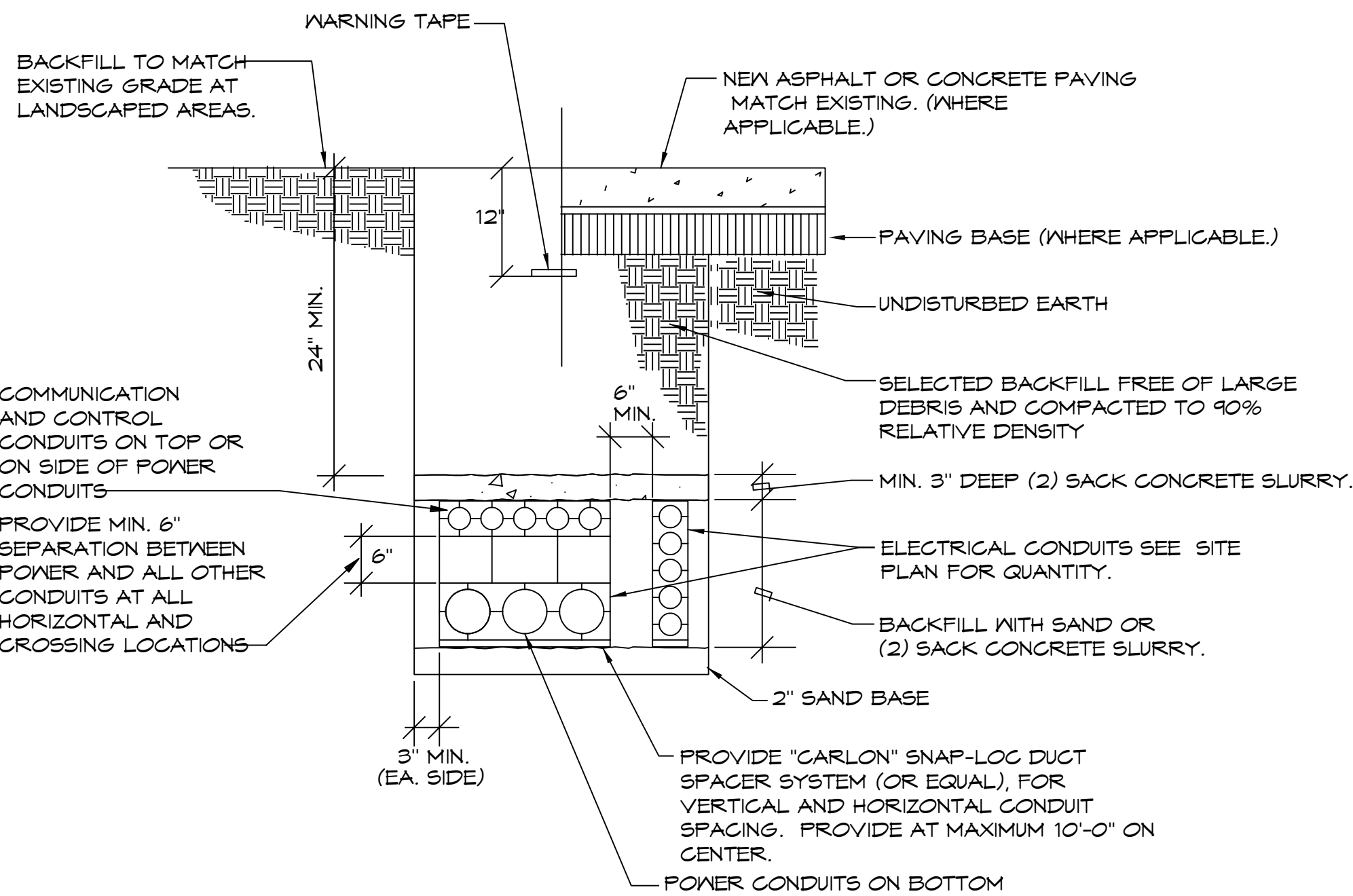
ADD



TYPICAL UNDERGROUND PULLBOX LABELING/SUPPORT DETAIL

NO SCALE

1
E1.4

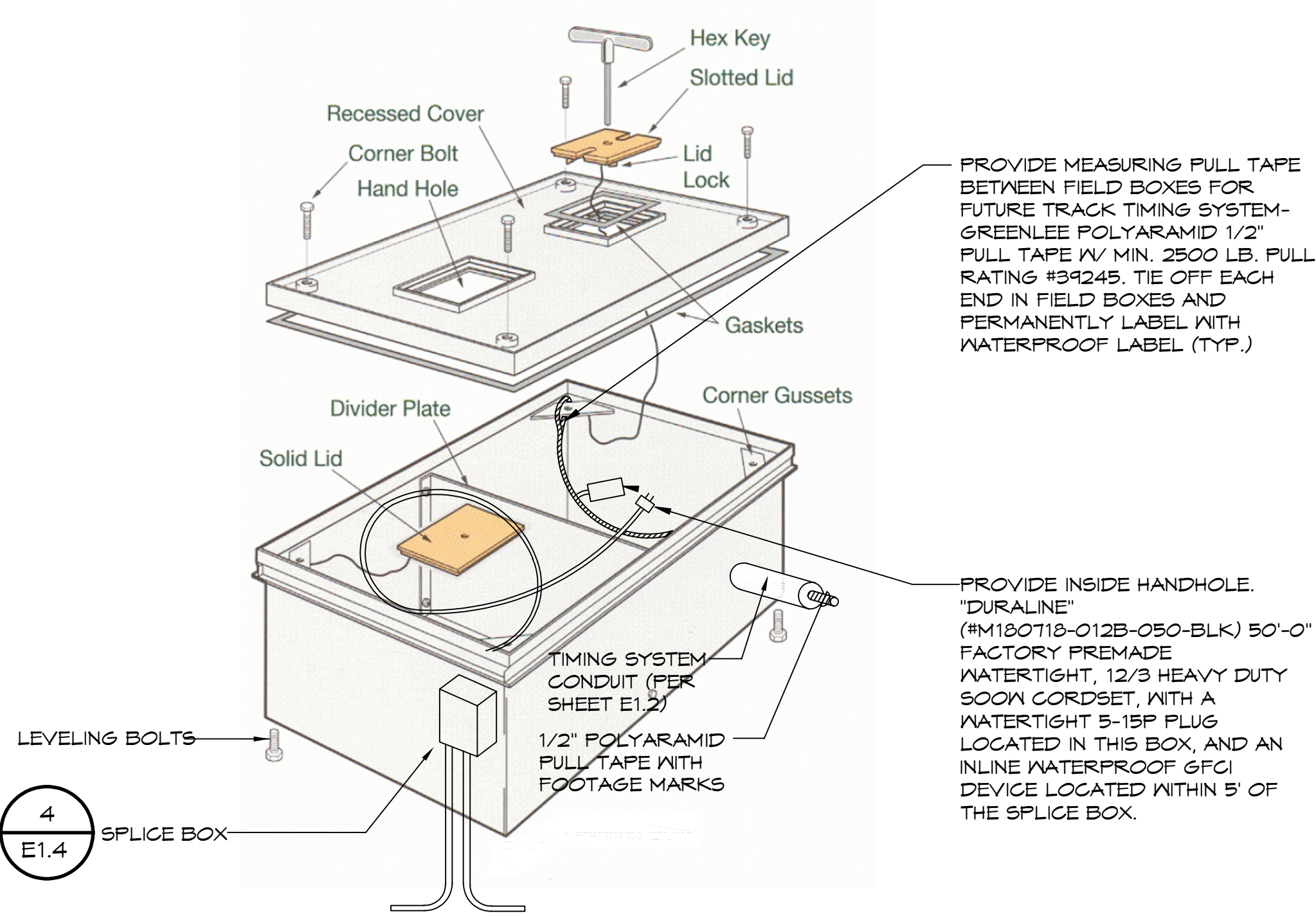


TYPICAL TRENCH DETAIL

NO SCALE

2
E1.4

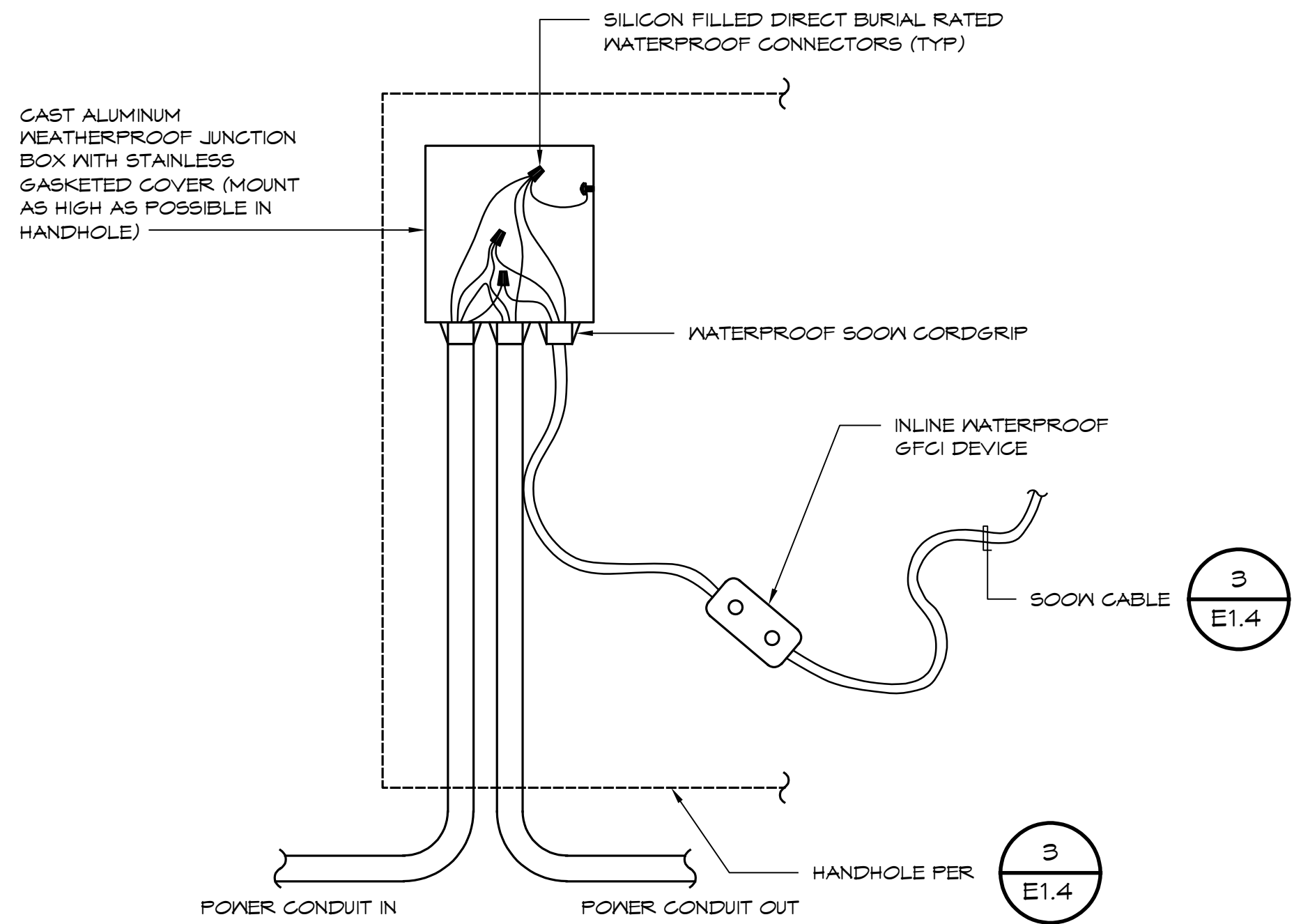
NOTE:
FIELD LEVEL COMMUNICATIONS BOX FURNISHED AND
INSTALLED BY THE PLAYING FIELD CONTRACTOR.



POWER/COMM HANDHOLE IN ARTIFICIAL GRASS PLAY FIELD AREA

NO SCALE

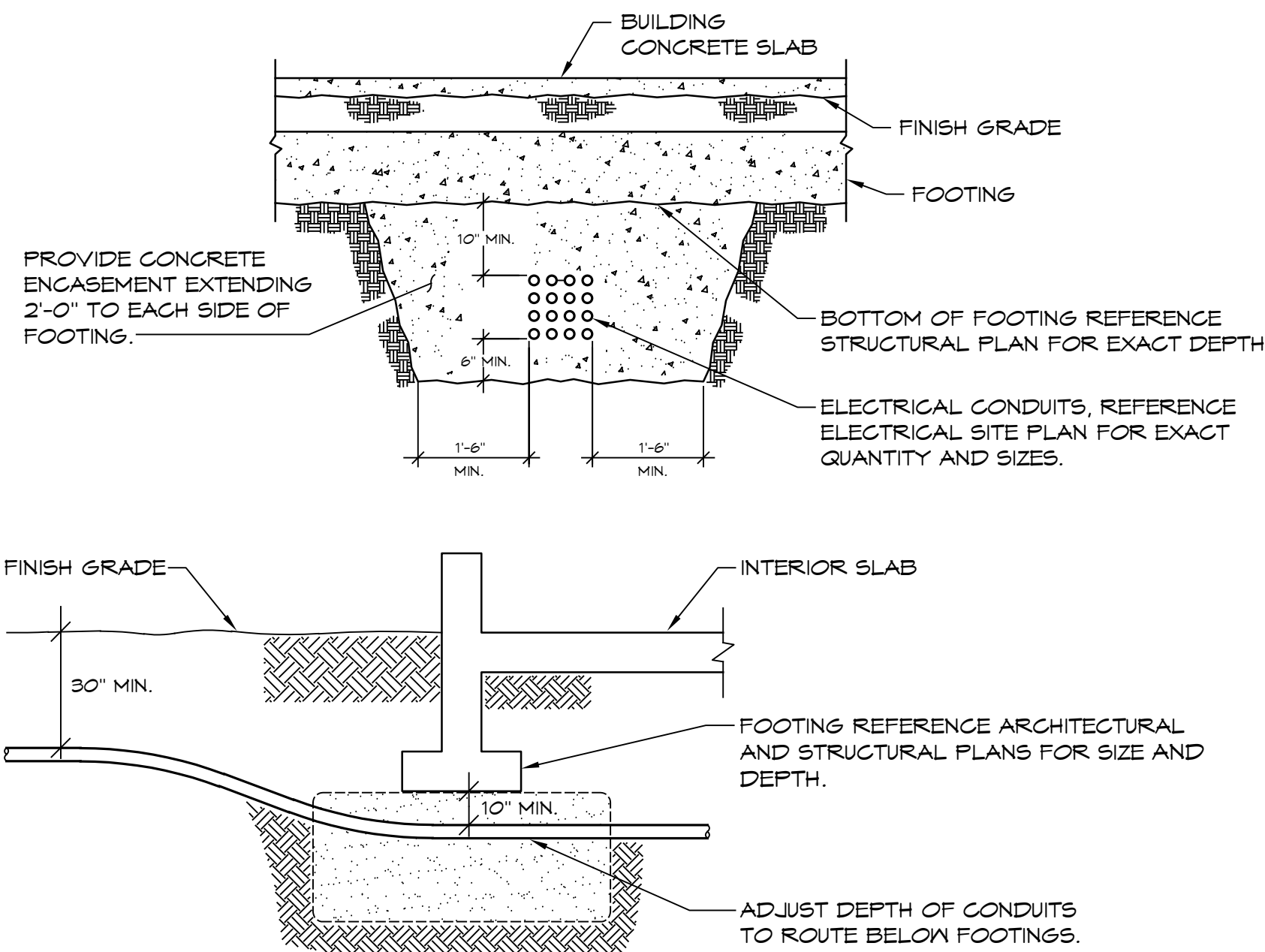
3
E1.4



HANDHOLE POWER CONNECTION

NO SCALE

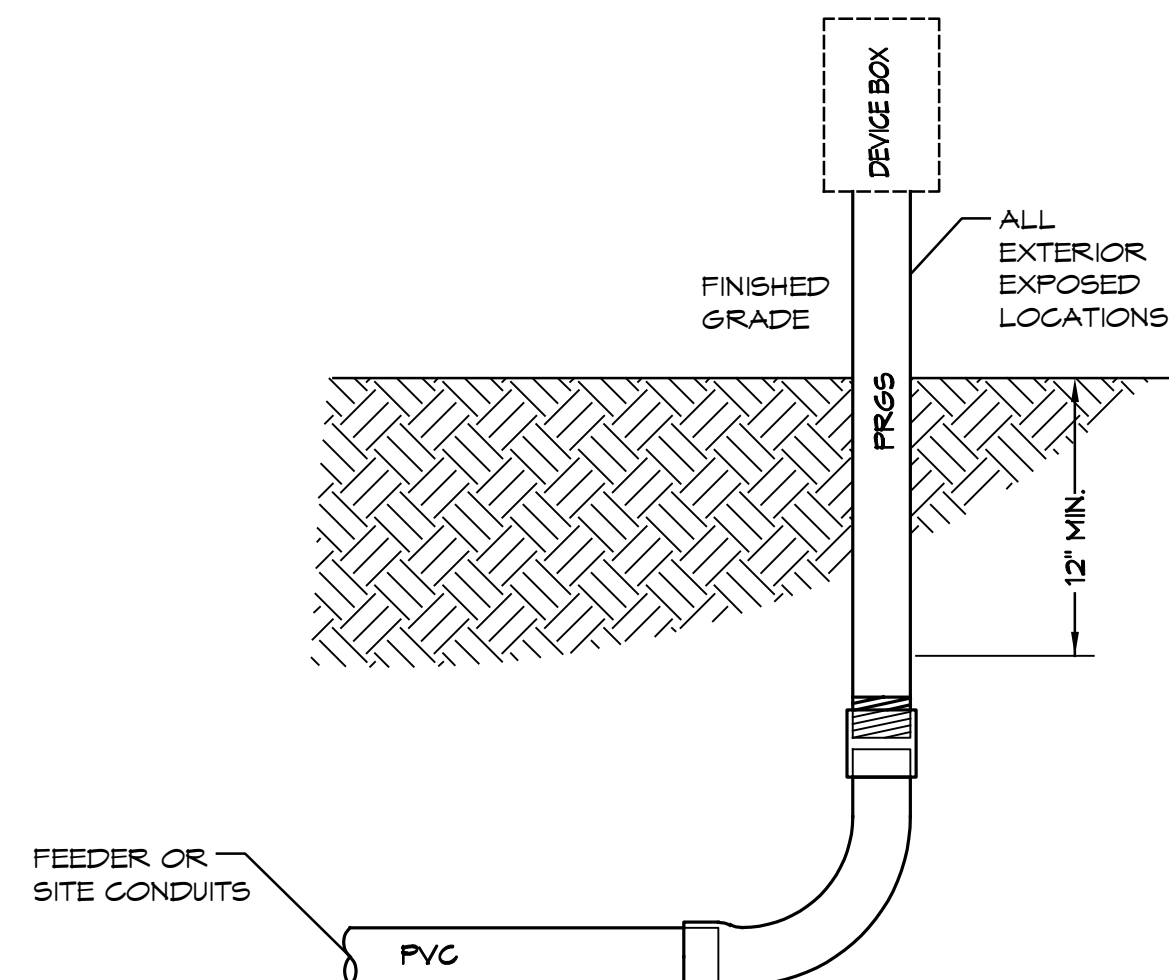
4
E1.4



UNDERGROUND CONDUIT - INSTALLATION AT FOOTING

NO SCALE

5
E1.4

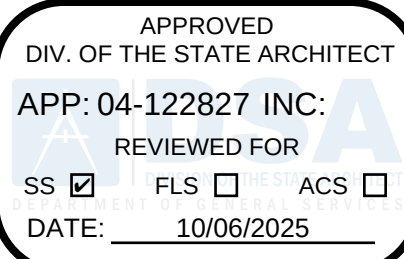


PVC = SCHEDULE 40 P.V.C. CONDUIT
PRGS = PVC COATED RIGID STEEL CONDUIT
EMT = ELECTRICAL METALLIC CONDUIT

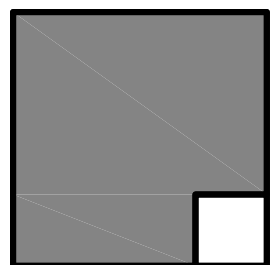
TYPICAL CONDUIT DETAIL

NO SCALE

6
E1.4

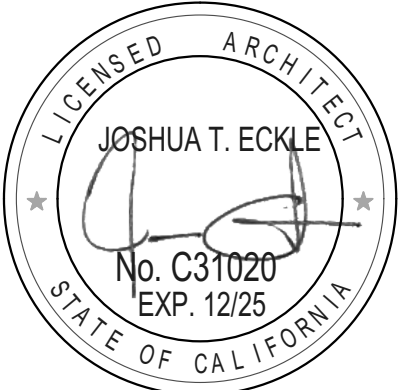


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10/17/2024

SHEET TITLE

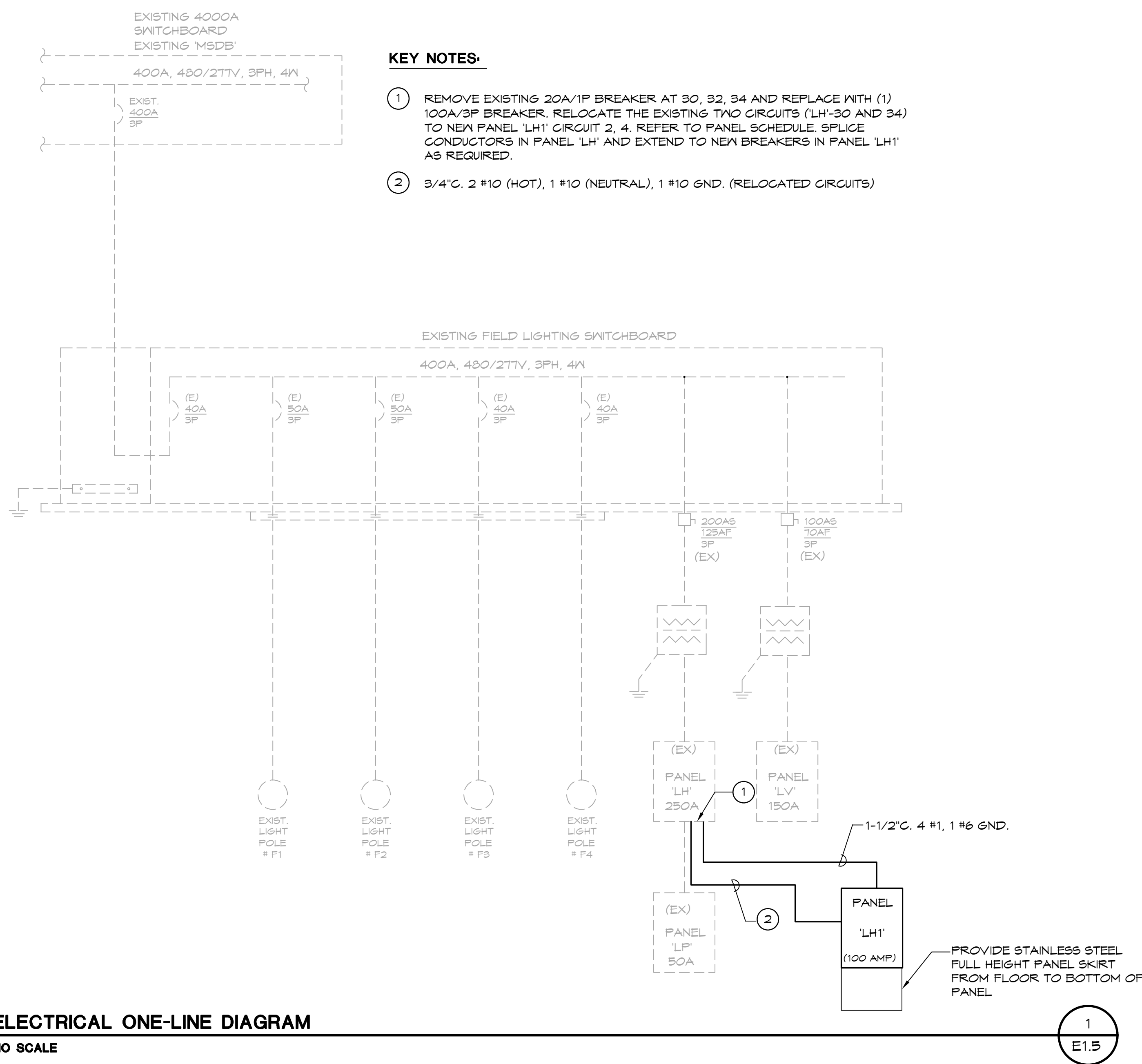
SITE ELECTRICAL
DETAILS

Power | Lighting | Multimedia
Communications | Data Networking

12875 Brookprinter Place, Suite 300
Poway, CA 92064
P 858.679.4030 | F 858.513.0559
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E-1.4

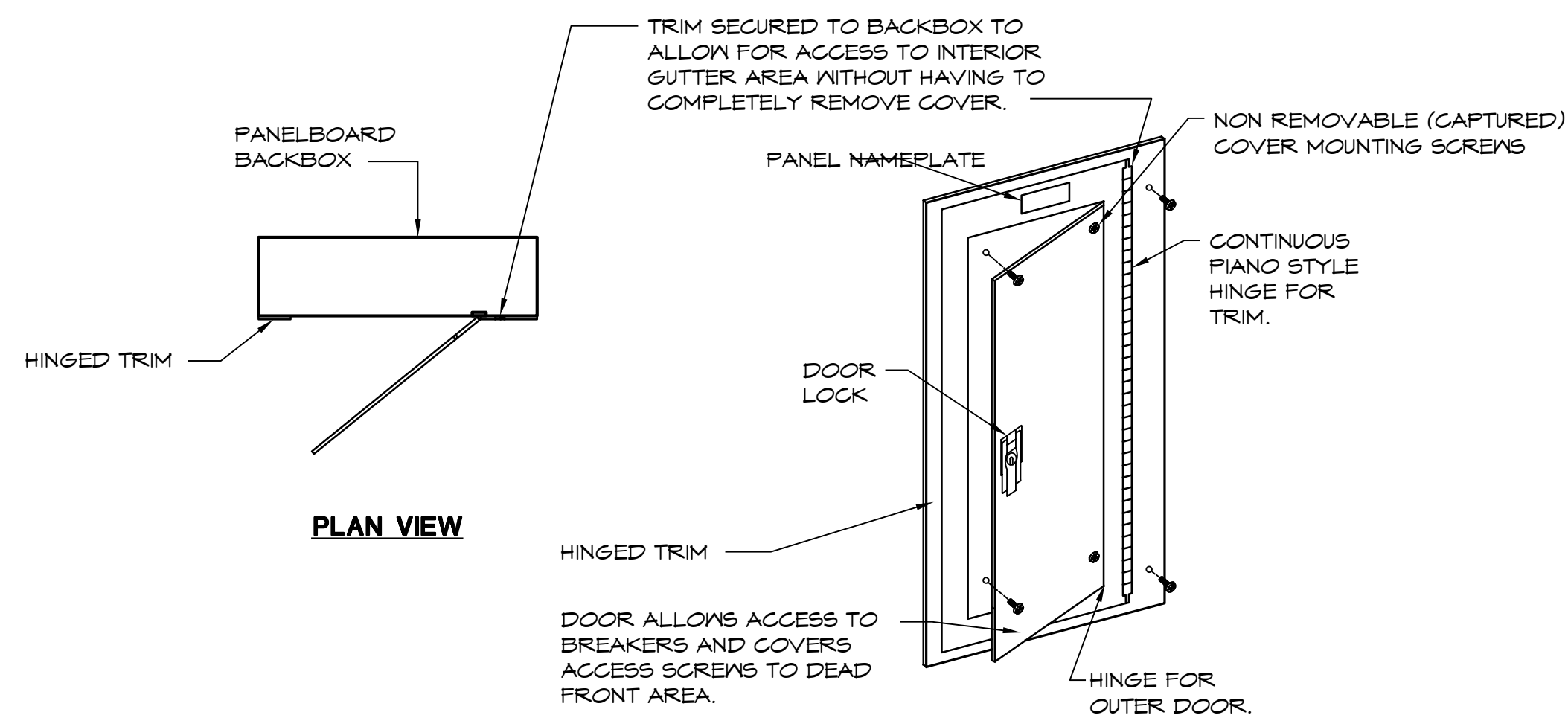




120/208 ▼	120/208 3PH, 4WIRE		100 AMP						Main Breaker Lup	X	ENCLOSURE TYPE		ENCLOSURE NOTE			
	200% Neutral Bus								Enclosure	Recessed Surface	X	NEMA TYPE 1 MIN. 22k AIC				
LH1	(INTEGRAL)TVSS Protection											NEMA TYPE 3R				
	(REMOTE)TVSS Protection											NEMA TYPE 4X				
	Service Entrance Rating															
	Load Side Feed thru Lugs															
GENERAL DISTRIBUTION BREAKER REQUIREMENTS:			PROVIDE LOCK ON BREAKER DEVICES FOR ALL EMERGENCY LIGHTING, WATER HEATERS MOTORS, AND FIRE ALARM EQUIPMENT SERVED FROM THIS PANEL													
Circuit	NHL	CIRCUIT DESCRIPTION	AMP	POLE	NO.	PHASE A	PHASE B	PHASE C	NO.	AMP	POLE	CIRCUIT DESCRIPTION	LCL	NHL		
		IRRIGATION PUMP	40	3	1	3360			2	20	1	(EX) BLEACHER RECEPT				
		"			3	400			4	20	1	(EX) TRACK RECEPTACLES				
		"			5				6	20	1	FLAG POLE LIGHTING				
		IRRIGATION CONTROLLER	20	1	7	800			8	20	1	SPARE				
		FIELD BOX	20	1	9				10	20	1	SPARE				
		FIELD BOX	20	1	11				12	20	1	SPARE				
		FIELD BOX	20	1	13	400			14	20	1	SPARE				
		FIELD BOX	20	1	15				16	20	1	SPARE				
		FIELD BOX	20	1	17				18	20	1	SPARE				
		FIELD BOX	20	1	19	400			20	20	1	SPARE				
		SPARE	20	1	21				22	20	1	SPARE				
		SPARE	20	1	23				24	20	1	SPARE				
		SPARE	20	1	25				26	20	1	SPARE				
		SPARE	20	1	27				28	20	1	SPARE				
		SPARE	20	1	29				30	20	1	SPARE				
		SPARE	20	1	31				32	20	1	SPARE				
		SPARE	20	1	33				34	20	1	SPARE				
		SPARE	20	1	35				36	20	1	SPARE				
			20	1	37				38	20	1					
			20	1	39				40	20	1					
			20	1	41				42	20	1					
SPECIAL PANEL																
NOTE		NOTE #1														
		NOTE #2														
NHL= Non Harmonic Load		TOTAL LOAD PER PHASE				5360	4560	4360								
LCL= Long Continuous Load		25% LONG CONTINUOUS LOADS				0	0	0								
		SUB PANEL									HIGH PHASE	5360	/ 0.9pf = VA @	120V	49.6 AMPS	
		SUB PANEL									ALL PHASE	14280	/ 0.9pf = VA @	208V/3PH	44.1 AMPS	
Max. Neut. Load											DEMAND PER					AMPS
76 AMPS		TOTAL CONNECTED LOAD				5360	4560	4360	CEC 220-96							

M:\Panel Schedule\2023\23082 RBV HS Track and Field\LH1 - 3PH - Panel.xls

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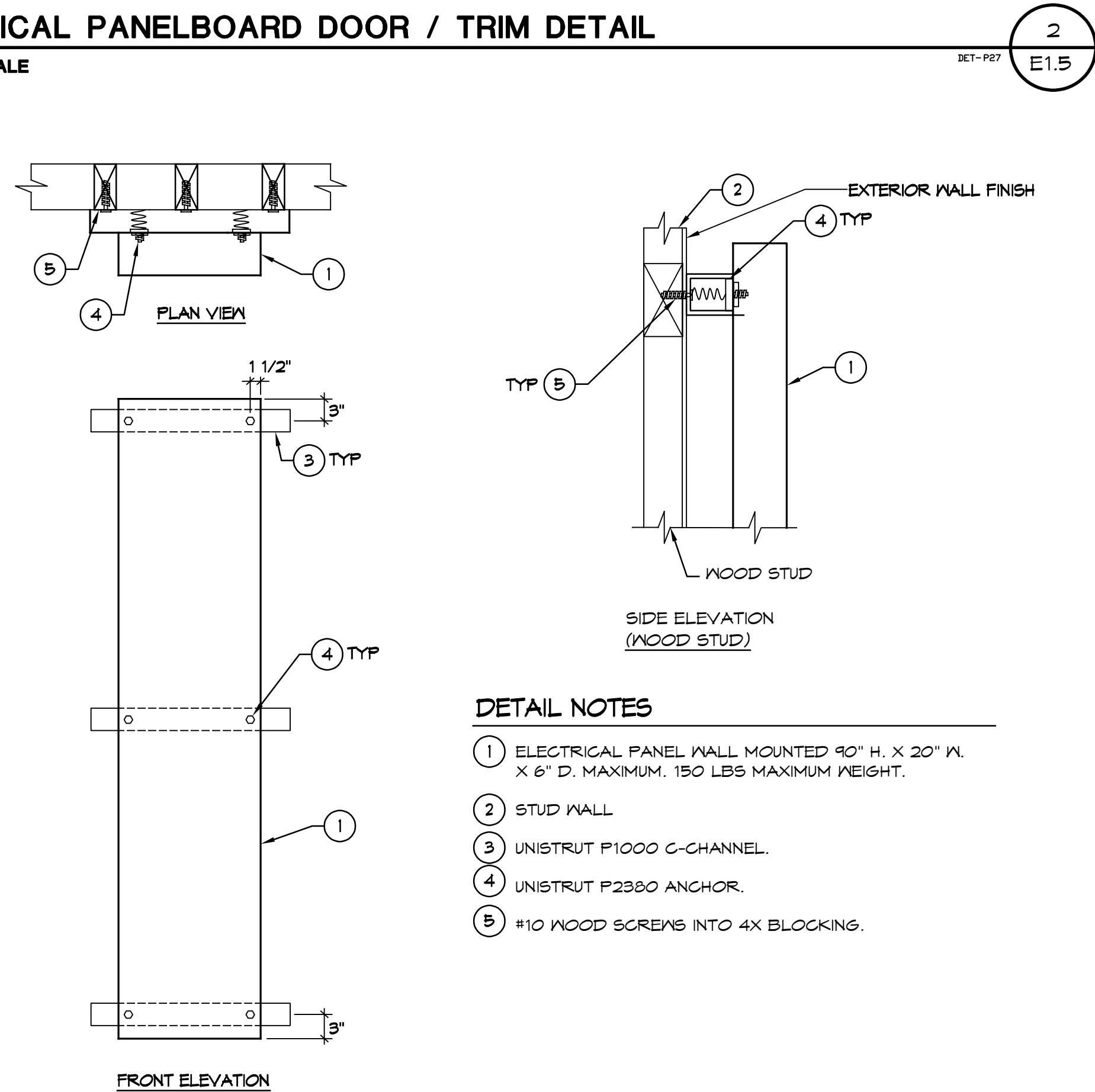


DETAIL GENERAL NOTES

1. PROVIDE FOR ALL PANELBOARDS FOR THIS PROJECT - SURFACE, RECESSED NEMA 1, OR NEMA 3R CONFIGURATION.
2. SEE REFERENCE ONE LINE DIAGRAM FOR ALL PANELBOARD AIC RATINGS.

TYPICAL PANELBOARD DOOR / TRIM DETAIL

NO SCALE

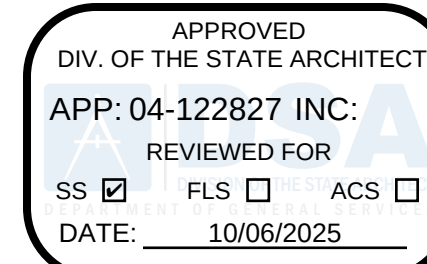


DETAIL NOTES

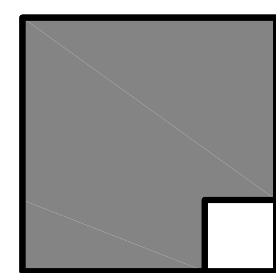
- ① ELECTRICAL PANEL WALL MOUNTED 90" H. X 20" W X 6" D. MAXIMUM. 150 LBS MAXIMUM HEIGHT.
- ② STUD WALL.
- ③ UNISTRUT P1000 C-CHANNEL.
- ④ UNISTRUT P2380 ANCHOR.
- ⑤ #10 WOOD SCREWS INTO 4X BLOCKING.

SURFACE WALL MOUNTED ELECTRICAL PANEL DETAIL

NO SCALE

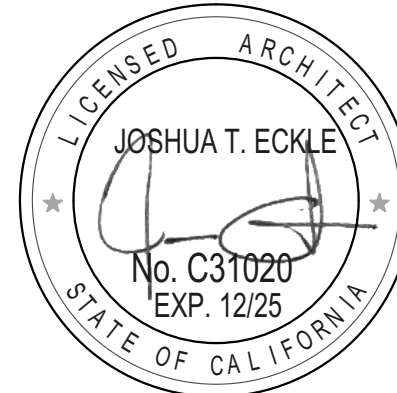


ALPHASTUDIO DESIGN GROUP



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ARCHITECT OF RECORD



ENGINEER OF RECORD

**TRACK AND FIELD
REPLACEMENT**
RANCHO BUENA VISTA HIGH SCHOOL
1601 LONGHORN DRIVE
VISTA, CA 92081

VISTA UNIFIED SCHOOL DISTRICT
1234 ARCADIA AVENUE VISTA CA 92084

REVISIONS		
MARK	DATE	DESCRIPTION
01 ADD	9/30/25	ADDENDUM 01

PROJECT NO: 23-015

MODEL FILE:
23-015 RBVHS Track and Field Replacement.plr

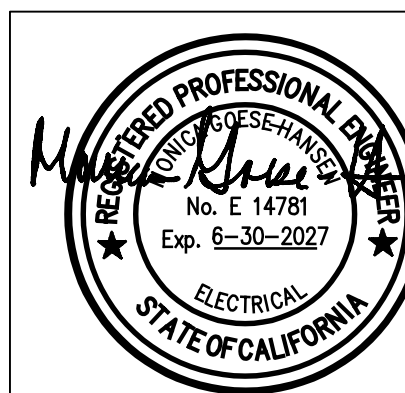
PLOT DATE

10/17/2024

SHEET TITLE

ONE LINE DIAGRAM AND PANEL SCHEDULE

E-1.5



JOHNSON
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2308

9/27/2025

SECTION 26 0100
ELECTRICAL GENERAL PROVISIONS

PART 1– GENERAL

SUMMARY

- 1.1 This Division of the specification outlines the provisions of the contract work to be performed under this Division.
- 1.2 This Section applies to and forms a part of each section of specifications in Division 26 and all work performed under Division 26 and 28.
- 1.3 In addition, work in this Division is governed by the provisions of the bidding requirements, contract forms, general conditions and all sections under general requirements.
- 1.4 These specifications contain statements which may be more definitive or more restrictive than those contained in the General Conditions. Where these statements occur, they shall take precedence over the General Conditions.
- 1.5 Where the words 'provide' or 'provision' are used, it shall be definitely interpreted as 'furnishing and installing complete in operating condition'. Where the words 'as indicated' or 'as shown' are used, it shall mean as shown on contract drawings.
- 1.6 Where items are specified in the singular, this Division shall provide the quantity as shown on drawings plus any spares or extras mentioned on drawings or specifications. All specified and supplied equipment shall be new.

CONTRACTOR QUALIFICATIONS

- 1.7 The Contractor shall have a current California C-10 Electrical Contractor's license and all individuals working on this project shall have passed the Department of Industrial Relations Division of apprenticeship Standards – “Electrician Certification Program.”

CODES, PERMITS AND FEES

- 1.8 Comply with all applicable laws, ordinances, rules, regulations, codes, or rulings of governmental units having jurisdiction as well as standards of CEC and serving utility requirements.
- 1.9 Obtain permits, fees, inspections, meter and the like, associated with work in each section of this Division.
- 1.10 Installation procedures, methods and conditions shall comply with the latest requirements of the Federal Occupational Safety and Health Act (OSHA).

EXAMINATION OF PREMISES

- 1.11 Examine the construction drawings and premises prior to bidding. No allowances will be made for not being knowledgeable of existing conditions.

STANDARD`S

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- 1.12 The following standard publications of the latest editions enforced, and supplements thereto shall form a part of these specifications. All electrical work must, as a minimum, be in accordance with these standards.

- 1.12.1 2022 California Electrical Code (CEC), Part 3 Title 24 CCR.
- 1.12.2 National Fire Protection Association.
- 1.12.3 Underwriters' Laboratories, Inc. (UL).
- 1.12.4 Certified Ballast Manufacturers' Association (CBM).
- 1.12.5 National Electrical Manufacturers' Association (NEMA).
- 1.12.6 Institution of Electrical & Electronics Engineers (IEEE).
- 1.12.7 American Society for Testing & Materials (ASTM).
- 1.12.8 National Board of Fire Underwriters (NBFU).
- 1.12.9 National Board of Standards (NBS).
- 1.12.10 American National Standards Institute (ANSI).
- 1.12.11 Insulated Power Cable Engineers Association (IPECS).
- 1.12.12 Electrical Testing Laboratories (ETL).
- 1.12.13 National Electrical Safety Code (NESC).
- 1.12.14 2022 California Building Code (CBC), Part 2, Title 24 CCR.
- 1.12.15 2022 California Fire Code (CFC), Part 9, Title 24, CCR.
- 1.12.16 2022 NFPA 72 with California State Amendments
- 1.12.17 National Electrical Testing Association (NETA), 2010 or most current

DEFINITIONS

- 1.13 Concealed: Hidden from sight, as in trenches, chases, hollow construction, or above furred spaces, hung ceilings - acoustical or plastic type, or exposed to view only in tunnels, attics, shafts, crawl spaces, unfinished spaces, or other areas solely for maintenance and repair.
- 1.14 Exposed, Non-Concealed, Unfinished Space: A room or space that is ordinarily accessible only to building maintenance personnel, a room noted on the 'finish schedule' with exposed and unpainted construction for walls, floors, or ceilings or specifically mentioned as 'unfinished'.
- 1.15 Finish Space: Any space ordinarily visible, including exterior areas.

WORK AND MATERIALS

- 1.16 Unless otherwise specified, all materials must be new and of the best quality. Materials previously incorporated into other projects, salvaged, or refurbished are not considered new. Perform all labor in a thorough and workmanlike manner.
- 1.17 All materials provided under the contract must bear the UL label where normally available. Note that this requirement may be repeated under equipment specifications. In general, such devices as will void the label should be provided in separate enclosures and wired to the labeled unit in proper manner.

SHOP DRAWINGS AND SUBMITTALS

- 1.18 Submit shop drawings and all data in accordance with Division 1 of these specifications and as noted below for all equipment provided under this Division.
- 1.19 Shop drawings submittal demonstrate to the Architect that the Contractor understands the design concept. The Contractor demonstrates their understanding by indicating which equipment and material they intend to furnish and install and by detailing the

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fabrication and installation methods of material and equipment he intends to use. If deviations, discrepancies, or conflicts between submittals and specifications are discovered either prior to or after submittals are processed, notify the Architect immediately.

- 1.20 Manufacturer's data and dimension sheets shall be submitted giving all pertinent physical and engineering data including weights, cross sections and maintenance instructions. Standard items of equipment such as receptacles, switches, plates, etc., which are cataloged items, shall be listed by manufacturer.
- 1.21 Index all submittals and reference them to these specifications. All submittal items shall be assembled and submitted, one for each specification section. (Multiple specification sections may be grouped together in one common submittal binder, as long as each individual section is clearly identified.) Partial or incomplete submittal sections will not be reviewed.

EQUIPMENT PURCHASES

- 1.22 Arrange for purchase and delivery of all materials and equipment within 20 days after approval of submittals. All materials and equipment must be ordered in ample quantities for delivery at the proper time. If items are not on the project in time to expedite completion, the Owner may purchase said equipment and materials and deduct the cost from the contract sum.
- 1.23 Provide all materials of similar class or service by one manufacturer.

COOPERATIVE WORK

- 1.24 Correct without charge any work requiring alteration due to lack of proper supervision or failure to make proper provision in time. Correct without charge any damage to adjacent work caused by the alteration.
- 1.25 Cooperative work includes: General supervision and responsibility for proper location and size of work related to this Division, but provided under the other sections of these specifications, and installation of sleeves, inserts, and anchor bolts for work under each section in this Division.

VERIFICATION OF DIMENSIONS

- 1.26 Scaled and figured dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions, etc., and be responsible for properly fitting equipment and materials together and to the structure in spaces provided.
- 1.27 Drawings are essentially diagrammatic, and many offsets, bends, pull boxes, special fittings, and exact locations are not indicated. Carefully study drawings and premises in order to determine best methods, exact location, routes, building obstructions, etc. and install apparatus and equipment in manner and locations to avoid obstructions, preserve headroom, keep openings and passageways clear, and maintain proper clearances.

CLOSING-IN OF UNINSPECTED WORK

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- 1.28 Cover no work until inspected, tested, and approved by the Architect. Where work is covered before inspection and test, uncover it and when inspected, tested, and approved, restore all work to original proper condition at no additional cost to Owner.

EXCAVATION AND BACKFILL

- 1.29 All excavation and backfill shall be in accordance with Division 1 of these specifications and as noted below.
- 1.30 Perform all necessary excavation, shoring, and backfilling required for the proper laying of all conduits inside the building and premises, and outside as may be necessary.
- 1.31 Excavate all trenches open cut, keep trench banks as nearly vertical as practicable, and sheet and brace trenches where required for stability and safety. Excavate trenches true to line and make bottoms no wider than necessary to provide ample work room. Grade trench bottoms accurately. Machine grade only to the top line of the conduits, doing the remainder by hand. Do not cut any trench near or under footings without first consulting the Architect. All trenches shall be done in accordance with OSHA standards and regulations.
- 1.32 Backfilling shall be done with each layer compacted before another layer is added. No stones or coarse lumps shall be laid directly on a conduit or conduits.
- 1.33 Trenches shall be filled with the specified material. Sod, if any, shall be removed in cut sections and replaced in same manners.
- 1.34 Provide pumps and drainage of all open trenches for purposes of installing electrical duct and wiring.
- 1.35 Perform all backfilling in accordance with the requirements of and under the direction of the Geotechnical Engineer.
- 1.36 Where new underground trenching is required on sites or in any area where existing underground utilities exist, the Contractor shall provide an independent professional utility locating service to locate exact vertical and horizontal locations of all existing utilities. Where existing utilities are found the Contractor shall hand dig those areas to avoid disruption. The Contractor shall be responsible for immediate repairs to existing underground utilities damaged during construction. The Contractor shall repair all existing asphalt, concrete and landscape surfaces damaged or removed during construction to match their original conditions. Where trenching extends through public streets or roadways, the Contractor shall notify underground service alert in addition to the independent locating service 48 hours before start of construction to determine location of existing utilities by calling (800) 422-4133.

CONCRETE

- 1.37 Where used for structures to be provided under the contract such as bases, etc., concrete work, and associated reinforcing shall be as specified under Division 3 of these specifications.
- 1.38 See other sections for additional requirements for underground vaults, cable ducts, etc.

ACCESSIBILITY

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- 1.39 Install all control devices or other specialties requiring reading, adjustment, inspection, repairs, removal, or replacement conveniently and accessibly throughout the finished building.
- 1.40 All required access doors or panels in walls and ceilings are to be furnished and installed as part of the work under this Section. Refer to Division 1 of these specifications and as noted below.
- 1.41 Where located in fire rated assemblies, provide doors which match the rating of the assembly and are approved by the jurisdictional authority.
- 1.42 Refer to 'finish schedule' for types of walls and ceilings in each area and the architectural drawings for rated wall construction.
- 1.43 Coordinate work of the various sections to locate specialties requiring accessibility with others to avoid unnecessary duplication of access doors.

FLASHING

- 1.44 Flash and counter flash all conduits penetrating roofing membrane as shown on Architectural drawings. All work shall be in accordance with Division 7 of these specifications.

IDENTIFICATION OF EQUIPMENT

- 1.45 All electrical equipment shall be labeled, tagged, stamped, or otherwise identified in accordance with the following schedules:

1.45.1 General:

- 1.45.1.1 In general, the installed laminated nameplates as hereinafter called for shall also clearly indicate its use, areas served, circuit identification, voltage and any other useful data.

- 1.45.1.2 All auxiliary systems, including communications, shall be labeled to indicate function.

1.45.2 Lighting and Local Panelboards:

- 1.45.2.1 Panel identification shall be with white and black micarta nameplates. Letters shall be no less than 3/8" high.

- 1.45.2.2 Circuit directory shall be two column typewritten card set under glass or glass equivalent. Each circuit shall be identified by the room number and/or number of unit and other pertinent data as required.

1.45.3 Distribution Switchboards and Feeders Sections:

- 1.45.3.1 Identification shall be with 1" x 4" laminated white micarta nameplates with black lettering on each major component, each with name and/or number of unit and other pertinent data as required. Letters shall be no less than 3/8" high.

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1.45.3.2 Circuit breakers and switches shall be identified by number and name with 3/8" x 1-1/2" laminated micarta nameplates with 3/16" high letters mounted adjacent to or on circuit breaker or switch.

1.45.4 Disconnect Switches, Motor Starters and Transformers:

1.45.4.1 Identification shall be with white micarta laminated labels and 3/8" high black lettering.

1.45.5 All communication system terminal boxes including T.V., telephone/intercom, security, fire alarm, clock, and computer networking shall be provided with white micarta laminated labels and 3/8" high black lettering.

CONSTRUCTION FACILITIES

1.46 Furnish and maintain from the beginning to the completion all lawful and necessary guards, railings, fences, canopies, lights, warning signs, etc. Take all necessary precautions required by City, State Laws, and OSHA to avoid injury or damage to any persons and property.

1.47 Temporary power and lighting for construction purposes shall be provided under this Section. All work shall be in accordance with Division 1 of these specifications.

GUARANTEE

1.48 Guarantee all material, equipment and workmanship for all sections under this Division in writing to be free from defect of material and workmanship for one year from date of final acceptance, as outlined in the general conditions. Replace without charge any material or equipment proven defective during this period. The guarantee shall include performance of equipment under all site conditions, conditions of load, installing any additional items of control and/or protective devices, as required.

PATENTS

1.49 Refer to the General Conditions for Contractor's responsibilities regarding patents.

PLUMBING (DIVISION 22) / HEATING, VENTILATING, AND AIR CONDITONING (DIVISION 23) / ELECTRICAL – COORDINATION REQUIREMENTS

1.50 All electrical work performed for this project shall conform to the California Electrical Code, to Local Building Codes and in conformance with Division 22, 23, and 26 of these specifications, whether the work is provided under the "Plumbing", "Heating, Ventilating, and Air Conditioning", or the "Electrical" Division of these specifications. Where the Division 22 and/or Division 23 Contractor is required to provide electrical work, he shall arrange for the work to be done by a licensed Division 26 Contractor, using qualified electricians. The Division 22 and/or Division 23 Contractor shall be solely and completely responsible for the correct functioning of all equipment regardless of who provided the electrical work.

1.51 The work under Division 22 and/or Division 23 shall include the following:

1.51.1 All motors required by mechanical equipment.

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- 1.51.2 All starters for mechanical equipment which are not provided under the electrical division as part of a motor control center or otherwise indicated on the electrical drawings.
- 1.51.3 All wiring interior to packaged equipment furnished as an integral part of the equipment.
- 1.51.4 All control **wiring and conduit** for mechanical control systems.
- 1.51.5 All control systems required by mechanical equipment.
- 1.52 The work under Division 26 shall include the following:
 - 1.52.1 All power wiring and conduit; and conduit only for EMS control conductors between each building and the main control panel.
 - 1.52.2 Electrical disconnects as shown on the electrical drawings.
 - 1.52.3 Starters forming part of a motor control center.
- 1.53 All power wiring and conduit to equipment furnished under Division 22 and/or Division 23 shall be provided under Division 26. Control wiring and conduit, whether line voltage or low voltage, shall be provided under the division which furnishes the equipment.
- 1.54 Power wiring shall be defined as all wiring between the panelboard switchboard overcurrent device, motor control center starter or switch, and the safety disconnect switch or control panel serving the equipment. Also, the power wiring between safety disconnect switch and the equipment line terminals.
- 1.55 Control wiring shall be defined as all wiring, either line voltage or low voltage, required for the control and interlocking of equipment, including but not limited to wiring to motor control stations, solenoid valves, pressure switches, limit switches, flow switches, thermostats, humidistats, safety devices, smoke detectors, and other components required for the proper operation of the equipment.
- 1.56 All motor starters which are not part of motor control centers and which are required for equipment furnished under this Division shall be furnished and installed by the Division furnishing the equipment and power wiring connected under Division 26. Motor starters and control devices in motor control centers shall be furnished and installed under Division 26.
- 1.57 Division 26 Contractor shall make all final connections of power wiring to equipment furnished under this Division.
- 1.58 Wiring diagrams complete with all connection details shall be furnished under each respective Section.
- 1.59 Motor starters supplied by Plumbing and/or Heating, Ventilating and Air Conditioning shall be fused combination type minimum NEMA Size 1, and conform to appropriate NEMA standards for the service required. Provide NEMA type 3R/12 gasketed enclosures in wet locations. Provide all starters with appropriately sized overload protection and heater strips provided in each phase, hand/off auto switches, a minimum of 2 NO and NC auxiliary contacts as required, and an integral disconnecting means. For ½ horsepower motors and below, when control requirements do not dictate the use of a starter, a manual motor starter switch with overload protection in each phase may be

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provided. Acceptable manufacturers are Allen Bradley, General Electric, Square D, Furnas and Cutler Hammer.

EQUIPMENT ROUGH-IN

- 1.60 Rough-in all equipment, fixtures, etc. as designed on the drawings and as specified herein. The drawings indicate only the approximate location of rough-ins. Mounting heights of all switches, receptacles, wall mounted fixtures and such equipment must be coordinated with the Architectural Designs. The Contractor shall obtain all rough-in information before progressing with any work for rough-in connections. Minor changes in the contract drawings shall be anticipated and provided for under this Division of the specifications to comply with rough-in requirements.

OWNER FURNISHED AND OTHER EQUIPMENT

- 1.61 Rough-in and make final connections to all Owner furnished equipment shown on the drawings and specified, and all equipment furnished under other sections of the specifications.

EQUIPMENT FINAL CONNECTIONS

- 1.62 Provide all final connections for the following:
- 1.62.1 All equipment furnished under this Division.
 - 1.62.2 Electrical equipment furnished under other sections of the specification.
 - 1.62.3 Owner furnished equipment as specified under this Division.

INSERTS, ANCHORS, AND MOUNTING SLEEVES

- 1.63 Inserts and anchors must be:
- 1.63.1 Furnished and installed for support of work under this Division.
 - 1.63.2 Mounting of equipment that is of such size as to be free standing and that equipment which cannot conveniently be located on walls, such as motor starters, etc., shall be rigidly supported on a framework of galvanized steel angle of Unistrut or B-line systems with all unfinished edges painted.
 - 1.63.3 Furnish and install all sleeves as required for the installation of all work under all Sections of this Division and for all communication systems including any communication systems described in this Section which are bid to the General Contractor. Sleeves through floors, roof, and walls shall be as described in "Conduit and Fittings" Section 26 05 33.

SEISMIC ANCHORING

- 1.64 All switchgear and other free-standing electrical equipment or enclosures shall be anchored to the floor and braced at the top of the equipment to the structure. The Contractor shall submit drawings signed by the Contractor's registered structural Engineer indicating method of compliance prior installation.

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- 1.65 All sound systems, communication, signal or data networking equipment or enclosures shall be anchored to the structure. The Contractor shall submit drawings signed by the Contractors registered Structural Engineer indicating method of compliance prior to installation.

RUST PROOFING

- 1.66 Rust proofing must be applied to all ferrous metals and shall be in accordance with Section 05500 of these specifications and as noted below.

1.66.1 Hot-dipped galvanized shall be applied and after forming of angle-iron, bolts, anchors, etc.

1.66.2 Hot-dipped galvanized coating shall be applied after fabrication for junction boxes and pull boxes cast in concrete.

GENERAL WIRING

- 1.67 Where located adjacent in walls, outlet boxes shall not be placed back to back, nor shall extension rings be used in place of double boxes, all to limit sound transmission between rooms. Provide short horizontal nipple between adjacent outlet boxes, which shall have depth sufficient to maintain wall coverage in rear by masonry wall.

- 1.68 In those instances where outlet boxes, recessed terminal boxes, or recessed equipment enclosures are installed in a fire rated assembly, provide "Flamesafe FSD 1077" fire stopping pads or approved equal, over the outlet or box.

- 1.69 Complete rough-in requirements of all equipment to be wired under the contract are not indicated. Coordinate with respective trades furnishing equipment or with the Architect as the case may be for complete and accurate requirements to result in a neat, workmanlike installation.

SEPARATE CONDUIT SYSTEMS

- 1.70 Each electrical and signal system shall be contained in a separate conduit system as shown on the drawings and as specified herein. This includes each power system, each lighting system, each signal system of whatever nature, telephone, standby system, sound system, control system, fire alarm system, etc.

- 1.71 Further, each item of building equipment must have its own run of power wiring. Control wiring may be included in properly sized conduit for equipment feeders of #6 AWG and smaller, having separate conduit for larger sizes.

CLEANUP

- 1.72 In addition to cleanup specified under other sections, thoroughly clean all parts of the equipment. Where exposed parts are to be painted, thoroughly clean off any spattered construction materials and remove all oil and grease spots. Wipe the surface carefully and scrape out all cracks and corners.

- 1.73 Use steel brushes on exposed metal work to carefully remove rust, etc., and leave smooth and clean.

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- 1.74 During the progress of the work, keep the premises clean and free of debris.

PAINTING

- 1.75 Paint all unfinished metal as required in accordance with Division 1 of these specifications. (Galvanized and factory painted equipment shall be considered as having a sub-base finish.)
- 1.76 Paint all exposed conduit locations in finished spaces to match the finish on the surfaces they are attached to. Verify all color selections with the Architect prior to painting.

GENERAL DEMOLITION REQUIREMENTS

- 1.77 Remove existing work and items which are required to be removed in such manner that minimum damage and disturbance is caused to adjacent and connection work scheduled to remain. Repair or replace existing work schedule.
- 1.78 Include preparation of existing areas to receive new materials and removal of materials and equipment to alter or repair the existing building as indicated and as specified.
- 1.79 Perform demolition exercising proper care to prevent injury to the public, workmen and adjoining property.
- 1.80 Perform the removal, cutting, drilling of existing work with extreme care and use small tools in order not to jeopardize the structural integrity of the building.
- 1.81 Rebuild to existing condition or better, existing work which has to be removed to allow the installation of new work as required.
- 1.82 Remove, protect and reinstall existing items as indicated. Replace materials scheduled for reuse which are damaged by the Contractor to the extent that they cannot be reused, with equal quality material, and installation.
- 1.83 Do not reuse in this project materials and items removed from existing site or building, except with specific written approval by the Architect in each case, unless such removed material or item is specifically indicated or specified to be reused.
- 1.84 Remove materials and equipment indicated to be salvaged for reinstallation and store to prevent damage and reinstall as the work progresses. Do not reuse in this project, other materials and equipment removed from existing site or building, except with specific written approval by the Architect in each case.
- 1.85 Patch areas requiring patching, including damage caused by removing, relocating or adding fixtures and equipment, damages caused by demolition at adjacent materials.
- 1.86 Do not stockpile debris in the existing building, without the approval of the Architect. Remove debris as it accumulates from removal operations to a legal disposal area.
- 1.87 Contractor to assume existing oil filled and dry transformers, oil switches, ballasts, lamps, wooden poles, cross arms, computers, computer monitors, and conductor insulation containing materials considered hazardous. Comply with local, state and federal regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution. Contractor shall be responsible for removal of the

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above hazardous materials where encountered. Include all costs for such removal as part of this contract.

- 1.88 All fluorescent, compact fluorescent, high intensity discharge, metal halide, mercury vapor, high and low-pressure sodium, and neon lamps are to be disposed of as required by the California Waste Rule Regulations as described in the California Code of Regulations, Title 22, Division 4.5 and Chapter 23.
- 1.89 **Communication System:** Where new communication systems, (including telephone, intercom, clock, security, fire alarm, data, multimedia, CATV or lighting controls) are installed to replace existing systems, unless where otherwise directed the existing systems shall remain fully operational until the new system has been installed and tested. Demolition of the existing systems shall include removal of all equipment and associated wiring and exposed conduits and providing new blank covers for all abandoned device locations.
- 1.90 **Salvage Power Equipment:** The Contractor shall carefully remove all existing switchboards, panelboards, transformers, and confirm in writing which items the Owner wishes to keep. These items shall be transported to the Owner's maintenance facilities by the Contractor. All remaining items shall be disposed of by the Contractor.
- 1.91 **Salvage Lighting Equipment:** The Contractor shall confirm in writing which items the Owner wishes to keep. These items shall be transported to the Owner's maintenance facilities by the Contractor. All remaining items shall be disposed of by the Contractor.
- 1.92 **Salvage Communication Equipment:** The Contractor shall carefully remove all communication devices (telephone, intercom, clock, security, fire alarm, data, multimedia, CATV or lighting controls) and box each type of devices separately. The Contractor shall deliver all items to the Owner's maintenance facility.

PROJECT CLOSEOUT

- 1.93 Prior to completion of project, compile a complete equipment maintenance manual for all equipment supplied under sections of this Division, in accordance with Division 1 of these specifications and as described below.
- 1.94 Equipment Lists and Maintenance Manuals:
 - 1.94.1 Prior to completion of job, Contractor shall compile a complete equipment list and maintenance manuals. The equipment list shall include the following items for every piece of material equipment supplied under this Section of the specifications:
 - 1.94.1.1 Name, model, and manufacturer.
 - 1.94.1.2 Complete parts drawings and lists.
 - 1.94.1.3 Local supply for parts and replacement and telephone number.
 - 1.94.1.4 All tags, inspection slips, instruction packages, etc., removed from equipment as shipped from the factory, properly identified as to the piece of equipment it was taken from.

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- 1.95 Maintenance manuals shall be furnished for each applicable section of the specifications and shall be suitably bound with hard covers and shall include all available manufacturers' operating and maintenance instructions, together with "as-built" drawings to properly operate and maintain the equipment. The equipment lists and maintenance manuals shall be submitted in duplicate to the Architect for approval not less than 10 days prior to the completion of the job. The maintenance manuals shall also include the name, address, and phone numbers of all subcontractors involved in any of the work specified herein. Four copies of the maintenance manuals bound in single volumes shall be provided.

RECORD DRAWINGS

- 1.96 The Division 26 Contractor shall maintain record drawings as specified in accordance with Division 1 of these specifications, and as noted below.
- 1.97 Drawings shall show locations of all concealed underground conduit runs, giving the number and size of conduit and wires. Underground ducts shall be shown with cross section elevations and shall be dimensioned in relation to permanent structures to indicate their exact location. Drawing changes shall not be identified only with referencing CORs and RFIs, the drawings shall reflect all of the actual additions or changes made. All as-built drawing information shall be prepared by the contractor in AutoCAD, updating the contract computer files as needed to reflect actual installed conditions for all site plans, lighting, power, communication, networking, audio visual, security or fire alarms systems included in the scope of work for this project.
- 1.98 One set of these record drawings shall be delivered to the Architect. The engineer will review documents for completeness and will not be responsible for editing contractor computer files.

CHANGES AND EXTRA WORK

- 1.99 When **changes** in work are requested, the Division 26 Contractor shall provide unit prices for the work involved in accordance with Division 1 of these specifications, and the following:
- 1.99.1 The material Costs shall **not exceed** the invoice pricing from an Electrical Distributor indicating the pricing provided at the time of bid. The Contractor shall submit a print out copy of the pricing with the change order to substantiate these values.
- 1.99.2 The labor Costs shall **not exceed** the latest edition of the "NECA Manual of Labor Units" **normal column**.
- 1.100 When **credits** in work are requested, the Division 26 Contractor shall provide unit prices for the work involved in accordance with Division 1 of these specifications, and the following:
- 1.100.1 The Material Costs shall **not be less than 80% of** the invoice pricing from an Electrical Distributor indicating the pricing provided at the time of bid. Restocking fees may also be included in this amount where applicable.
- 1.100.2 The Labor Costs shall **not be less than 80% of** the latest edition of the "NECA Manual of Labor Units" **normal column**.
- 1.101 Conduit pricing for conduits of all types sized 3" or smaller.

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When changes in the scope of work require the Contractor to estimate conduit Installations, they shall **NOT include labor values (only material cost may be included)** for any of the below items. The labor values for conduit installation represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

1.101.1 Couplings.

1.101.2 Set Screw or Compression Fittings, locknuts, Bushings and washers.

1.101.3 Conduit straps and associated screws or nails.

1.101.4 LB fittings or other specialty fittings or specialty mounting hardware may be included where needed.

1.102 Wire pricing for all types and sizes.

When changes in the scope of work require the Contractor to estimate wire installations, they shall **NOT include labor values (only material cost may be included)** for any of the below items. The labor values for wire installation represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

1.102.1 Locknuts, Bushings, tape, wire markers.

1.103 When changes in the scope of work require other equipment installations such as lighting fixtures, panelboards, switchboards, wiring devices, communications equipment etc. the Contractor shall **NOT include labor values (only material cost may be included)** for any of the below items. The labor values for these equipment items represented in the NECA manual are inflated to a point where additional labor for the below items can not be justified.

1.103.1 Associated screws, nails, bolts, anchors or supports.

1.103.2 Locknuts, washers, tape.

1.104 The total labor hours for extra work will be required to be calculated as follows:

1.104.1 Change orders with 1 to 30 total labor hours

General Laborer	10%	of total labor hours
Journeyman	10%	of total labor hours
Foreman	80%	of total labor hours

1.104.2 Change orders with 31 to 100 total labor hours

General Laborer	20%	of total labor hours
Journeyman	40%	of total labor hours
Foreman	40%	of total labor hours

1.104.3 Change orders with over 100 total labor hours

General Laborer	30%	of total labor hours
Journeyman	50%	of total labor hours
Foreman	20%	of total labor hours

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- 1.105 When change orders are issued which allow the work to be completed in the normal sequence of construction, the labor rates shall be based on the most current "Prevailing Wage" – straight time total hourly rate. When change orders require the Contractor to work out of sequence the "Prevailing Wage"– daily overtime hourly rate shall apply. Special condition situations shall be reviewed on an individual basis for alternate hourly rate schedules.
- 1.106 Costs **will not** be permitted for additional supervision on site or office time for processing any change order other than the 10% overhead allowance as described in Division 1. Cost for special equipment required to install items for an individual change order are permitted and must be individually identified. Lump Sum cost for small tools or any other cost not specifically required for the change order are **not** permitted.
- 1.107 Contractor estimates shall be formatted to clearly identify each of the following:
- 1.107.1 Line item description of each type of material or labor item.
 - 1.107.2 Description of quantity for each item.
 - 1.107.3 Description of (material cost per / quantity).
 - 1.107.4 Description of (labor cost per / quantity).
 - 1.107.5 Description of total labor hour breakdown per Foreman, Journeyman or General Laborer as described above.

ELECTRONIC FILES

- 1.108 The Contractor shall make a **written** request directly to Johnson Consulting Engineers for electronic drawing files. As a part of the written request, please include the following information:
- 1.108.1 Clearly indicate each drawing sheet needed (i.e., E1.1, E2.1, etc.).
 - 1.108.2 Identify the name, phone number, mailing address and e-mail address of the person to receive the files.
 - 1.108.3 Provide written confirmation and agreement with the requirements described for payment of computer files, as described below.
- 1.109 Detail or riser diagram sheets, or any other drawings other than floor plans or site plans, **will not be made available to the Contractor.**
- 1.110 Files will only be provided in the AutoCAD format in which they were created.
- 1.111 Requests for files will be processed as soon as possible; a minimum of 7 working days should be the normal processing time. The Contractor shall be completely responsible for requesting the files in time for their use.

END OF SECTION

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SECTION 26 0519
POWER CONDUCTORS

PART 1 – GENERAL

- 1.1 Furnish and install wire and cable for branch circuits and feeders specified herein and as shown on the electrical drawings.
- 1.2 Submittals: Submit manufacturers' data for the following items:
 - 1.2.1 All cables and terminations
- 1.3 **Common submittal mistakes which will result in the submittals being rejected:**
 - 1.3.1 Not including all items listed in the above itemized description.
 - 1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining, or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.3 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed

PART 2 – PRODUCTS

- 2.1 Wire and cable Rated 120 volt to 600 volt.
 - 2.1.1 All wire and cable shall be new, 600 volt insulated copper, of types specified below for each application. All wire and cable shall bear the UL label and shall be brought to the job in unbroken packages. Wire insulation shall be the color as specified herein and shall be type THWN-2. Insulated conductors shall be installed in all exterior exposed raceways. Conductors for branch circuit lighting, receptacle, power and miscellaneous systems shall be a minimum of No. 12 AWG. Increase conductor size to No. 10 AWG for 120 volt circuits greater than 100 feet from the panel to the load and for 277 volt circuits greater than 200 feet from the panel to the load. Circuit homeruns indicated to be larger than No. 12 must be increased the entire length of the circuit, including equipment grounding conductor. Wire sizes No. 14 through No. 10 shall be solid. No. 8 and larger shall be stranded.
 - 2.1.2 Aluminum conductors will be permitted (only where specifically identified on the drawings. See "600 Volt Feeder Schedule") in sizes 2/0 or larger. Conductors shall be listed by Underwriters Laboratories (UL) and suitable for operation at 600 volts or less, at a maximum operating temperature of 90N C maximum in wet or dry locations. Conductors shall be marked "SUN-RES". Aluminum alloy conductors shall be compact stranded conductors of STABILOY® (AA-8030) as manufactured by Alcan Cable or Listed equal. AA-8000 Series aluminum alloy conductor material shall be recognized by The Aluminum Association

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2.2 Wire and cable for systems below 120 volts.

- 2.2.1 All low voltage and communications systems cables routed underground shall be provided with a moisture resistant outer jacket, West Penn "Aquaseal" or equal, unless otherwise specified.

PART 3 - EXECUTION

- 3.1 Wire and cable shall be pulled into conduits without strain using powdered soapstone, mineralac, or other approved lubricant. In no case shall wire be repulled if same has been pulled out of a conduit run for any purpose. No conductor shall be pulled into conduit until conduit system is complete, including junction boxes, pull boxes, etc.

- 3.2 All connections of wires shall be made as noted below:

- 3.2.1 Connections to outlets and switches: Wire formed around binding post of screw.

- 3.2.2 No. 10 wire and smaller: Circuit wiring connections to lighting fixtures and other hard wired equipment shall be made with pressure type solderless connectors, Buchanan, Scotchlock, Wing Nut, or approved equal. Alternate "WAGO" #773 series or "IDEAL" #32, 33, 34 and 39 series push wire style connectors are also acceptable.

- 3.3 All wiring shall be continuous without splicing unless where specifically noted on the drawings or where permitted below.

- 3.3.1 No. 10 wire and smaller above grade: Quantities as needed, connection made with pressure type solderless connectors, Scotchlock or equal.

- 3.3.2 No. 10 wire and smaller below grade: Quantities as needed, connection made with 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat shrink, sealant coated splice kit. Alternate products must be UL listed for direct burial/submersible and rated to (1000V).

- 3.3.3 No. 8 wire and larger above grade: Quantities only where indicated, 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat shrink, sealant coated splice kit. Alternate products must be UL listed for direct burial/submersible and rated to (1000V).

- 3.3.4 No. 8 wire and larger below grade: Quantities only where indicated, 'Raychem' long barrel compression terminals with crimping tool and quantity of crimps as recommended by manufacturer, provide 'Raychem' WCSM-S series in-line heat shrink, sealant coated splice kit. Alternate products must be UL listed for direct burial/submersible and rated to (1000V).

- 3.4 All wiring throughout shall be color coded as follows:

480 volt system

208 or 240 volt system

A Phase
B Phase

Brown
Orange

Black
Red

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C Phase	Yellow	Blue
Neutral	Grey	White
Ground	Green	Green

- 3.5 Wiring must be color coded throughout its entire length, except feeders may have color coded plastic tape at both ends and any other accessible point.
- 3.6 All control wiring in a circuit shall be color coded, each phase leg having a separate color, and with all segments of the control circuit, whether in apparatus or conduit, utilizing the same color coding.
- 3.7 At all terminations of control wiring, the wiring shall have a numbered T&B or Brady plastic wire marker.
- 3.8 Cables when installed are to be properly trained in junction boxes, etc., and in such a manner as to prevent any forces on the cable which might damage the cable.
- 3.9 All conductors to be installed into a common raceway, shall be pulled into the raceway at the same time.
- 3.10 All conductors shall be installed in such a manner as to not exceed the manufacturers' recommended pulling tension and bending radius. The equipment used for pulling must be specifically designed for the purpose. Motorized vehicles such as pickup trucks, are not acceptable.

END OF SECTION

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SECTION 26 0526
GROUNDING

PART 1 – GENERAL

- 1.1 Furnish and install grounding and grounding conductors and electrodes as specified herein and as shown on the drawings.
- 1.2 Submit catalog data for all components.
- 1.3 **Common submittal mistakes which will result in the submittals being rejected:**
 - 1.3.1 Not including all items listed in the above itemized description.
 - 1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.3 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – EXECUTION

- 2.1 Grounding
 - 2.1.1 All panelboard cabinets, equipment, enclosures, and complete conduit system shall be grounded securely in accordance with pertinent sections of CEC Article 250. Conductors shall be copper. All electrically operated equipment shall be bonded to the grounded conduit system. All non-current carrying conductive surfaces that are likely to become energized and subject to personal contact shall be grounded by one or more of the methods detailed in CEC Article 250. All ground connections shall have clean contact surfaces. Install all grounding conductors in conduit and make connections readily accessible for inspection.
 - 2.1.2 Provide an insulated equipment grounding conductor in all branch circuit and feeder raceway systems, sized in accordance with CEC 250-122.
 - 2.1.3 Provide an additional individual insulated grounding conductor for each circuit which contains an isolated ground receptacle or surge suppression receptacle.
 - 2.1.4 Grounding of metal raceways shall be assured by means of provisions of grounding bushings on feeder conduit terminations at the panelboard, and by means of insulated continuous stranded copper grounding wire extended from the ground bus in the panelboard to the conduit grounding bushings.
 - 2.1.5 Except for connections which access for periodic testing is required, make grounding connections which are buried or otherwise inaccessible by exothermite type process.

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2.1.6 The following ohmic values shall be test certified for each item listed. A written report signed and witnessed by the project IOR shall be provided to the engineer. If the ohmic value listed cannot be obtained additional grounding shall be installed to reach the value listed.

2.1.6.1 Service. 10 ohms.

2.1.6.2 Step down transformers and non-current carrying metal parts
..... 25 ohms.

2.1.6.3 Manholes, handholes, etc.
..... 10 ohms.

END OF SECTION

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SECTION 26 0533
CONDUIT AND FITTINGS

PART 1 – GENERAL

- 1.1 Furnish and install conduit and fittings as shown on the drawings and as specified herein.
- 1.2 Submit Manufacturer's data on the following:
 - 1.2.1 Conduit.
 - 1.2.2 Fittings
 - 1.2.3 Fire stopping Material.
 - 1.2.4 Surface Raceways.
 - 1.2.5 Type MC or MC-PCS cable, provide construction details and UL "E" number.
- 1.3 **Common submittal mistakes which will result in the submittals being rejected:**
 - 1.3.1 Not including all items listed in the above itemized description.
 - 1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.3 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

- 2.1 Rigid steel conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT) and flexible metallic conduit shall be steel, hot dipped galvanized after fabrication.
- 2.2 PVC conduit shall be Carlon or approved equal.
- 2.3 Liquid tight flexible metal conduit shall be Anaconda Sealtite type UA or approved equal. Fittings shall be Appleton, Crouse-Hinds, Steel City, T&B, or equivalent.
- 2.4 MC type armored cable, shall not be used
- 2.5 Fire stopping material shall provide an effective seal against fire, heat, smoke and fire gases. Fire stopping material shall be tested to comply with ASTM E 814 and UL 1479. The submittal for this product shall include the UL listed system number and installation requirements for each type of penetration seal required for this project.
- 2.6 Each length of conduit shall be stamped with the name or trademark of the manufacturer and shall bear the UL label.

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- 2.7 All plastic conduit shall be rigid, schedule 40, heavy wall PVC. All PVC conduit shall be UL listed. Underground utility company conduits shall comply with local utility co. requirements.
- 2.8 Plastic conduit shall be stored on a flat surface, and protected from the direct rays of the sun.
- 2.9 Where branch circuit or communication raceways cannot be concealed in ceilings or walls and are required to be exposed in interior spaces, provide nonmetallic surface raceway system sized per the manufacturer capacity requirements. A full complement of nonmetallic fittings must be available and matching device boxes and cover plates must be provided. The color of the raceway system, components and boxes shall be (white). Where data networking cabling is to be installed, all raceway fittings shall meet Category 5 radius requirements. Where specific raceway types have been noted on the drawings they shall be as follows:

2.9.1	System 'SR'	Hubbell Wiremold Panduit Hellerman-Tyton	WALLTRAK 1 series ECLIPSE PN05series LD5 series TSR2 series
2.9.2	System 'SR2'	Hubbell Wiremold Panduit Hellerman-Tyton	WALTRAK 22 2300D Series D2P10 TSR3 series
2.9.3	System 'SR3'	Hubbell Wiremold Panduit Hellerman-Tyton	BASETRAK series 5400 - series 70 series MCR Infostream" series

Provide with offset boxes, inline boxes may only be used where specifically shown on the drawings.

PART 3 – FITTINGS

- 3.1 All metallic fittings, including those for EMT, flexible conduit, or malleable iron. Die cast fittings of any other material are not permitted.
- 3.2 Locknuts shall be steel or malleable iron with sharp clean cut threads.
- 3.3 Entrance seals shall be 0.Z. type FSK or equivalent.
- 3.4 Bushings and locknuts: Where conduits enter boxes, panels, cabinets, etc., they shall be rigidly clamped to the box by locknuts on the outside, and a lock nut and plastic bushing on the inside of the box. All conduits shall enter the box squarely.
- 3.5 Furnish and install insulated bushings as per CEC article No. 300 - 4 (F) on all conduits. The use of insulated bushings does not exclude the use of double locknuts to fasten conduit to the box.
- 3.6 Transition from plastic to steel conduits shall be with PVC female threaded adaptors.

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- 3.7 Couplings and connectors for rigid steel or IMC conduit must be threaded, or compression type (set screw fittings are not permitted).
- 3.8 Couplings and connectors for EMT shall be compression, watertight. Set screw connectors are not acceptable, except for systems below 120 volts.
- 3.9 Connectors for flexible metal conduit shall be steel or malleable iron with screw provided to clinch the conduit into the adapter body. For sizes up to ¾" a screw-in, "Jake type," fitting may be used.
- 3.10 Install approved expansion fittings, or liquid tight flex conduit with a minimum 6" slack for conduits passing through all expansion and seismic joints.

PART 4 - EXECUTION

- 4.1 All branch circuits shall be installed concealed in walls or above ceilings or in concrete floor slabs. PVC conduits installed in concrete floor slabs shall transition to PVC coated rigid steel where conduits penetrate above finished grade or finished floor.
- 4.2 Conduit sizes for various numbers and sizes of wire shall be as required by the CEC, but not smaller than ½" for power wiring and ¾" for communications and fire alarm systems unless otherwise noted. Conduit in slab or below grade shall be ¾" minimum trade size, unless otherwise identified.
- 4.3 Conduit size shall be such that the required number and sizes of wires can be easily pulled in and the Contractor shall be responsible for the selection of the conduit sizes to facilitate the ease of pulling. Conduit sizes shown on the drawings are minimum sizes in accordance with appropriate tables in the CEC. If because of bends or elbows a larger conduit size is required, the Contractor shall so furnish without further cost to the Owner.
- 4.4 The Contractor shall be entirely responsible for the proper protection of this work from the other trades on the job. When conduit becomes bent or holes are punched through same, or outlets moved after being roughed-in, the Contractor shall replace same, without additional cost to the Owner.
- 4.5 Rigid steel conduit or IMC shall be used as follows:
 - 4.5.1 Exposed exterior locations.
 - 4.5.2 Exposed interior locations below eight feet above floor, except in electrical rooms and closets.
 - 4.5.3 In hazardous or classified areas as required by CEC.
- 4.6 EMT conduit shall be used for areas as follows:
 - 4.6.1 All interior communications, signal, and data networking systems.
 - 4.6.2 All interior power wiring systems where not required to be in rigid steel, IMC or flexible conduit.
- 4.7 Flexible conduit shall be used for areas as follows:

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- 4.7.1 To connect motors, transformers, and other equipment subjected to vibration or where specifically detailed on the drawings.
- 4.7.2 Flexible conduit shall not be used to replace EMT in other locations where the conduit will be exposed.
- 4.7.3 Flexible metal conduit shall be ferrous. Installation shall be such that considerable slack is realized. The conduit shall contain separate code sized grounding conductor.
- 4.7.4 Liquid tight flexible conduit shall be used in conformance with CEC in lengths not to exceed 4'. For equipment connections, route the conduit at 90 degrees to the adjacent path for point of connection. The conduit shall contain separate code sized grounding conductor. Use liquid tight flexible conduit for all equipment connections exposed in possible wet, corrosive or oil contaminated areas, e.g., shops and outside areas.
- 4.8 Plastic conduit shall be used for all exterior underground, in slab, and below slab on grade conduit installations. Install bell ends at all conduit terminations in manholes and pull boxes. Where plastic conduit transitions from below grade to above grade, no plastic conduit shall extend above finished exterior grade, or above interior finished floor level.
- 4.9 Plastic conduit joints shall be made up in accordance with the manufacturer's recommendations for the particular conduit and coupling selected. Conduit joint couplings shall be made watertight. Plastic conduit joints shall be made up by brushing a plastic solvent cement on the inside of a plastic fitting and on the outside of the conduit ends. The conduit and fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly.
- 4.10 All underground conduit depths shall be as detailed on the drawings or a minimum of 30" below finished grade (when not specifically detailed otherwise), for all exterior underground conduits. Where concrete slurry or concrete encasement is provided, include "Red" color dye in mixture.
- 4.11 All underground conduits for power systems (600v and higher), shall be concrete encased and a minimum of 48" below grade or as detailed on the drawings. Where concrete slurry or concrete encasement is provided, include "Red" color dye in mixture.
- 4.12 Conduit shall be continuous from outlet to outlet, cabinet or junction box, and shall be so arranged that wire may be pulled in with the minimum practical number of junction boxes.
- 4.13 All conduits shall be concealed wherever possible. All conduit runs may be exposed in mechanical equipment rooms, electrical equipment rooms, electrical closets, and in existing or unfinished spaces. No conduit shall be run exposed in finished areas without the specific approval of the Architect.
- 4.14 All raceways which are not buried or embedded in concrete shall be supported by straps, clamps, or hangers to provide a rigid installation. Exposed conduit shall be run in straight lines at right angles to or parallel with walls, beams, or columns. In no case shall conduit be supported or fastened to other pipes or installed to prevent the ready removal of other trades piping. Wire shall not be used to support conduit.
- 4.15 It shall be the responsibility of the Contractor to consult the other trades before installing conduit and boxes. Any conflict between the location of conduit and boxes, piping, duct

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work, or structural steel supports, shall be adjusted before installation. In general, large pipe mains, waste, drain, and steam lines shall be given priority.

- 4.16 Conduits above lay-in grid type ceilings shall be installed in such a manner that they do not interfere with the "lift-out" feature of the ceiling system. Conduit runs shall be installed to maintain the following minimum spacing wherever practical.

4.16.1 Water and waste piping not less than 3".

4.16.2 Steam and steam condensate lines not less than 12".

4.16.3 Radiation and reheat lines not less than 6".

- 4.17 Provide all necessary sleeves and chases required where conduits pass through floors or walls as part of the work of this section. Core drilling will only be permitted where approved by the Architect.

- 4.18 All empty conduits and surface mounted raceways shall be provided with a ¼" polypropylene plastic pull cord and threaded plastic or metal plugs over the ends. Fasten plastic "Dymo" tape label to exposed spare conduit to identify "power" or "communication" system, and to where it goes.

- 4.19 The ends of all conduits shall be securely plugged, and all boxes temporarily covered to prevent foreign material from entering the conduits during construction. All conduit shall be thoroughly swabbed out with a dry swab to remove moisture and debris before conductors are drawn into place.

- 4.20 Bending: Changes in direction shall be made by bends in the conduit. These shall be made smooth and even without flattening the pipe or flaking the finish. Bends shall be of as long a radius as possible, and in no case smaller than CEC requirements.

4.20.1 For power conduits for conductors (600v and below), provide minimum 36" radius (vertical) and 72" radius (horizontal) bends.

4.20.2 For power conduits for conductors (greater than 600v), provide minimum 72" radius (vertical) and 72" radius (horizontal) bends.

- 4.21 Supports: Conduit shall be supported at intervals as required by the California Electrical Code. Where conduits are run individually, they shall be supported by approved conduit straps or beam clamps. Straps shall be secured by means of toggle bolts on hollow masonry, machine screws or bolts on metal surfaces, and wood screws on wood construction. No perforated straps or wire hangers of any kind will be permitted. Where individual conduits are routed, or above ceilings, they shall be supported by hanger rods and hangers. Conduits installed exposed in damp locations shall be provided with clamp backs under each conduit clamp, to prevent accumulation of moisture around the conduits.

- 4.22 Where a number of conduits are to be run exposed and parallel, one with another, they shall be grouped and supported by trapeze hangers. Hanger rods shall be fastened to structural steel members with suitable beam clamps or to concrete inserts set flush with surface. A reinforced rod shall be installed through the opening provided in the concrete inserts. Beam clamps shall be suitable for structural members and conditions. Rods shall be galvanized steel 3/8" diameter minimum. Each conduit shall be clamped to the trapeze hanger with conduit clamps.

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- 4.23 All concrete inserts and pipe clamps shall be galvanized. All steel bolts, nuts, washers, and screws shall be galvanized or cadmium plated. Individual hangers, trapeze hangers and rods shall be prime-coated.
- 4.24 Openings through fire rated floors/walls and/or smoke walls through which conduits pass shall be sealed by Fire stopping material to comply with Division 1 to seal off flame, heat, smoke and fire gases. Sleeves shall be provided for power or communication system cables which are not installed in conduits, and shall be sealed inside and out to comply with manufacturers UL system design details. Where multiple conduits and/or cable tray systems pass thru fire-rated walls at one location, the Contractor shall submit copies of the manufacturers UL system design details proposed for use on this project. All Fire stopping material shall have an hourly fire-rating equal to or higher than the fire rating of the floor or wall through which the conduit, cables, or cable trays pass.
- 4.25 Provide cap or other sealing type fitting on all spare conduits. Conduits stubbed into buildings from underground where cable only extends to equipment, the conduit/cable end shall be sealed to prevent moisture from entering the room or space.
- 4.26 All conduits which are part of a paralleled feeder or branch circuit shall be installed underground.
- 4.27 All conduits which are required as a part of systems specified in Divisions 27 or 28, or any other low voltage communication systems, shall be furnished and installed by the Division 26 Contractor.
- 4.27.1 The Contractor shall coordinate all conduit requirements with each system supplier prior to bid to determine special conduit system requirements.
- 4.27.2 The Contractor shall provide a pull rope in all conduits for these systems.
- 4.27.3 The Contractor shall provide conduit sleeves for all open cable installations thru rated walls or block walls. Provide conduit from each building main termination cabinet or backboard to the nearest accessible ceiling for access into all electrical or communications rooms.
- 4.28 In addition to the above requirements, the following requirements shall apply to all data networking conduits:
- 4.28.1 Flexible metal conduit may only be used where required at building seismic and/or expansion joints.
- 4.28.2 All underground conduits shall be provided with minimum 24" radius elbows (vertical) and 60" (horizontal).
- 4.28.3 No length of conduit above grade shall be installed to exceed 150 feet between pull boxes, or points of connection, unless where specifically detailed on the drawings.
- 4.28.4 No length of conduit shall be installed to exceed two 90 degree bends between pull boxes, or points of connection, unless where specifically detailed on the drawings.

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- 4.29 Where surface raceways are installed in interior spaces, the Contractor shall take care to route in straight lines at right angles to or parallel with walls, beams, or columns. All raceways and device boxes shall be securely screwed to the finish surface with zinc screw "Auger" anchors Stk #ZSA1K by Gray Bar Electric or equal. Tape adhesive application will not be permitted.
- 4.30 The Contractor who installs surface raceway systems shall provide and install complete with wire retention clips, one for every (8) vertical feet or (5) horizontal feet or portion thereof. This Contractor shall also provide each raceway channel with pull strings.
- 4.31 It shall be the responsibility of the Contractor installing the raceway to coordinate the installation of raceway device plates and inserts with the communications or data contractors.

END OF SECTION

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SECTION 26 0534
OUTLET AND JUNCTION BOXES

PART 1 – GENERAL

- 1.1 Furnish and install electrical wiring boxes as specified and as shown on the electrical drawings.
- 1.2 Submit manufacturer's data for all items.
- 1.3 **Common submittal mistakes which will result in the submittals being rejected:**
 - 1.3.1 Not including all items listed in the above itemized description.
 - 1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.3 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements, or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

- 2.1 Boxes shall be as manufactured by Steel City, Appleton, Raco, or approved equal.
- 2.2 All boxes must conform to the provisions of Article 370 of the CEC. All boxes shall be of the proper size to accommodate the quantity of conductors enclosed in the box. Minimum box size shall be 4" square x 1-½" deep.
- 2.3 Boxes generally shall be hot dipped galvanized steel with knockouts. Boxes on exterior surfaces or in damp locations shall be corrosion resistant, cast ferrous and shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Boxes shall be Appleton Type FS, Crouse-Hinds, or the approved equal. Conduit bodies shall be corrosion resistant, cast malleable iron. Conduit bodies shall have threaded hubs for rigid conduit and neoprene gaskets for their covers. Conduit bodies shall be Appleton Unilets, Crouse-Hinds, or the approved equal. Where recessed, boxes shall have square cut corners.
- 2.4 Deep boxes shall be used in wall covered by wainscot or paneling and in walls or glazed tile, brick, or other masonry which will not be covered with plaster. Through the wall type boxes shall not be used unless specifically called for. All boxes shall be nongangable. Boxes in concrete shall be of a type to allow the placing of conduit without displacing the reinforcing bars. All lighting fixture outlet boxes shall be equipped with the proper fittings to support and attach a light fixture.
- 2.5 All light, switch, receptacle, fire alarm devices and similar outlets shall be provided with approved boxes, suitable for their function. Back boxes shall be furnished and installed as required for the equipment and/or systems under this contract.

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- 2.6 Pull and junction boxes shall be code gauge boxes with screw covers. Boxes shall be rigid under torsional and deflecting forces and shall be provided with angle from framing where required. Boxes shall be 4" square with a blank cover in unfinished areas and with a plaster ring and blank cover in finished areas. Covers for flush mounted oversize boxes shall extend $\frac{3}{4}$ " past boxes all around. Covers for 4" square boxes shall extend $\frac{1}{4}$ " past box all around.
- 2.7 All terminal cabinets and junction boxes or equipment back boxes which are required as a part of systems specified in Divisions 27 or 28, or any other low voltage communication systems, shall be furnished and installed by the Division 26 Contractor.
- 2.7.1 The Division 26 Contractor shall coordinate all box requirements with each system supplier prior to bid to determine special cabinet or back box requirements. The Contractor shall also provide stainless steel blank cover plates for all low voltage systems installed for future equipment.
- 2.7.2 The Contractor shall provide all plywood backboards indicated on walls or inside equipment enclosures. All backboards shall be a minimum of $\frac{3}{4}$ " thick fire rated type plywood.
- 2.7.3 The Contractor shall coordinate exact rough in locations and requirements with each system supplier.
- 2.8 In addition to the above requirements, boxes for data networking wiring and equipment shall comply with the following:
- 2.8.1 All boxes shall be a minimum of 4-11/16" square x 2-1/8" deep.
- 2.8.2 Where pull boxes are required on individual conduits 1-1/4" or smaller, provide 4-11/16" square x 2-1/8" deep boxes. Where pull boxes are required on conduits larger than 1-1/4" for straight pull through, provide eight times the conduit trade size for box length. Where pull boxes are required on conduits larger than 1-1/4" for an angle or a U-pull through installation, provide a minimum distance of six times the conduit trade size between the entering and exiting conduit run for each cable.
- 2.9 Recessed boxes installed in fire rated floors/walls and /or smoke walls shall be sealed by Fire stopping material to comply with Division 1 to seal off flame, heat, smoke and fire gases. The Contractor shall submit copies of the manufacturers UL system design details proposed for use on this project. All Fire stopping material shall have an hourly fire-rating equal to or higher than the fire rating of the floor or wall through which the conduit, cables, or cable trays pass.

PART 3 – EXECUTION

- 3.1 Boxes shall be installed where required to pull cable or wire, but in finished areas only by approval of the Architect. Boxes shall be rigidly attached to the structure, independent of any conduit support. Boxes shall have their covers accessible. Covers shall be fastened to boxes with machine screws to ensure continuous contact all around. Covers for surface mounted boxes shall line up evenly with the edges of the boxes.
- 3.2 Outlets are only approximately located on the plans and great care must be used in the actual location of the outlets by consulting the various detailed drawings and specifications. Outlets shall be flush with finished wall or ceiling, boxes installed

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symmetrically on such trim or fixture. Refer to drawings for location and orientation of all outlet boxes.

- 3.3 Furnish and install all plaster rings as may be required. Plaster rings shall be installed on all boxes where the boxes are recessed. Plaster rings shall be of a depth to reach the finished surface. Where required, extension rings shall be installed so that the plaster ring is flush with the finished surface.
- 3.4 All cabinets and boxes shall be secured by means of toggle bolts on hollow masonry; expansion shields and machine screws or standard precast inserts on concrete or solid masonry; machine screws or bolts on metal surfaces and wood screws on wood construction. All wall and ceiling mounted outlet boxes shall be supported by bar supports extending from the studs or channels on either side of the box. Boxes mounted on drywall or plaster shall be secured to wall studs or adequate internal structure.
- 3.5 Boxes with unused punched-out openings shall have the openings filled with factory-made knockout seals.
- 3.6 Where standby power and normal power are to be located in the same outlet box or 480V in a switch box, install partition barriers to separate the various systems.
- 3.7 All device boxes and junction boxes for fire alarm system shall be painted red and shall be 4-11/16" square by 2-1/8" deep. No exceptions.

END OF SECTION

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SECTION 26 0543
UNDERGROUND PULL BOXES AND MANHOLES

PART 1 – GENERAL

- 1.1 Furnish and install electrical underground pullboxes and manholes as specified and as shown on the electrical drawings.
- 1.2 Submit manufacturer's data for all items.
- 1.3 **Common submittal mistakes which will result in the submittals being rejected:**
 - 1.3.1 Not including all items listed in the above itemized description.
 - 1.3.2 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.3.3 Not including actual manufacturer's catalog information of proposed products.
 - 1.3.4 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

- 2.1 The concrete for pull boxes and manholes shall be class 5500 psi or as noted on the drawings. All pullboxes and manholes and covers located in parking lots, driveways, roads, or any other driveable areas shall be traffic rated.
- 2.2 Each manhole shall be provided with a fiberglass ladder and ground rod. Ground rods shall be copper or a copper-clad steel 3/4" diameter by 10-feet long. All non-current carrying metallic components shall be grounded to the ground rods with minimum #6 copper wire.
- 2.3 All underground pullboxes shall be provided with steel bolt down type covers. Bolts shall be bronze or brass. All communication or signal system pullboxes shall be sized to comply with CEC Article 370 unless where other sizes are specifically noted on the drawings.
- 2.4 All underground pullbox and manhole covers shall be provided with either "electrical" or "telephone" or "fire alarm" markings. The telephone marking shall be used to identify telephone, T.V., clock or any other types of communication systems.
- 2.5 All power and communication systems shall be provided with separate pullboxes or manholes. Fire alarm circuits shall also be provided with separate pullboxes from any other type of communication systems.

PART 3 – INSTALLATION

- 3.1 Shoring of the excavation shall be in accordance with all federal, state and local regulations.
- 3.2 Provide sealing material for the joints between sections per manufacturer's instructions.

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- 3.3 The contractor shall make the top and access assembly or lid flush with surrounding areas where installed in drivable or normal walking areas.

END OF SECTION

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SECTION 26 2416
PANEL BOARDS

PART 1 – GENERAL

- 1.1 Furnish and install branch circuit panel boards as specified herein and as indicated on the drawings. Submit manufacturers' data on all items.
- 1.2 Submit manufacturers' data on all panel boards and components including:
 - 1.2.1 Enclosures and covers
 - 1.2.2 Breakers
 - 1.2.3 Surge Protective Device (SPD) equipment
 - 1.2.4 Incident energy level calculations
 - 1.2.5 Common submittal mistakes which will result in the submittals being rejected:
 - 1.2.5.1 Not arranging the circuit breakers in panels to match the orientations indicated on the drawings. In other words, if a 30 amp breaker is shown on the drawing in Space #2, this must be the location it appears on the submittal schedule. Standard factory arrangements will not be accepted.
 - 1.2.5.2 Not including all items listed in the above itemized description.
 - 1.2.5.3 Including catalog cut sheets which have several items on a page, and not clearly identifying by highlighting, underlining or clouding the items to be reviewed, or crossing out the items which are not applicable.
 - 1.2.5.4 Not including actual manufacturer's catalog information of proposed products.
 - 1.2.5.5 Do not include multiple manufacturers for similar products and do not indicate "or approved equal" statements or "to be determined later" statements. The products being submitted must be the products installed.

PART 2 – PRODUCTS

- 2.1 The interrupting rating of circuit breakers shall be 10,000 amps for the 120/208 system and 14,000 amp for 277/480 volt systems. Refer to drawings for higher interrupting rating requirements. All components and equipment enclosures shall be manufactured by the same manufacturer. Circuit breakers shall be permitted to be series rated to limit the available fault current to no more than the above ratings.
- 2.2 All panels shall be fully bussed. Recessed panel enclosures shall be a maximum of 20" wide and 5-3/4" deep for all panels 600 amp rated and less.
- 2.3 All busses shall be copper and shall be located in the rear of the panelboard cabinet. Individual circuit breakers shall be bolt on type and removable from the cabinet without disturbing the bussing in any way. All panel boards shall contain ground busses.

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- 2.4 Panel covers shall be door in door style, with one lock. Door lock shall allow access to breakers only. Access to wireways without removal of cover shall be permitted by (non removable) screws behind the locked door. Panel cover shall be provided with full length piano hinge. All locks for all panels provided in this project shall be keyed alike.
- 2.5 Each panel shall have a two-column circuit index card set under glass or glass equivalent on the inside of the door. Each circuit shall be identified as to use and room or area. Areas shall be designated by room numbers. Room numbers shown on the drawings may change and contractor shall verify final room numbers with the architect prior to project completion.
- 2.6 Tandem mounted or wafer type breakers are not acceptable.
- 2.7 Multiple breakers shall have one common trip handle or be internally connected. Handle ties are not acceptable.
- 2.8 Breaker arrangements shown in the drawings shall be maintained. The circuit breakers in panels must match the orientations indicated on the drawings. In other words, if a 30 amp breaker is shown on the drawing in Space #2, this must be the location it appears on the submittal schedule. Standard factory arrangements will not be accepted.
- 2.9 Circuit breakers for a multi-wire branch circuit shall be tied together with a factory breaker handle tie.
- 2.10 Where conductor sizes exceed the standard breaker lug wire range, or where multiple conductors per phase are required, the panelboard manufacturer shall provide the breaker with suitable lugs for terminating the specified conductors.
- 2.11 Acceptable manufacturers are Eaton, Siemens or General Electric.
- 2.12 Equipment manufactured by any other manufacturers not specifically listed in Section 2.10 are not considered equal, or approved for use on this project.

Surge Protective Device (SPD)

- 2.13 Surge Protective Device (SPD) panelboards, shall be provided with an integrated circuit breaker panelboard and parallel connected suppression / filter system in a single enclosure. The SPD panelboard shall meet the following parameters: IEEE C62.41.1, IEEE C62.41.2, IEEE C62.45, UL 1283 and the UL 1449, Third Edition, effective September 29, 2009.
- 2.14 The panelboard shall be UL 67 Listed and the SPD shall be UL 1449 labeled as Type 1 or Type 2 or as Type 4 intended for Type 1 or Type 2 applications. SPD shall be factory installed integral to the panel board.
- 2.15 The SPD panelboard shall be top or bottom feed according to requirements. A circuit directory shall be located inside the door.
- 2.16 SPD shall meet or exceed the following criteria:
 - 2.16.1 For standard areas supply SPD having 100kA per phase surge current capacity. For mountain and desert areas (areas with over 5 lightning strikes per year), SPD shall have a per phase surge current capacity of 200kA.

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2.16.2 UL 1449 – Third Edition Revision; effective September 29, 2009, Voltage Protection Ratings shall not exceed the following:

<u>VOLTAGE</u>	<u>L-N</u>	<u>L-G</u>	<u>N-G</u>	<u>L-L</u>	<u>MCOV</u>
208Y/120	700V	700V	700V	1200V	150V
480Y/277	1200V	1200V	1200V	2000V	320V

2.16.3 SPD shall be UL labeled with 100kA Short Circuit Current Rating (SCCR).

2.17 UL 1449 - Third Edition Revision; effective September 29, 2009, Voltage Protection Ratings shall not exceed the following:

<u>VOLTAGE</u>	<u>L-N</u>	<u>L-G</u>	<u>N-G</u>	<u>L-L</u>	<u>MCOV</u>
208Y/120	700V	700V	700V	1200V	150V
480Y/277	1200V	1200V	1200V	2000V	320V

2.18 SPD shall be UL labeled with a minimum 100kVA short circuit rated (SCCR).

2.19 UL 1449 Listed Maximum Continuous Operating Voltage (MCOV) (verifiable at UL.com):

<u>System Voltage</u>	<u>Allowable System Voltage Fluctuation (%)</u>	<u>MCOV</u>
208Y/120	25%	150V
480Y/277	15%	320V

2.20 SPD shall incorporate a UL 1283 listed EMI/RFI filter with minimum attenuation of - 50dB at 100 kHz. No filtering is required for a 100kA SPD.

2.21 Suppression components shall be heavy duty 'large block' MOVs, each exceeding 30mm diameter.

2.22 Type 4 SPD shall include a serviceable, replaceable module.

2.23 SPD shall be equipped with the following diagnostics:

2.23.1 Visual LED diagnostics including a minimum of one green LED indicator per phase, and one red service LED.

2.23.2 No other test equipment shall be required for SPD monitoring or testing before or after installation.

2.24 SPD shall have a response time no greater than 1/2 nanosecond

2.25 SPD shall have a 10 year warranty

2.26 The SPD panelboard shall have removable interior

2.27 The SPD panelboard main bus shall be aluminum and rated for the load current required

2.28 The SPD panelboard shall include a 200% rated neutral assembly with copper neutral bus

2.29 The unit shall be provided with a safety ground bus

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(SPD) Quality Assurance

- 2.30 Manufacturer Qualifications: Engage a firm with at least 5 years experience in manufacturing transient voltage surge suppressors.
- 2.31 Manufacturer shall be ISO 9001 or 9002 certified.
- 2.32 The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of ten (10) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.
- 2.33 The SPD shall be compliant with the Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC.

Short-Circuit and Coordination Studies

- 2.34 The contractor shall provide the following studies; a time current and complete short-circuit study, equipment-interrupting or withstand evaluation, and a protective-device coordination study as described below for the distribution system. The equipment study shall be included with the equipment submittals. The studies shall include all portions of the electrical distribution system from the normal and alternate sources of power throughout the low-voltage distribution system. Normal system operating method, alternate operation, and operations which could result in maximum-fault conditions shall be thoroughly covered in the study. The studies are to be reviewed by a Professional Engineer registered in the State of California.
 - 2.34.1 **All studies shall be performed by “Emerson Electric” (858) 695-9551, MTA (858) 472-0193, or Terra Power Solutions (858) 380-8170. Studies performed by manufactures or other engineering or testing companies must submit qualifications for approval by Johnson Consulting Engineers, 7 days prior to bid for this project.**
- 2.35 Short-Circuit Study
 - 2.35.1 The study shall be in accordance with applicable ANSI and IEEE standards.
 - 2.35.2 The study input data shall include the short-circuit single- and three-phase contributions from all sources, with the X/R ratio, the resistance and reactance components of each branch impedance, motor and generator contributions, base quantities selected, and all other applicable circuit parameters.
 - 2.35.3 Short-circuit momentary duties and interrupting duties shall be calculated on the basis of maximum available fault current at each switchgear bus, switchboard, motor control center, distribution panelboard, pertinent branch circuit panelboards, and other significant locations through the system.
 - 2.35.4 For the portions of a system utilizing medium- and high-voltage breakers, separate calculations shall be made for one-half cycle (close and latch) currents and interrupting currents. Calculations shall be for three-phase and phase-to-ground faults at each bus under consideration.
 - 2.35.5 For the portions of a system utilizing low-voltage breakers (less than 1,000 volts), calculations shall be made for three-phase and phase-to-ground interrupting currents at each bus under consideration.

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2.36 Equipment Evaluation Study

- 2.36.1 An equipment evaluation study shall be performed to assure the adequacy of circuit breakers, controllers, surge arresters, busways, switches, and fuses by tabulating and comparing the short-circuit ratings of these devices with the maximum short-circuit momentary and interrupting duties. Series rating of over current protective devices shall be permitted to reduce the maximum available short circuit current to panelboard branch circuit breakers to no more than 10,000 amps symmetrical for the 120/208 volt system and 14,000 amps symmetrical for the 277/480 volt system.

2.37 Protective-Device Coordination Study

- 2.37.1 A protective-device coordination study shall be performed to select or to verify the selection of power fuse ratings, protective-relay characteristics and settings, ratios, and characteristics of associated voltage and current transformers, and low-voltage breaker trip characteristics and settings. Time current curves are to be colored to clearly indicate coordination.
- 2.37.2 The coordination study shall include all voltage classes of equipment from the source's incoming line protective device down to and including each motor control center and/or panelboard. The phase and ground over current protection shall be included as well as settings for all other adjustable protective devices. Ground fault settings are to, as a minimum coordinate with a downstream 50 amp branch circuit breaker.
- 2.37.3 Protective device selection and settings shall be in accordance with requirements of the National Electrical Code and the recommendations of the ANSI/IEEE Standard 399, as applicable.

2.38 Study Report

- 2.38.1 The results of the power-system studies shall be summarized in a final report. The report shall include the following sections:
- 2.38.1.1 Description, purpose, basis, and scope of the study and a single-line diagram of the portion of the power system which is included within the scope of study.
- 2.38.1.2 Tabulations of circuit breaker, fuse, and other equipment ratings versus calculated short-circuit duties and commentary regarding same.
- 2.38.1.3 Protective device coordination curves, with commentary.
- 2.38.1.4 The selection and settings of the protective devices shall be provided separately in a tabulated form listing circuit identification, IEEE device number, current transformer ratios, manufacturer, type, range of adjustment, and recommended settings. A tabulation of the recommended power fuse selection shall be provided for all fuses in the system.
- 2.38.1.5 Fault-current tabulations including a definition of terms and a guide for interpretation.

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2.38.1.6 The report must be submitted with the material submittal for the engineers approval.

2.39 Implementation

2.39.1 The contractor shall be responsible for providing over current devices which are in compliance with the results of the above study.

PART 3 – EXECUTION

3.1 Painting of panelboard covers in finished areas shall be done by the general contractor.

3.2 Provide a spare 3/4" conduit stubbed to an accessible area for each of every three (3) spares or spaces provided in recessed panel boards.

3.3 All lugs shall be torque tested in the presence of the inspector of record.

Arc Flash and Shock Hazard

3.4 The Contractor is to provide, and submit to the engineer for approval, incident energy level calculations as determined using the methodologies described in NFPA 70E or IEEE standard 1584-2002.

3.4.1 **All studies shall be performed by “Emerson Electric” (858) 695-9551, MTA (858) 472-0193, or Terra Power Solutions (858) 380-8170. Studies performed by manufactures or other engineering or testing companies must submit qualifications for approval by Johnson Consulting Engineers, 7 days prior to bid for this project.**

3.5 A warning label, as specified in the above standard, shall be placed on each switchboard, panelboard, and safety switch indicating the incident energy levels on the equipment to warn qualified personnel in accordance with NFPA 70E, section 110.16 Labels shall be laminated white micarta with black lettering on each. Letters shall be no less than 3/8" high.

3.6 The incident level calculations for each piece of equipment shall be given to the owner and maintained on file by the maintenance department

3.7 The design goal is to minimize the incident energy to which a maintenance employee may be exposed.

END OF SECTION

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**SECTION 26 9090
ELECTRICAL CLOSEOUT**

PART 1 – GENERAL

- 1.1 Upon completion of the electrical work, the entire installation shall be tested by the Contractor, and demonstrated to be operating satisfactorily to the Architect, Engineer, Inspector and Owner.
- 1.2 All testing and corrections shall be made prior to demonstration of operation to the Architect, Engineer, Inspector and Owner.
- 1.3 In addition to the demonstration of operation, the Contractor is also required to review the content and quality of instructions provided on items demonstrated with the Architect, Engineer, Inspector and Owner.

PART 2 – EXECUTION

- 2.1 Wiring shall be tested for continuity, short circuits and/or accidental grounds. All systems shall be entirely free from “grounds,” “short circuits,” and any or all defects.
- 2.2 Motors shall be operating in proper rotations, and control devices functioning properly. Check all motor controllers to determine that properly sized overload devices are installed, and all other electrical equipment for proper operation.
- 2.3 Tests and adjustments shall be made prior to acceptance of the electrical installation by the Architect, and a certificate of inspection and acceptance of the electrical installation by local inspection authorities shall be provided.
- 2.4 All equipment or wiring provided which tests prove to be defective or operating improperly shall be corrected or replaced promptly, at no additional cost to the Owner.
- 2.5 Test all motor and feeder circuits with a “megger” tester to determine that insulation values conform to Section 110-20, California Electrical Code (CEC). Test reports must be submitted and approved by the engineer before final acceptance.
- 2.6 Test all grounding electrode connections to assure a resistance of no more than 10 ohms is achieved. Augment grounding until the ohmic value stated above is achieved. Provide certified test results to the Architect, Engineer and Inspector.

END OF SECTION

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